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Professor Rating and Comment System

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Abstract

Students frequently choose their classes based on their peers' opinions of the professors teaching them. These opinions are usually in the form of anecdotes and descriptions rather than numerical data, and can be collected as text in a central system for public viewing. This project examines the validity and usefulness of this textual information on a variety of such systems. The results are used for the creation of an online system that offers the most effective dissemination of the information.

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1. Introduction

In today's colleges and universities, the role of the professor has an enormous effect on the educational experiences of students. Professors are usually given significant flexibility in how they run their classes. This is an advantageous approach; professors, generally speaking, are the ones who know their course material the best. As a result, they are in the right position to decide how to best present the material to students and evaluate their performance in the class. In addition, this allows the students flexibility that might not be immediately obvious, due to rigid standards of university policies and accreditation boards. Specifically, courses can be run very differently from professor to professor, and while one approach in a given course might not be suited to a specific student, another approach could be.

It is important for students to know the individual strengths and weakness of professors, as well as variations in teaching styles, as they relate to different courses. However, students have no effective or formalized method for getting this information. Commonly, students only hear detailed information about professors via word-of-mouth, which lends itself to several problems. For example, a student might hear from a friend that a given professor isn't very good. That student will most likely avoid classes taught by that professor. However, that decision is based only on the friend's experiences, and the professor's teaching style might actually be well-suited to the student. For example, the professor might conduct very informal lectures, which the student prefers; his friend, however, likes structured lectures. Alternatively, the professor could base grades in a course mostly on exams; the student might like this approach, but his friend wants the grade to include homeworks and projects. Also, a student might hear from several friends in the same class that a professor is sub-par, and again decide to avoid the professor. While this is based on the experiences of several students, it may be a result of the professor's

ability in one particular class. Perhaps the material in that class is not the professor's strong suit, or the class material itself is difficult to teach. Again, the student does not have enough information to make a good decision.

1.1 Solutions

In order to make an informed decision when selecting professors, a student will need information from several sources, such as many different students. If the opinions of many students were consolidated into a single source, the problem would be alleviated. Some universities and independent organizations have implemented systems that collect and distribute this information. These systems vary in philosophy and implementation.

One type of system uses a survey of students at a given university to collect information about their opinions and experiences with professors. This information is then used to write articles about each professor (or each class, in some cases), which are compiled and made available in either printed form or on a Web site. This method lends itself to high information content, but the inherent potential for censorship might limit the usefulness of the results.

Another type of system allows students to make their opinions and experiences directly available to others, without an intermediate step. This is usually done in the form of a Web site, since the electronic format allows for automation of the collection and distribution process. This data supplied by this method more closely correlates to the information gained by asking fellow students their opinions. However, because the information is not filtered before it becomes available, its ratio of useful to impertinent content could be high. There is also the potential for libelous comments, which in turn raises the question of who is responsible for information in the system.

University administrations often conduct evaluations of their faculty via student surveys, usually taken during or at the end of a course. These are often in the form of numerical questions, such as evaluating an aspect of a professor's teaching on a scale of one to five or one to ten, plus space for written comments. This information is used when a professor is considered for a promotion, tenure, a pay raise, and so forth. Occasionally this information is made public, but it does not equal the information supplied by student-oriented comment systems. The numerical data do not provide details or justification, and the questions may not cover all areas of interest. In addition, written comments, which do provide details and justification, are generally not made available for public viewing. Either way, students complete these evaluations with a different audience in mind. They will be written with the intention of improving an aspect of the professor's teaching style, not providing information about all the upsides and downsides of the style.

Although professor evaluation systems oriented toward students are valuable and coming into popular use, little research has been done on their qualities. There does exist a body of research, in various forms, on the evaluation systems meant for university administration discussed above, some of which is applicable to this area. We examined pertinent reports and publications; this report discusses their findings. In addition, we analyzed existing professor evaluation systems currently in use. Once this was done, we created a new system, called the Professor Rating and Comment System (PRACS). This is an online system, available to WPI students, which improves upon the existing systems and takes into account the findings of the research.

2. Goals

The goals of this project are as follows:

1. Examine the current state of professor rating and comment systems and identify strong points and shortcomings present within those in use
2. Create a new system that meets the needs of students and improves upon previous efforts
3. Analyze the usage of the existing system and new system in a quantitative manner and compare the results

3. Methodology

Our first task was to locate research on the topic of professor rating and comment systems, and existing systems from which we could collect data. The first half of this task was simplified somewhat by WPI's faculty Committee on Academic Policy. This committee is charged with making recommendations with regards to the policies that affect the direction and goals of undergraduates at the university. In the summer of 2002, it examined the current state of course evaluations at the university. In a report it released on the subject, it addressed the issue of student comments and their usefulness, in addition to providing an extensive bibliography (Hansen, 13). Both the report itself and works from the bibliography provided important background information.

A search of the World-Wide Web turned up several rating and comment systems in use, in both electronic and paper formats. We made note of the pertinent ones so that we could return to them and evaluate them later. The most useful one, located at RateMyProfessors.com, was actually discovered well after the others, while the project was underway. Other systems were discovered that were apparently never used, as they contained almost no or no ratings or comments.

PRACS, our new system, drew upon our existing knowledge of Web programming, database systems, and interface design. It follows a format common to many interactive Web-based systems. The specifics of the comment formats were determined according to our evaluation of the research and existing systems. After the system was complete, we distributed flyers around the WPI campus and posted messages to college newsgroups in order to make it known to the student body.

Once students posted comments to PRACS, we performed a comparative analysis of all the systems. We visited each system, including our own, and rated each comment according to a pre-defined quantitative scale, using “rubrics” and factual questions as the basis for a numerical score. We then wrote a script in Perl (Practical Extraction and Report Language, a popular scripting tool) to summarize and analyze this raw data, which made easy the task of examining the findings and creating graphs.

4. Background Research

4.1 CAP Document

WPI's own Committee on Academic Policy has investigated issues surrounding to online evaluation systems, and evaluation systems based on student input (Hansen, 1). We have identified several statements in the report pertinent to the type of system we hope to create. According to the report, a Web-based course evaluation system suffers from "low response rates and concerns about anonymity." Both of these issues are concerns for our system, and we will have to address them.

Regarding low response rates, students will need motivation to enter comments into the system. As a result, the entry format will have to be as simple as possible, so that entering comments will appear to be an easy task, and not at all time-consuming. In addition, we hope that students will be motivated by the desire to improve the learning experience of other students by supplying useful information about professors. In administration-sponsored course evaluation system, students may never see the results of the evaluation, whereas in our system, the results will be publicly available.

Concerns about anonymity can be eliminated if anonymous submission of comments is allowed. If submissions are anonymous, however, there is no way to determine if a student is leaving multiple comments about the same professor to give the impression that his/her opinion is widespread. Likewise, there is no way to determine if a comment was left by a student at all. For example, a professor might leave one or more positive comments about himself/herself to sway student opinion. It is clear that if an anonymous system is implemented, there still must be some method of identifying users.

The report also brings up the concern of the scientific validity of course evaluations. Specifically, because subjective “psychological phenomena” such as perceptions, opinions, and reactions are the source of the evaluations, it is difficult, but still necessary, to ensure that the evaluations meet rigorous standards of accuracy, reliability, and validity. Fortunately, our system is not meant for quantitative evaluations, and subjectivity is not necessarily a problem. If several students contribute evaluations of a given professor, and the evaluations are clearly marked as the efforts of several different authors, readers will know they may be biased or opinionated.

4.2 Arizona Document

A paper published by professors at the University of Arizona identifies the specific problems associated with publicizing written comments from course evaluations (Franklin, 1). The first problem discussed in the report is validity; comments cannot be verified as being correct information. Unfortunately, this is a drawback of any survey-style information gathering method. The data is only as valid as the respondents wish it to be. In the case of written comments, any reason for students to supply incorrect information must be removed. The primary reason is fear of retribution; students will not want to write any negative things if they expect punishment. As a result, care must be taken to keep students’ identities confidential, possibly by not even recording the identities of students at all. This is corroborated by the CAP document, discussed in the previous section.

Another problem identified by the report involves statistical anomalies with regards to which students write comments. According to the document, comments usually come from students who have especially strong opinions, either positive or negative. Without neutral or less opinionated students to balance things out, the comments may give a skewed image of the professor in question. In addition, free-form comments will vary widely in content and

usefulness. Some students will write in detail about specific topics, and others will write short pieces about more general things. This part of the document supports the position that it must be clear to the reader that evaluations are subjective. At the very least, the comments should not be portrayed as giving the complete story in any situation.

The report also mentions that the writing of students will often be open to different interpretations. Comments might be understood in different ways by comment authors, professors, and readers. We believe is an issue with any written material, however. Different words have different meanings and connotations to different people; the nature of language makes this unavoidable. It is possible for a neutral party to re-write comments to potentially remove any ambiguous meanings, but that neutral party might introduce new problems into the writing. As a result, it might be preferable to restrict re-writes to those comments that cause significant conflict or problems, possibly by the original authors themselves. Because existing systems take both approaches, we will be able to examine their advantages and disadvantages.

4.3 Developing a Comprehensive Faculty Evaluation System

Dr. Raoul A. Arreola is a respected authority in the field of professor evaluation systems, and has served as a consultant at many universities. Among his publications is a book that specifically deals with the development of a faculty evaluation system. While the book mostly discusses topics pertinent to a university administration, it has one chapter on the validity of student evaluation of professors (Arreola, 79). This information is helpful in determining the validity of a system such as the one we created.

The first issue Dr. Arreola addresses pertinent to our project is the reliability and accuracy of student evaluations of professors in general. He first poses the question, asked by a

hypothetical faculty member, “Aren’t student rating forms just plain unreliable and wrong?” Fourteen studies are examined to answer this question, which come to the conclusion that student evaluation of professors correlate with other evaluations (such as administration or peer examination) in the majority of cases. While college teaching is a complex task, it is not beyond the abilities of students to judge.

The next applicable question addressed is whether or not student evaluations are too haphazard to contain consistently meaningful data. Although the author is somewhat vague in presenting his results, seven studies are referenced that conclude that students are consistent across different class years and professors in evaluations. Thus, ratings and comments are not significantly influenced by maturity or emotional factors, if Dr. Arreola is correct.

The question is posed as to whether good grades will elicit better evaluations. This is especially applicable to our project, as an independent professor rating and comment system allows students to evaluate courses after they receive their grades, whereas administration-run surveys are usually conducted shortly before or shortly after a course, before grades are available. Fortunately, twenty-four studies have shown that there is no correlation between grades and professor evaluations. Dr. Arreola even discusses one study that did show a correlation, but was determined to be invalid upon closer examination; he believes it was conducted with the intention of discrediting student evaluations.

One issue is raised with regards to whether or not mathematics and science professors tend to receive lower ratings and more negative comments than those in the humanities. Interestingly, studies have shown that this is often true. Because WPI is focused on mathematics and the sciences, the system we create may tend toward negative ratings, or at least less

enthusiastically positive ones. This could also be the case for other technology-oriented programs.

Finally, the author discusses the correlation between professor evaluations and the amount of time that has passed since a student has completed a course. This is pertinent to our project since a system such as the one we created allows a student to evaluate a professor at any time, even years after he/she has taken a given course. Dr. Arreola notes that research in this area is difficult, due to the anonymity of student evaluations, and the difficulty in coercing alumni into participating in this kind of research. Luckily, five studies have been undertaken on this matter, and their results indicate that the time-frame an evaluation is made is not relevant with regards to its content.

5. Existing Systems

The limited research conducted on student evaluation of professors is helpful in supplying general information on how well a student-oriented professor rating and comment system would work. However, not all the specifics of the research documents are applicable to this project, because their analysis was conducted on only administration-oriented systems, not student-oriented ones meant solely for students to read and not intended to determine things like tenure or pay raises. Fortunately, there are some existing professor rating and comment systems in use. Analysis of their student-written evaluations is a valuable source of data. In addition, they provide inspiration for new systems, such as the one we created, and also demonstrate shortcomings that are to be avoided. We found two popular systems that operate as a periodical publication, with summaries of student surveys, and two heavily-used Web-based systems; an equal mix should provide balanced data. The following is a brief description of each system, to help understand the results of our upcoming analysis.

5.1 Underground Guide to Course VI (MIT)

The Massachusetts Institute of Technology's chapter of Eta Kappa Nu (an electrical engineering honor society) publishes a booklet every semester called the *Underground Guide to Course VI*. It contains information about each course in the Electrical Engineering and Computer Science department and the professors that teach them. Information is collected by a survey of students who took classes in the department the previous term. The survey asks for both numerical ratings and written comments, which are summarized (and in some cases quoted) in the publication.

Each course is allocated one to two pages in the booklet. Some factual information is included, such as course number and pre-requisites. A description of the course written by its

professor is also included, possibly to provide an “official” perspective. Then follows a short description of the course content, in various levels in detail, and a listing of which majors and levels of student take the course. After that is a paragraph each evaluating the professor and his teaching assistants, then a summary of the students’ opinions of the assignments and tests. The last item is a brief listing of the “what’s hot” and “what’s not” details of the course, and selected quotations from the surveys.

The entries in the *Underground Guide to Course VI* are well-written and professional-quality. Because the publication is associated with the honor society, the articles are not written to take a stance on which professors are “good” or “bad,” although this is sometimes implicit in the details related by the text. Also, because the entries are summaries, we found that they omit specific details or facts, often to the point where the professor comments are too vague to convey any conclusive data to the reader. Specific topics other than assignments and tests are not necessarily covered at all.

5.2 The Critical Review (Brown University)

The Critical Review (http://www.brown.edu/Students/Critical_Review/) is a school-sanctioned, student-run online catalog for Brown University that contains reviews of most courses that the school offers. The reviews are written based on the feedback of students that had taken the course.

To begin, the user selects a semester to read course reviews for. All the courses that the school offered in that semester are listed (along with the professor(s) that taught them), categorized by department. When a course is selected from the list, information in addition to the review of that course is displayed, including the professor, course format, number of survey

respondents (the input of whom was used to construct the review), total enrollment in the course, and a breakdown of the students in the course into their class years.

Also included is the numeric data from survey respondents, which is represented as the percentage of students in the class that "strongly agreed", "agreed", "disagreed", and "strongly disagreed" with various statements. For "Instructor," these are "Explicitly [sic] set out goals," "Sensitive to individual needs," "Organized class time well," and "Motivated you to succeed." For "Content," these are "Assigned readings worthwhile," "Lecture/discussion worthwhile," and "Materials/activities worthwhile." For "Structure," they are "Exams/assignments relevant," "Grading policy clear and fair," and "Feedback on work useful." For Skills, the statements are "Challenged intellectual ability," "Accomplished course goals," "Apply new principles elsewhere," and "I loved this course."

Each review is composed of four paragraphs. The first describes the intended content of the course in much the same way that it would be described in a course catalog. The second paragraph describes the students' impression of the professor. The third paragraph describes the general layout of the class, such as how the lectures were structured, the course web site, and the tests and homework. Finally, the fourth paragraph details whether the course met students' expectations, as well as their impression of the difficulty of the course. More details are possible in this setup than in the *Underground Guide to Course VI*, although generalizations are still necessary to condense the opinions of many students into a short article.

5.3 AroundU.com (Louisiana State University)

LSU's professor rating site (<http://old.universitytools.com/utools/ratings>) is actually a subsection of the AroundU.com/UniversityTools.com site; AroundU.com is an independent company located in Baton Rouge, Louisiana.

From the front page, users are given the option to select one of four main sections: "Add Your Ratings", "List by Course", "List Instructors by Name", and "How does your department stack up?" Listed on the right-hand side are the top ten instructors and top ten courses, ranked by percentage.

Selecting "Add Your Ratings" will prompt the user to log in if he or she has not done so already. An account at UniversityTools.com is free and it is not required that the user be a student at LSU.

After selecting "Add Your Ratings", the user is asked to select the department, course, and professor for which the ratings will be left. Ratings are in the form of a letter grade (A through F), and apply to the follow categories: Communications Skills, Personality, Course Content, Exams and Grading, and Amount of Outside Time Required (where an "F" is presumably an inappropriate amount of time relative to the course content). Also collected is information regarding whether both the professor and class would be recommended to other students. Information that may optionally be entered is the grade that the user received in the class and a text field that the user can use to enter a single sentence or phrase that describes the experience of the class. Because the text field is short, and optional, evaluations do not necessarily include concrete details to back themselves up.

The "List by Course" and "List Instructors by Name" options will both ultimately present the user with a page of ratings for a particular professor. The user is not required to log in before reading ratings. Ratings are broken down such that the number of every letter grade for every category is displayed, as well as the average.

"How does your department stack up?" simply averages all the professor ratings for every department, and ranks the departments by quality. The user can also choose to rank departments based on course (rather than professor) ratings.

5.4 RateMyProfessors.com

RateMyProfessors, an independent company, hosts a free professor-rating service for most instructors at most major colleges and universities. After selecting a school, the professors for that school are displayed in a list, which can be ordered by professor name, department, date the professor was last rated, number of total ratings, and overall quality.

Clicking on a professor's page brings the user to a list of all the comments for that professor. The comments themselves are contained in text areas. To the left of this, three columns contain numeric values that represent, respectively: Easiness, Helpfulness, and Clarity. Each of those three attributes is assigned an integer value between 1 and 5, inclusive. To calculate the overall "quality" of a professor, all the values for Helpfulness and Clarity for every comment are averaged, and one of three smiley-face graphics is selected based on preset threshold levels that class the professor as being Good, Average, or Poor. Note that the Easiness of a professor does *not* affect the professor's overall rating. Also, there is a binary-state attribute of every professor that is referred to as "Hot." A professor's entry in the list will be accompanied by an icon of a chili pepper if at least 50 percent of comments that were left indicated that the professor in question was 'hot'. There are also other miscellaneous fields in the comment form such as the course number that the comment applies to, the current status of the professor (teaching vs. retired/gone), and the number of students that dropped the course.

The freeform comments may contain any non-libelous information about the professor or an experience one has had with the professor teaching a course. Unlike AroundU.com,

unacceptable comments can be submitted to an anonymous moderator for review, and possibly removed. As of this writing, the maximum length of these comments is 255 characters, which limits the amount of useful content a comment can contain.

RateMyProfessors.com also offers a 'gold' membership account. This comes at a cost of \$6.95 per year and offers features like advanced search capability and the ability to view all the comments. Browsing the site as a non-member, a user can only view the 10 most recent comments for any professor. The gold account is also free of advertising.

6. Professor Rating and Comment System

6.1 Description

The system we created, PRACS (<http://www.acm.wpi.edu/~pracs/>), is intended only for use by WPI students, and only to comment on WPI professors. The WPI gray-and-maroon color scheme was used for all the pages on the PRACS site. Upon arriving at the site, the user is presented with an informational page explaining the nature of the PRACS system, its reason for existing, its affiliation (or lack thereof) with the WPI administration, and the names of the students responsible for maintaining it (along with contact information to reach them). Credit is also given here to the Association for Computing Machinery, for that organization's willingness to host the system. (See Appendix A.)

The first functional page on the PRACS system prompts the user to select a department for which he or she will be evaluating professors. After a department has been selected, a list of professors is displayed, along with the current number of comments for each. The user can, at this point, either elect to be shown the current comments for a professor, or enter the name of a professor that does not currently exist in the system. User-entered names are not automatically added, but rather are mailed to the site administrator for manual entry.

When viewing comments for a particular professor, a button at the top of the page allows the user to add his or her own comments. A username and password are required to enter a comment, and a signup form is available in a popup window at the user's request. Information collected from the user while signing up includes their major, class year, and how the PRACS system came to their attention. Below the 'comments' field in the comment-submission form, the criteria/questions for writing a useful comment are listed. At the bottom of a professor's page of comments, another button allows the user to select another professor in the same department.

At the top of any page in the system, links are available to take the user to the department-selection page, the informational introduction page, a signup form, and a form that can be used to report a problem. Any problems reported are mailed to the site administrator.

The code for the system is written in Perl, a popular scripting language. The data is stored on a WPI system running MySQL, which is a versatile database server. The database is made up of four segments, or "tables." The access table stores the number of accesses to the system per IP (Internet Protocol) address; the comments table contains the bodies of the actual comments themselves; the professors table connects the full names of all professors, their three-letter initial code, and their two-letter department code; and the users database contains the username, password, major, class year, and signup date and time for each user.

6.2 Justification

During the design of PRACS, several decisions had to be made about the functionality of the system. Some were decided from the start of the project, but most were made after examining the research and existing systems. One decision made right away was to implement PRACS as a Web-based system. This allows students to submit comments from any computer connected to the Internet, and make the comments available right away. This provides motivation to comment authors, as they do not have to wait to see the results of writing a comment.

Despite the name, "Professor Rating And Comment System," we chose to omit numerical ratings from our system. None of the systems we examined has a satisfactory rating system, which is not surprising. A thorough rating of all aspects of a professor's teaching would require a long questionnaire asking the student to assign a score to each one, much like on a university administration's course evaluation. However, a student on a Web form will not want to spend several minutes clicking radio buttons, much less write comments in addition. However,

including only a small number of numerical values will ultimately be too general and mislead readers. Dr. Raoul Arreola confirms that forms for professor ratings must be designed with care to be of any use (Arreola, 81).

As a result, data entry for PRACS consists solely of a free-form comment entry box. This approach, while simple, meets our objectives for an effective system. Numerical ratings do not provide any details or justification for why a given aspect of teaching is a professor's strong or weak area. Eliminating them still allows a student to praise or criticize anything about a professor. However, because he/she must type this, it is easy to go from stating an opinion to justifying an opinion, since it requires entering just a few more words beyond what he/she has already written. In a combined rating/comment system, it is too easy to enter ratings and write about only one specific detail in the comments, or ignore them completely; this was observed on both such systems we looked at. In addition, we have established that one student's favorite professor might be another student's least favorite professor. As a result, stating whether or not a professor is "good" or "bad" is somewhat counter-productive. If a professor evaluation listing shows even a slight majority in either case, the reader will likely made up his/her mind without thoroughly reading the comments.

The issue of anonymity and authenticating users was a difficult one. Several options presented themselves, with different positive and negative points. The simplest solution would be to allow unrestricted posting, with no authentication whatsoever. This would promote the most comments, as there would be no login process necessary to post. In addition, comment authors would not feel restricted in what they write, for fear of it being traced back to them. However, it would be more inviting to malicious action. For example, it would be easier for "hackers" to post a large number of comments in an effort to disrupt the operation of the PRACS system. There is

also the possibility of a student posting multiple comments about a professor that appear to come from multiple students in an effort to make his/her opinion seem more widespread. A professor could even post positive comments that appear to come from students in his/her own section of the system.

Clearly, some sort of authentication system is necessary. Two opinions were discounted right away. One is to require a comment author to enter his/her name; there is nothing stopping the author from entering an invalid name. Even if the system is linked to a WPI database, the author can simply enter someone else's name. Another possibility is to deny computers not on the WPI network the ability to post comments; However, many students do not live on the WPI campus, and excluding them would limit the usefulness of the system, especially its response rate. Also, while this should solve the "hacker" problem, it does not limit erroneous comments. Students can still post without restriction, and professors would be able to post from their offices on the campus.

One possibility was to use the usernames and passwords of students' accounts on WPI's Unix servers, run by the Computing and Communications Center (CCC). Under this scheme, when posting a comment, a student would enter his/her username and password. This would then be sent directly to a CCC system to authenticate. That system would return to PRACS whether or not the username and password were valid. Thus, we would be ensured that each comment was posted by a student. However, there are still problems with this approach. If we do not record the username of each comment poster, a student can still post multiple comments pretending to be different students. Likewise, the CCC system might not be able to differentiate between student accounts and professor accounts; if so, professors could also post erroneous comments. Alternatively, if we do record the username, students will be concerned about their

accountability and censor what they write. In either case, there is an additional problem of paranoia on the part of the students. A comment author might be suspicious of the channel by which his/her password travels to the CCC. Even if ensured that the method is completely secure, and doesn't result in the PRACS administrators or anyone else gaining access to his/her password, the student still may choose not to post. While it seems excessive, this attitude is common among technically knowledgeable students such as those at WPI, and is a substantial concern, based on our experience and observation of at least one other IQP group.

The final solution, and the one we implemented, involves a localized authentication/login system. When a student wants to post comments, he/she chooses a username and password just for the PRACS system. The username can be anything the student wants; it can reflect his/her real name, or it can be something completely unrelated. Thus, comment authors can choose their level of anonymity. Because a login is required to post, "hackers" cannot easily flood the system with invalid data. This method also discourages multiple erroneous posts by a single student, as the posts will have come from the same username. An especially malicious individual could register for multiple usernames also, but this is an added hassle unless he/she creates an automated system that does this. In addition, several usernames registered within a short time-span will look suspicious to the PRACS administrators. This method does not protect against professors posting positive comments about themselves, although such comments can be detected by other methods. For example, if a professor with multiple negative comments has one very positive comment, that comment stands out and raises suspicion. If the PRACS administrators investigate further and discover that it was written by a user who registered only to post that comment, its validity will be further questioned. It is our hope, however, that most professors are mature enough not to do this in the first place.

On the technical side, we chose to use Perl because it is well-suited to Web-based systems such as ours. In addition, we were already familiar with the language and even had pre-written code that could be transferred to the new system. Also, WPI has a server called `mysql.wpi.edu` that students can use for academic projects such as ours. Since this server runs MySQL, and can be easily accessed by Perl scripts, it was an obvious choice.

6.3 Outcome

During the first three months PRACS was active, twenty-one users posted twenty-eight comments. Thirteen posted one comment, two posted two comments, two posted three comments, one posted five comments, and three posted no comments. One was a Biology/Biotechnology major, one was a Chemistry/Biochemistry major, thirteen were Computer Science Majors, one was an Electrical/Computer Engineering major, one was a Management major, two were Mathematical Sciences majors, and one was a Mechanical Engineering major. Three were class of 2003, ten were class of 2004, four were class of 2005, three were class of 2006, and one was a graduate student. Three heard about the system on the `wpi.students` newsgroup to which we posted, two heard about the system via flyers we posted around the campus, twelve heard about the system via word and mouth, and four heard about the system via a method they did not specify. Interestingly, fourteen of the twenty-one users apparently used their WPI username as their PRACS username, and one apparently even used his full name as his username. For many users, it seems, anonymity is not essential.

A yield of twenty-eight comments is lower than what we hoped. However, upon further investigation, this is a reasonable result. There are 772 comments on WPI professors on RateMyProfessors.com, which has been online since 1999, according to the Web site. 772 comments over the course of four years translates to 3.71 comments per week. Our system

accumulated the twenty-eight comments over the eleven weeks between March 4, 2003 to May 19, 2003. This is a rate of 2.55 comments per week. While this is lower than RateMyProfessors, it is still well within the same order of magnitude. In addition, the comment addition rate of RateMyProfessors appears to have increased since its activation, as most of the observed comments were posted within the last year. Thus, we can expect to see many more comments on the PRACS system in the coming months. Unfortunately, this data will not be available for our project, but could be used in a future project (see Section 8).

Access data was collected for one month of the PRACS system's operation. During this time, forty-four unique computers accessed the system and (presumably) read the comments. This translates to nearly 1.5 unique visitors per day. In addition, all but twelve of these visited the site more than once. Also, users requested that sixteen additional professors be added to the database. This indicates that even if visitors are not always eager to author comments, they do want to read them.

In order to be useful to students, the comments on a system like PRACS must provide information about professors in an effective and comprehensive manner. Specifically, the comments must be well-written, so that their meaning is unambiguous and presented well enough to be taken seriously. They should also have significant content, such that the information they provide is relevant to selecting a professor, and contain enough details so that a reader can understand what may make a professor the right or wrong choice for himself/herself. Finally, they should address the specific topics that are commonly discussed with regards to professor selection, so that a reader can compare different professors according to the same aspects of their teaching styles.

7. Analysis

7.1 Scoring Scheme

In each system, we evaluated every comment based on their style, content, and topics covered; an automated script scored the comments based on the evaluation data. The style and content sections are each composed of three areas, which we assigned a rating from one to five. The scoring script added zero points to the comment score for a rating of one, one point for a rating of two, and so on. While this may seem non-intuitive, it was done so that the minimum score of any comment is zero; this makes scoring consistent with common practices. We defined what kind of comment would be given a one, three, and five in each area; two and four are for cases that lie in between our descriptions. The topics section of our scoring criteria lists questions that a student might address. These are the same questions we ask of comment authors in the PRACS system. Each question covered adds an additional two points to the score. Because the way the comments are written is what we are most interested in, we based the bulk of our scoring on that. An actual topic covered adds points to increase the score of the style or content areas by two, or one level given our one/three/five system. Thus, the topics are a kind of “extra credit” in our scoring system. A comment can thus receive a maximum of 40 points, but a score of 24 is considered a “perfect” comment, since it is equivalent to have been rated a five in the style and content areas.

For style, the areas are maturity, spelling and grammar, and attitude/tone. For maturity, a comment that contains no instances of vulgarity or personal attacks receives a five; one with one or two instances of mild vulgarity or character criticism gets a three, and one with much vulgarity or severe personal attacks gets a one. Comments with perfect spelling and grammar get a five in that area; those with a few minor or one or two major errors are given a three, and those

with numerous severe spelling or grammar areas receive a one. As for attitude/tone, a comment written in a neutral manner is awarded a five, a comment with some indication of polarization or bias gets a three, and a very polarized comment is given a one. It might not be clear how attitude/tone differs from opinionation; it has to do with the way in which an opinion is expressed. If a comment author writes in a way clearly biased toward his/her opinion of a professor, it is a polarized comment. In other words, the author has already made up his/her mind about the professor, and is primarily interested in convincing the reader that his/her opinion is the opinion everyone should have. For example, saying, “the professor’s tests were way too long and I can’t believe he expected us to finish them in an hour” is more polarized than a statement such as “the professor’s tests seemed to be longer than the class expected, and I was often still working on them after the allotted time.” Both express an opinion, but the tone of the latter is more subdued.

The areas under content are relevance, specificity, and factual examples. A comment whose content is completely relevant to making a decision about a professor receives a five. One with some impertinent information gets a three, and one with little or no relevant information gets a one. Comments that explain their statements are given a specificity of five; those with only some statements backed-up are given a three, and those that do not give specifics get a one. Finally, comments that mention events from a class to justify all of their claims are awarded a five; comments that include only some examples get a three, and those with no examples receive a one.

The topical questions are as follows:

- *What topics did the professor cover? What did you learn in the class?*
- *Did the professor seem to have a genuine interest in the topics he/she discussed? How did this affect the course?*

- *Was the class intensive or lax? Did the environment the professor created seem formal or casual?*
- *How were lectures conducted? Did the professor lecture from notes or slides? What did you think of the professor's instructional method?*
- *Did you think the professor used the proper amount of examples or demonstrations during lectures?*
- *What did you think of the professor's homeworks, tests, and projects?*
- *Was the class in a large lecture hall or a small classroom? Did you feel the professor worked well with the class size?*
- *What type of student do you think would benefit most from this professor's style of instruction?*

A factor recorded for each comment, but not included in the score, is opinionation. This is the level to which a comment expresses an opinion that a professor is good, bad, or neither. An opinionation level of five means that the comment indicated that the professor is very good; a level of four is for comments that tended toward the positive; a level of three means that a comment was either neutral or contained a mix of positive and negative information; a level of two shows that the comment tended toward the negative; a level of one means that the comment was very negative. Although this does not affect the score, a comment written in a way that the opinionation overtakes the factual information will have a low attitude/tone score.

7.2 Comment Value Data

The following pages present the analysis of the comment scoring. Each system has a summary of the comment scores, and data on the comment style, content, topics, and opinionation.

7.2.1 Underground Guide to Course VI

The Spring 2002 issue of the *Underground Guide to Course VI* was evaluated, with 72 comments total. Overall, the comments received a mean score of 19.31/24.00; nearly all were within ± 4 points of that score. The comments in the *Underground Guide to Course VI* were of excellent style. Their spelling, grammar, and maturity were consistently very good, and their tone was usually unbiased. However, the content was less exceptional. A high relevance was offset by a general lack of specificity, and the comments rarely included any facts to back up their claims. Because the publication has a dedicated section for discussion of assignments and tests, that question was always answered. A handful of comments also discussed a professor's lectures, examples and demonstrations, and course content. Other topics were generally left unaddressed. Opinions were rarely given, as nearly all of the comments were neutral.

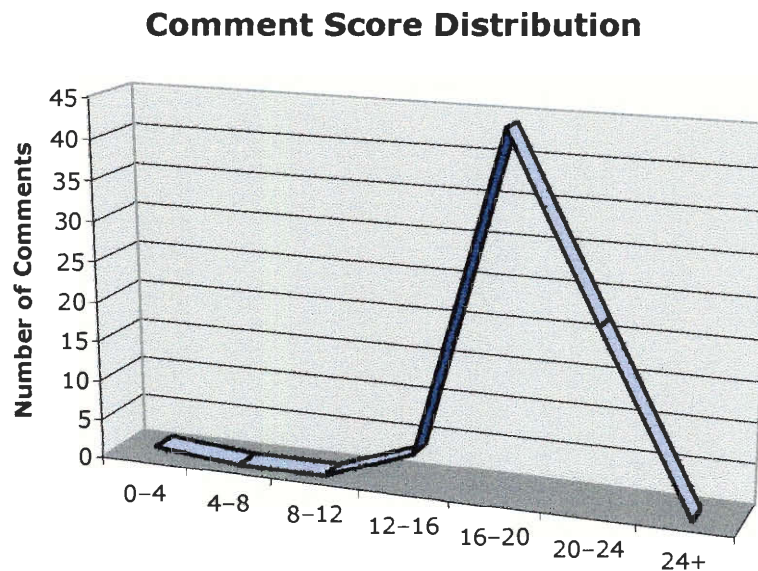


Figure 7-1: Underground Guide to Course VI Comment Score Distribution

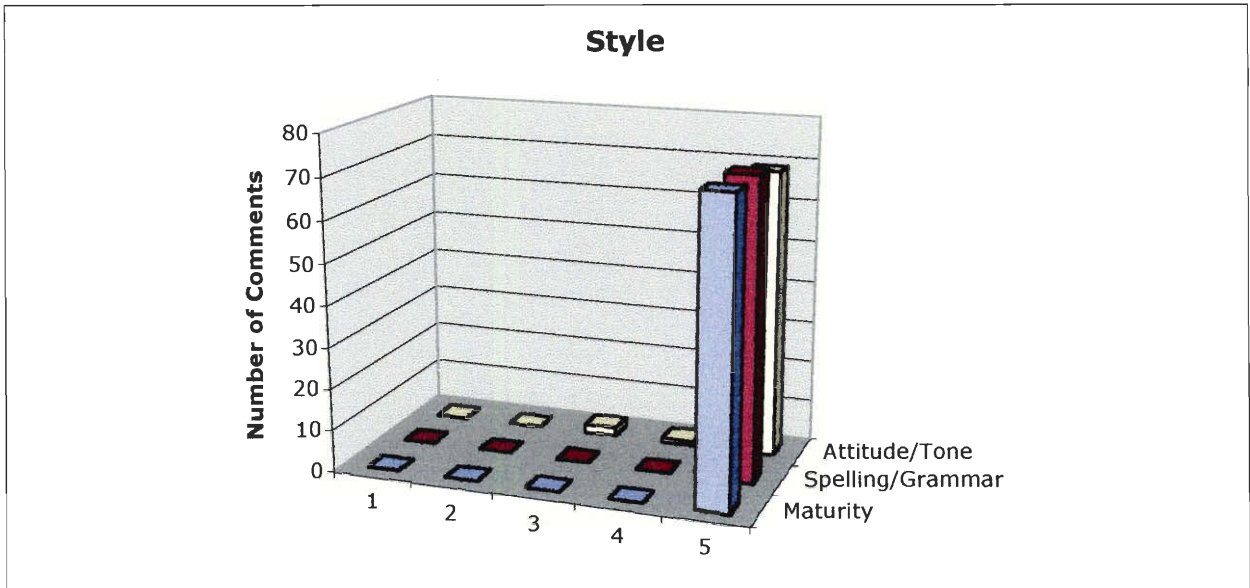


Figure 7-2: Underground Guide to Course VI Comment Style

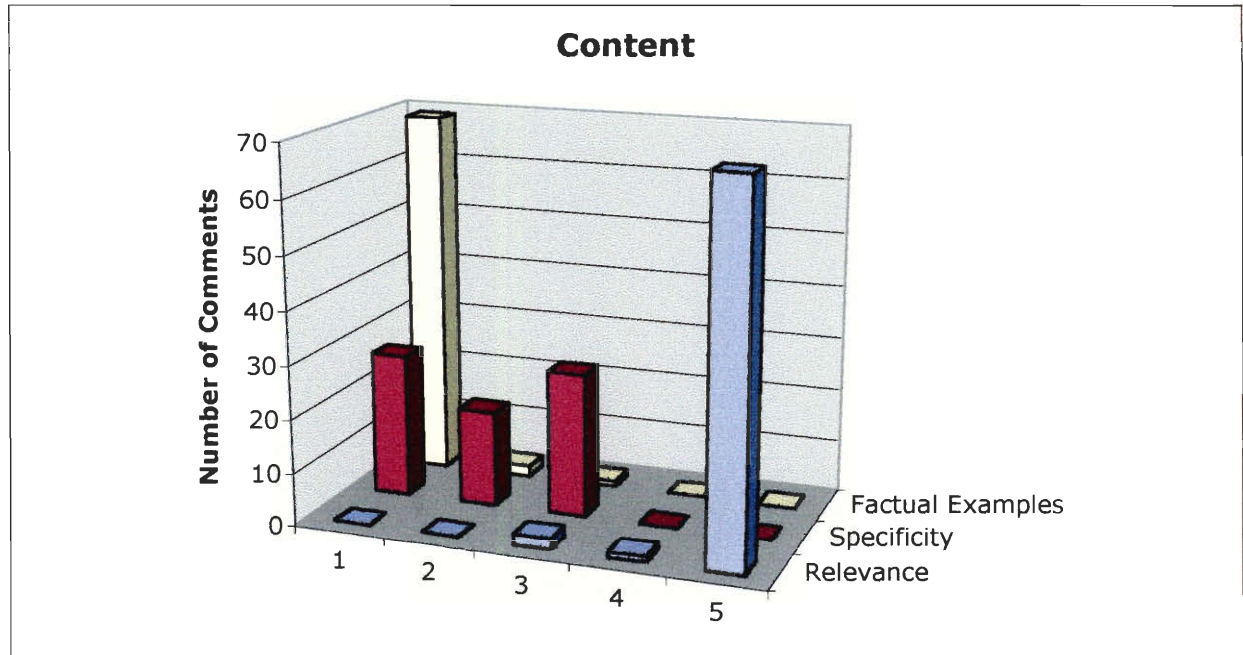


Figure 7-3: Underground Guide to Course VI Comment Content

Questions Answered

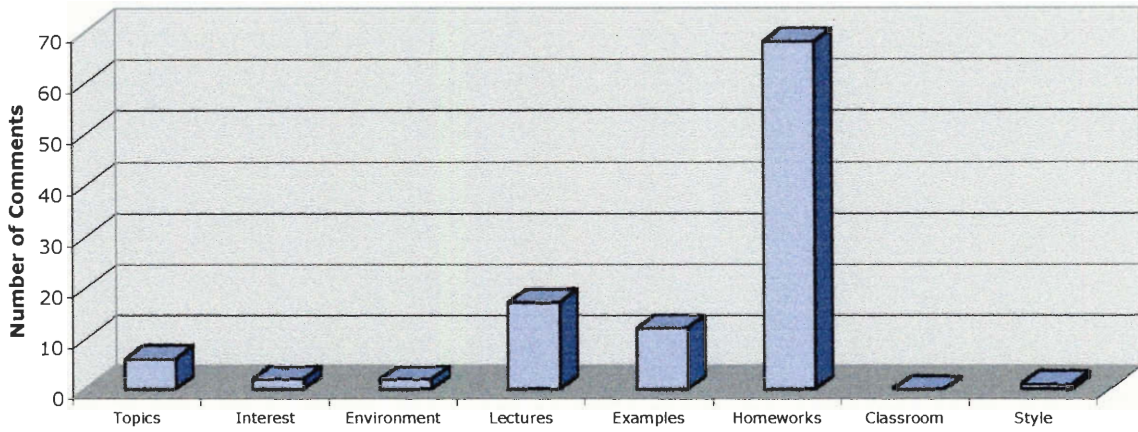


Figure 7-4: Underground Guide to Course VI Comment Questions Answered

Opinionation

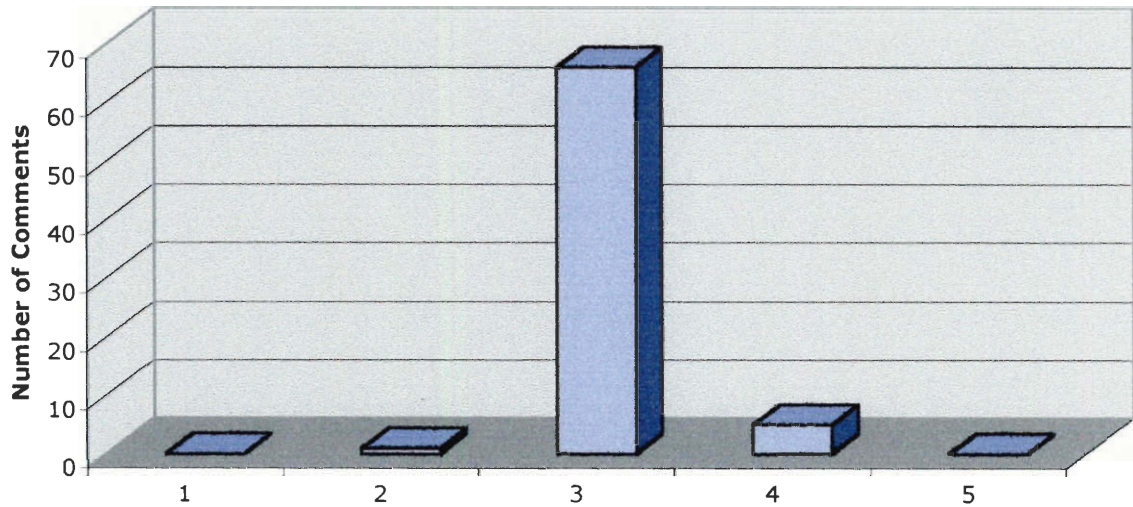


Figure 7-5: Underground Guide to Course VI Comment Opinionation

7.2.2 The Critical Review

The Fall 2002 issue of Brown's *The Critical Review* was evaluated, with 97 comments total. Because of research that indicates professor evaluations vary based on discipline (Arreola, 83), only comments on professors in the engineering and sciences were examined. The comments received a mean score of 17.70/24.00, and all were within ± 6 points of that score. Like the *Underground Guide to Course VI*, the comments in *The Critical Review* had good style. They had perfect maturity, nearly perfect spelling and grammar, and only occasionally included a biased tone. Unfortunately, their content was even worse than those in the MIT publication. While some of them included more facts and specifics, their relevance was poor. The comments addressed the issue of professors' lectures consistently, but fell short on every other topic. Some entries were slightly more opinionated than the *Underground Guide to Course VI*, but the trend again was slanted toward neutral comments.

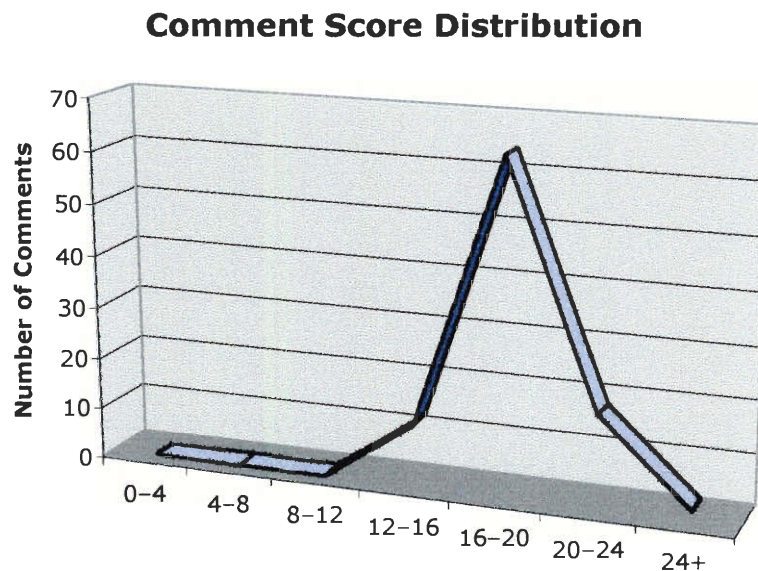


Figure 7-6: Critical Review Comment Score Distribution

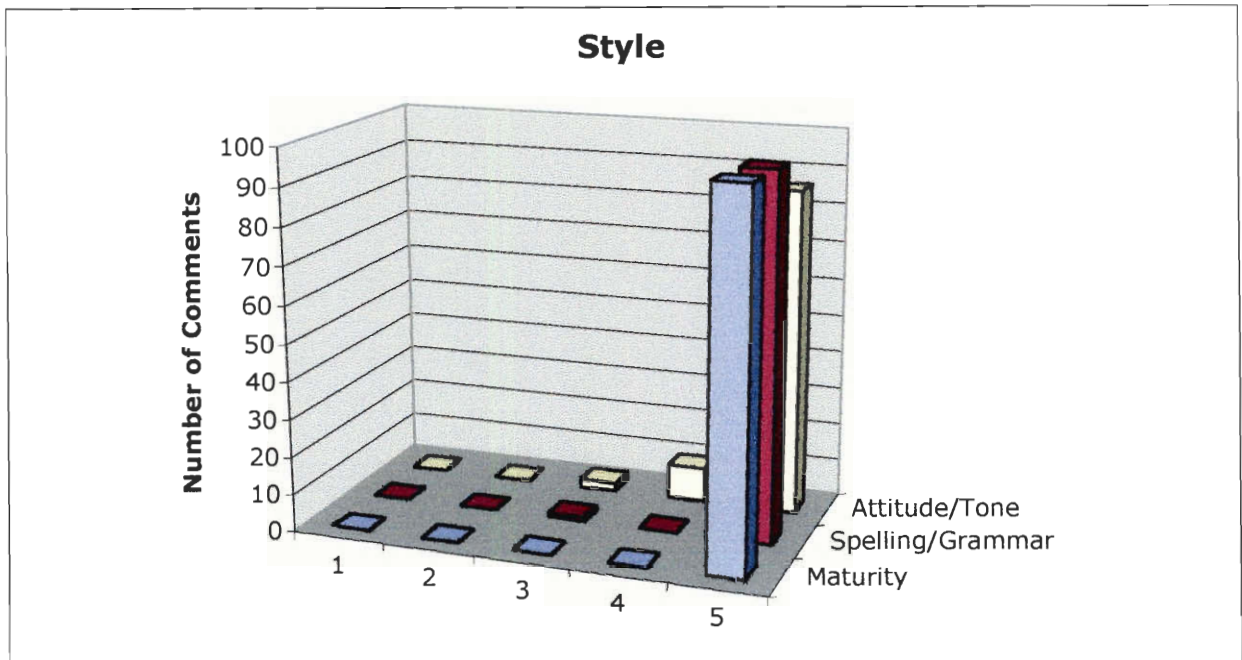


Figure 7-7: Critical Review Comment Style

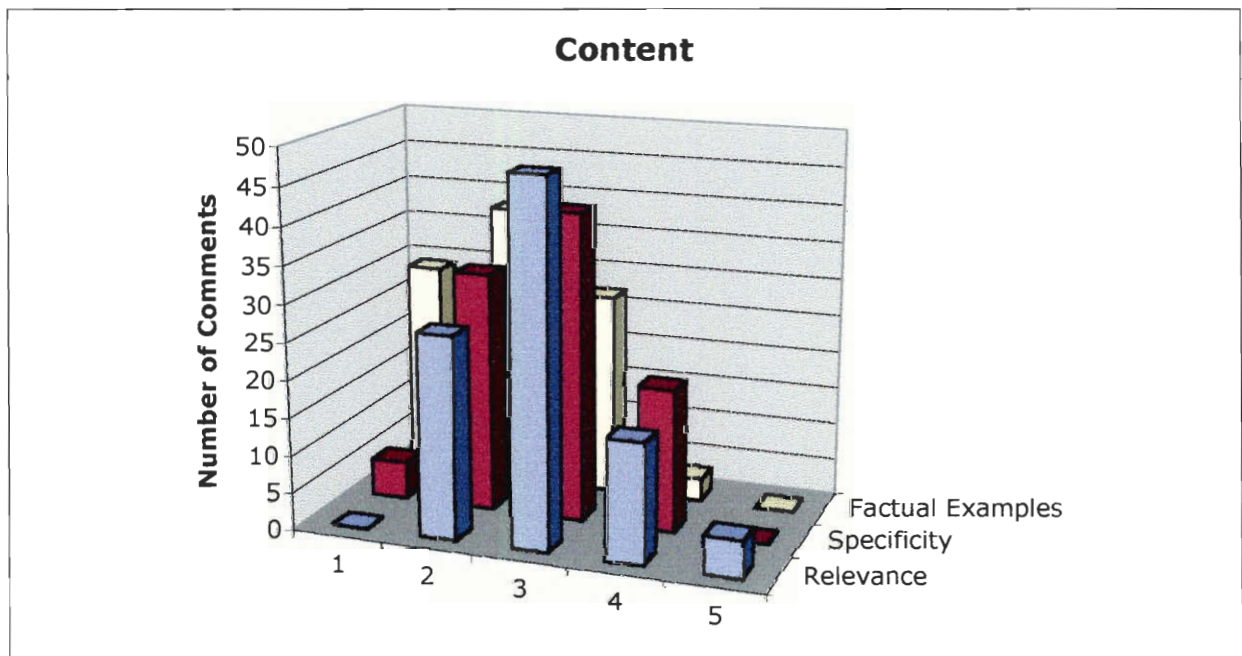


Figure 7-8: Critical Review Comment Content

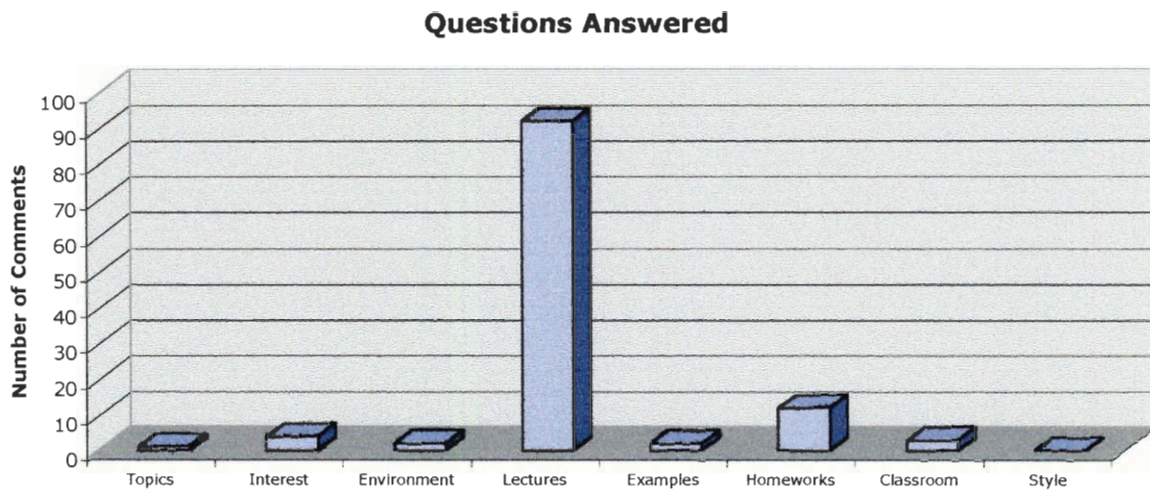


Figure 7-9: Critical Review Comment Questions Answered

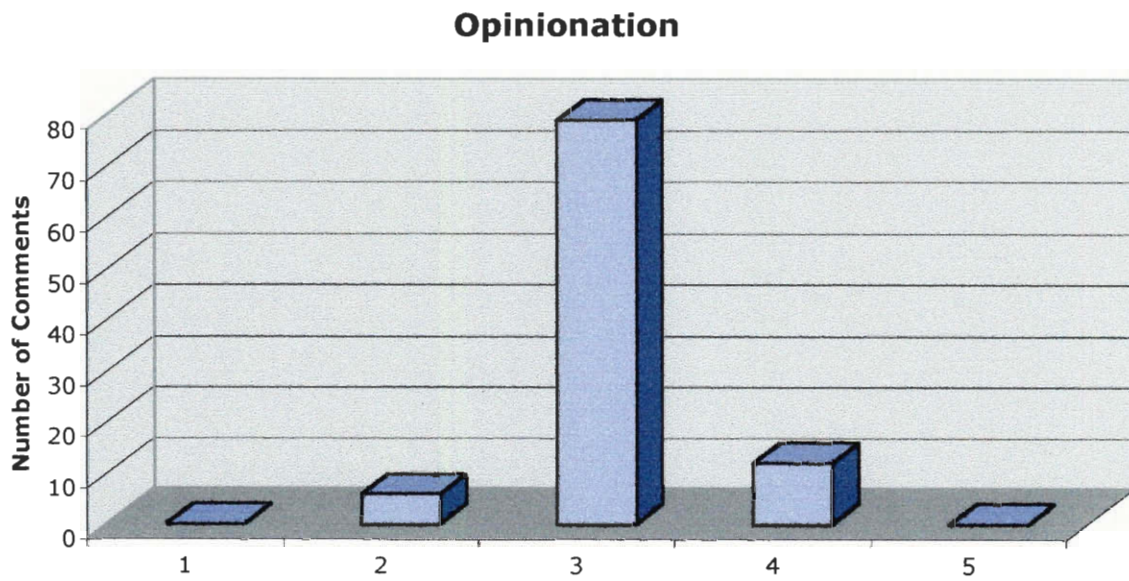


Figure 7-10: Critical Review Comment Opinionation

7.2.3 AroundU.com

The AroundU.com professor evaluation site contains several thousand comments on professors at Louisiana State University. As with *The Critical Review*, only comments on professors in the engineering and sciences were examined. In addition, some comments dealt only with class material, rather than the professor; these were ignored. The remaining 171 comments received a mean score of 10.89/24.00, which spanned all but the most extreme score ranges, and tended toward the lower end of the scale. The comment style was relatively mediocre, marred by spelling/grammar problems and poor maturity. The content scores were even less impressive; the comments were consistently low in each category. The topic of professors' homeworks, tests, and projects was addressed with some consistency, while other topics only came up once or twice in all the comments. Interestingly, many comments were very positive, with the remaining ones distributed somewhat evenly among the other opinionation levels.

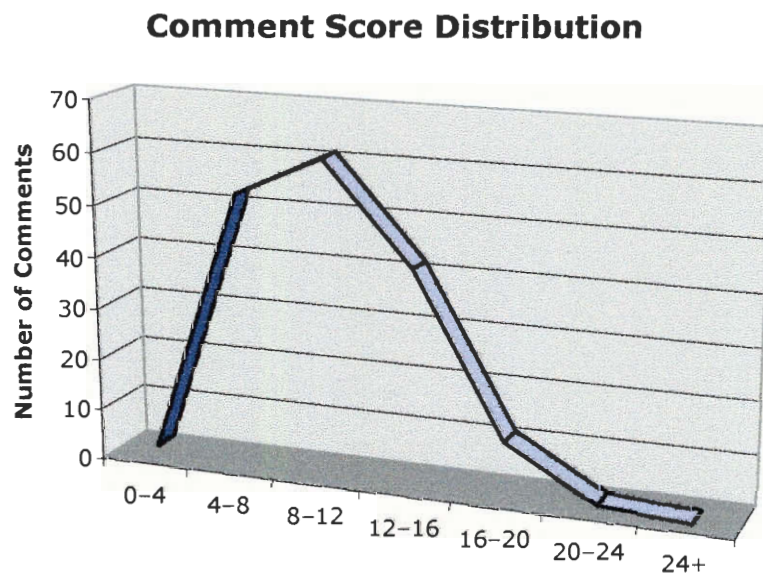


Figure 7-11: AroundU.com Comment Score Distribution

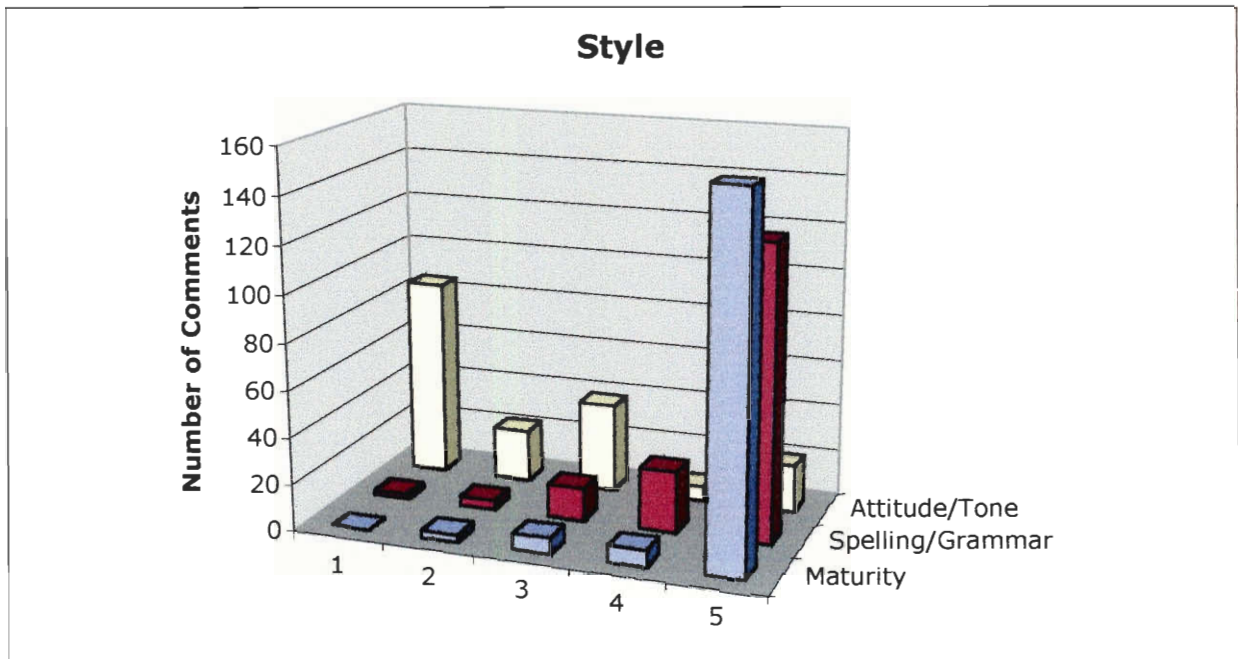


Figure 7-12: AroundU.com Comment Style

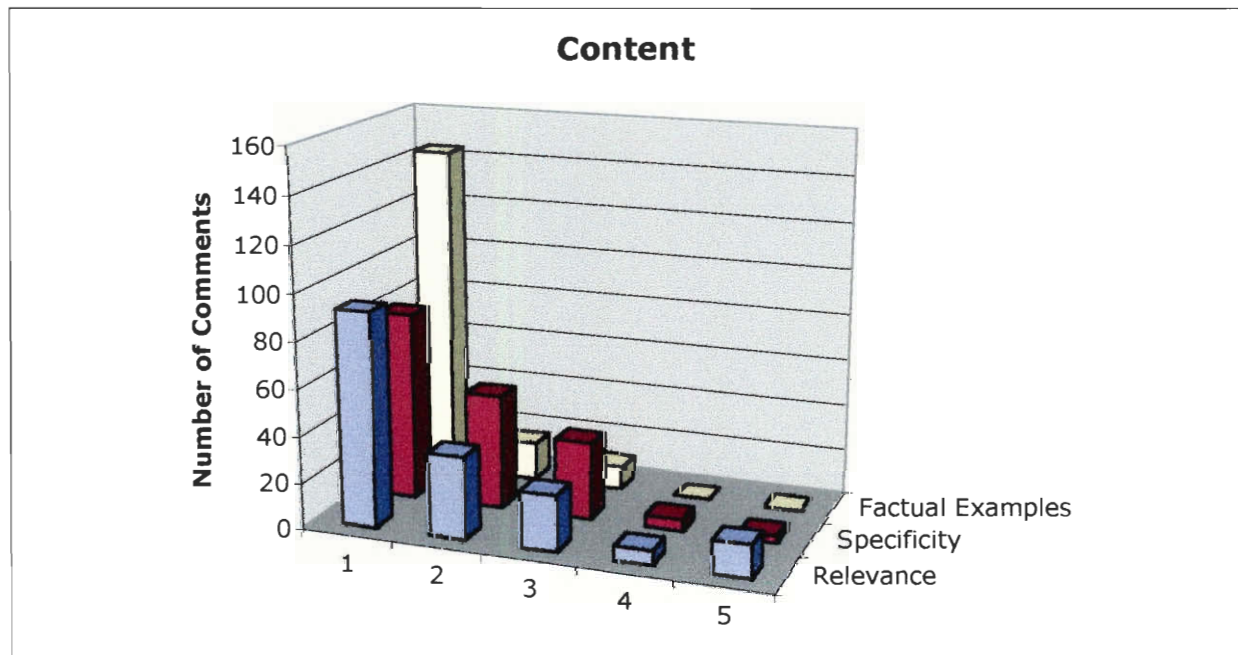


Figure 7-13: AroundU.com Comment Content

Questions Answered

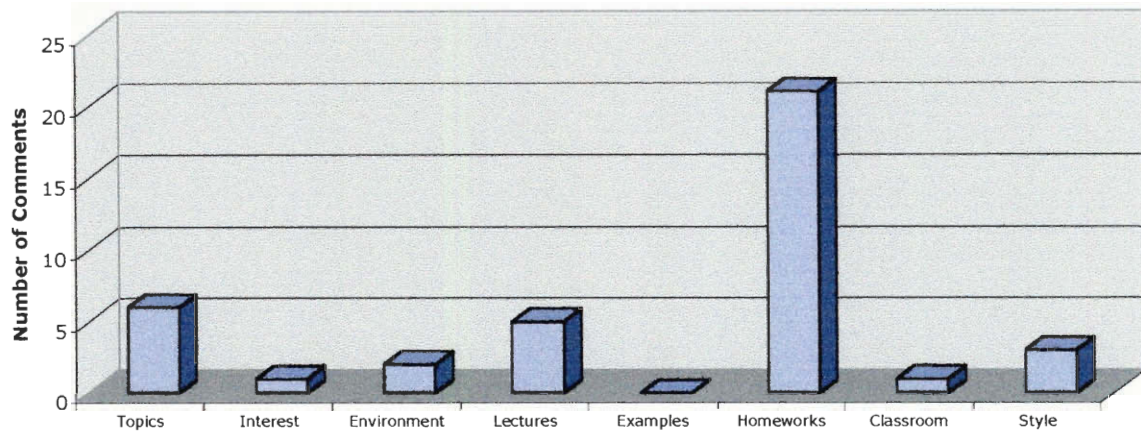


Figure 7-14: AroundU.com Comment Questions Answered

Opinionation

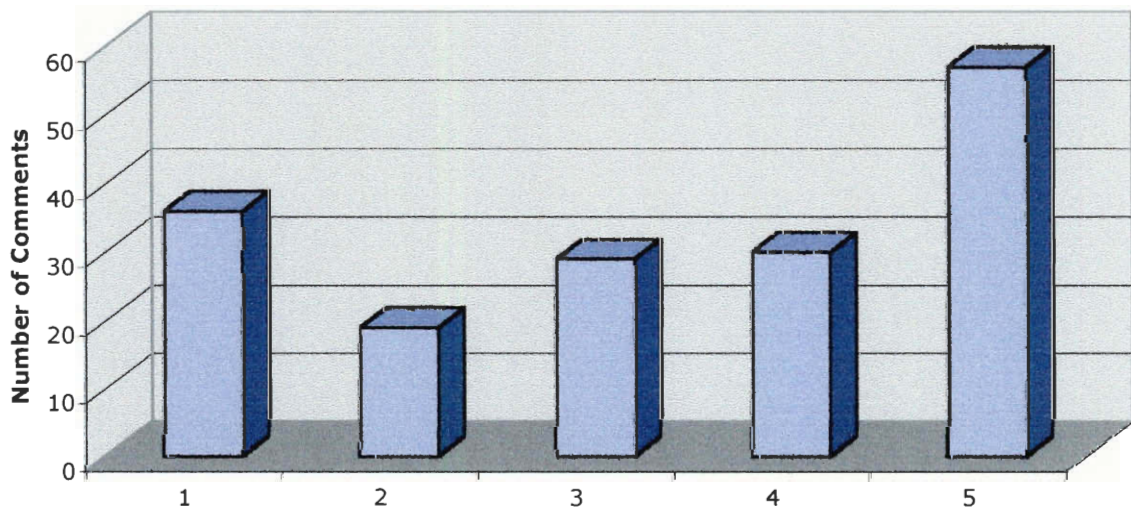


Figure 7-15: AroundU.com Comment Opinionation

7.2.4 RateMyProfessors.com

The RateMyProfessors database contains hundreds of thousands of comments for over three thousand colleges and universities. Because we did not have the time or resources to evaluate them all, we chose to evaluate only the comments on WPI professors. This still yielded a total of 772 comments, with an average score of 10.96/24.00. These spanned all the score ranges, although most were between 4.00 and 16.00. Their spelling/grammar and maturity levels were surprisingly high for an open system, although the attitude/tone was not as good. The comments scored in all ranges for tone, but many were at the lowest level, indicating significant polarization and bias. Comment content was also not very good. Specificity and relevance tended toward the lower end of the scale, and factual examples were virtually absent. This is not surprising, given the system's 255-character limit on comment length. The comments addressed nearly every topic we looked for, with the exception of examples/demonstration and classroom style. However, even the most frequently addressed topics only appeared in less than five percent of comments. Unlike the publication-style systems, many comments on RateMyProfessors were opinionated, with slightly more positive than negative.

Comment Score Distribution

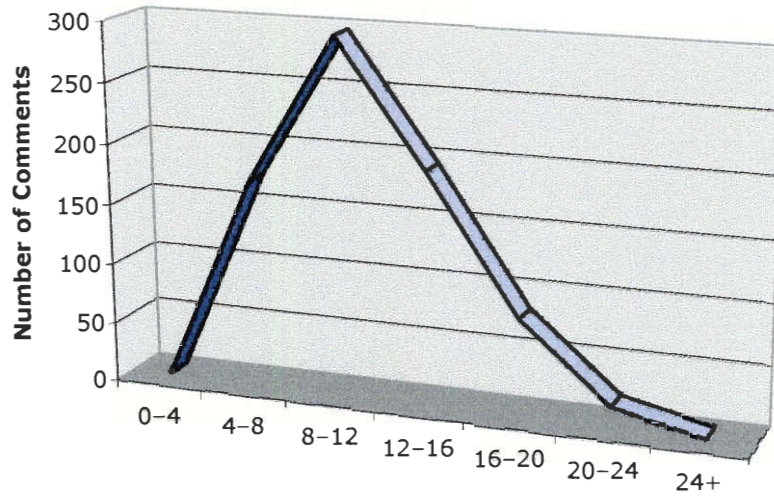


Figure 7-16: RateMyProfessors.com Comment Score Distribution

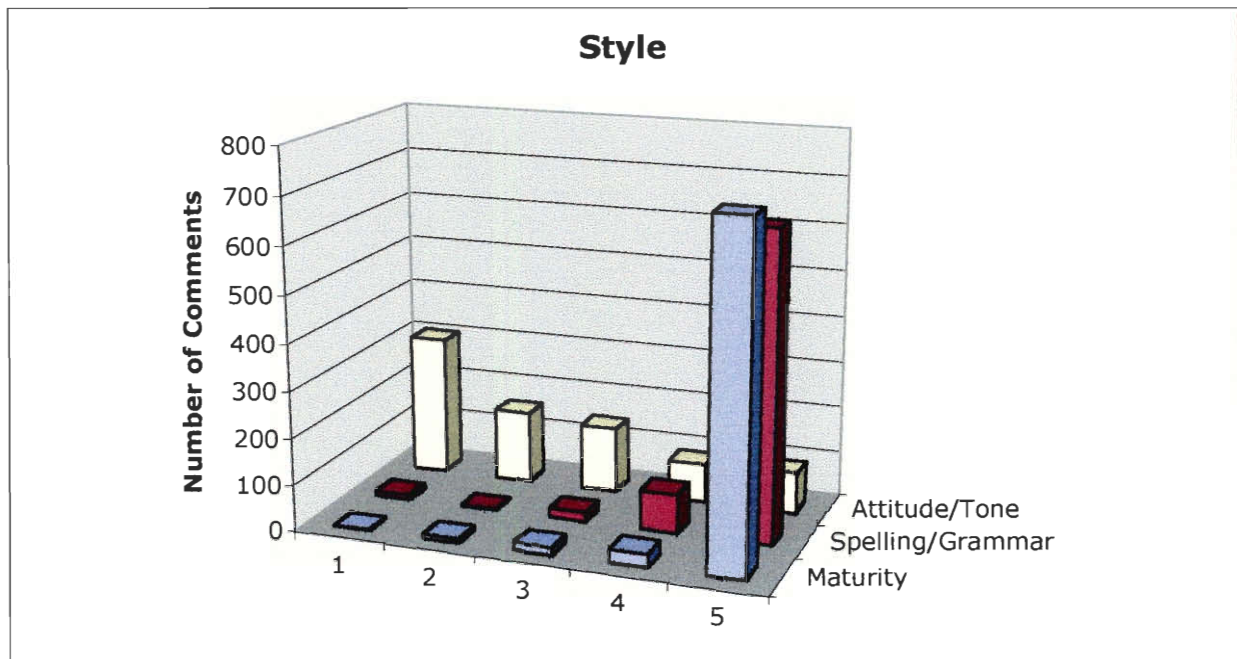


Figure 7-17: RateMyProfessors.com Comment Style

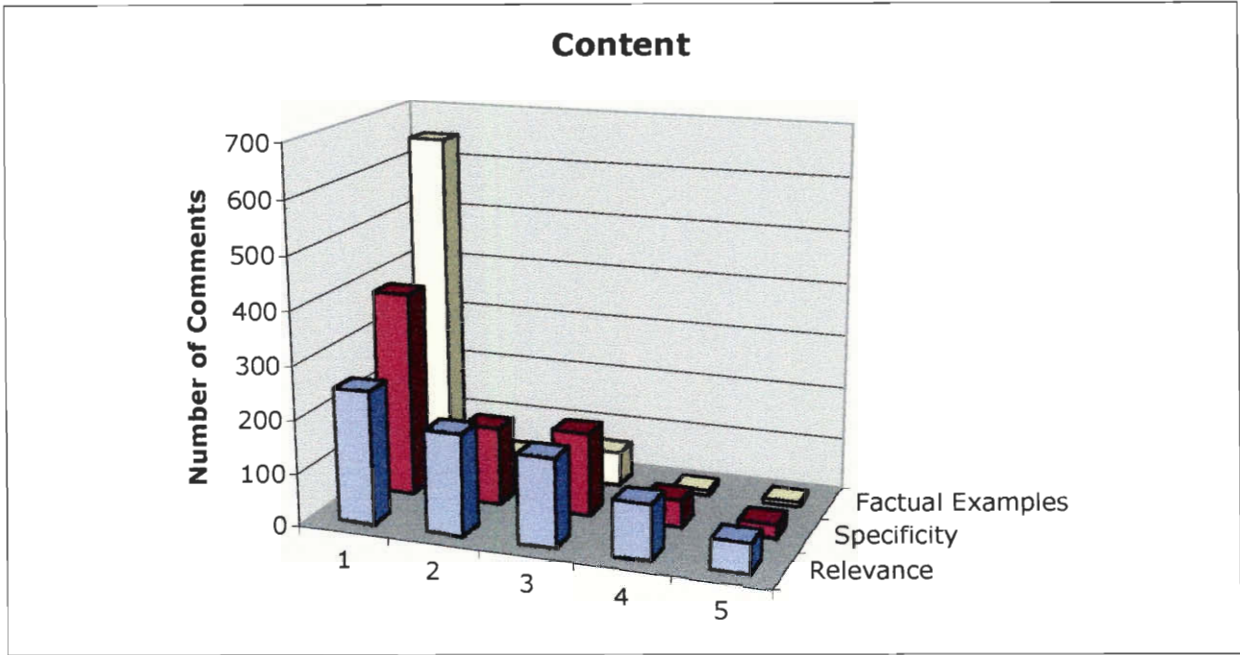


Figure 7-18: RateMyProfessors.com Comment Content

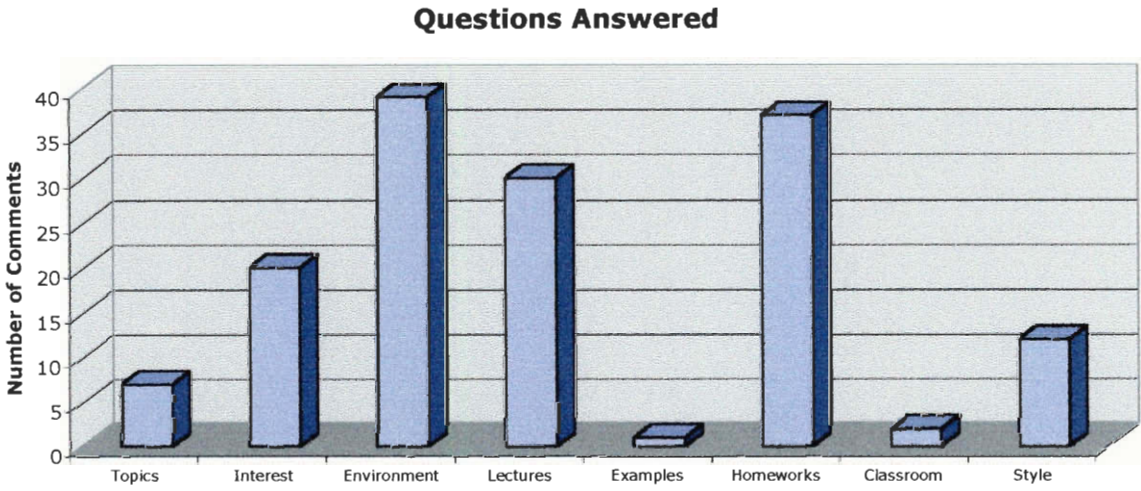


Figure 7-19: RateMyProfessors.com Comment Questions Answered

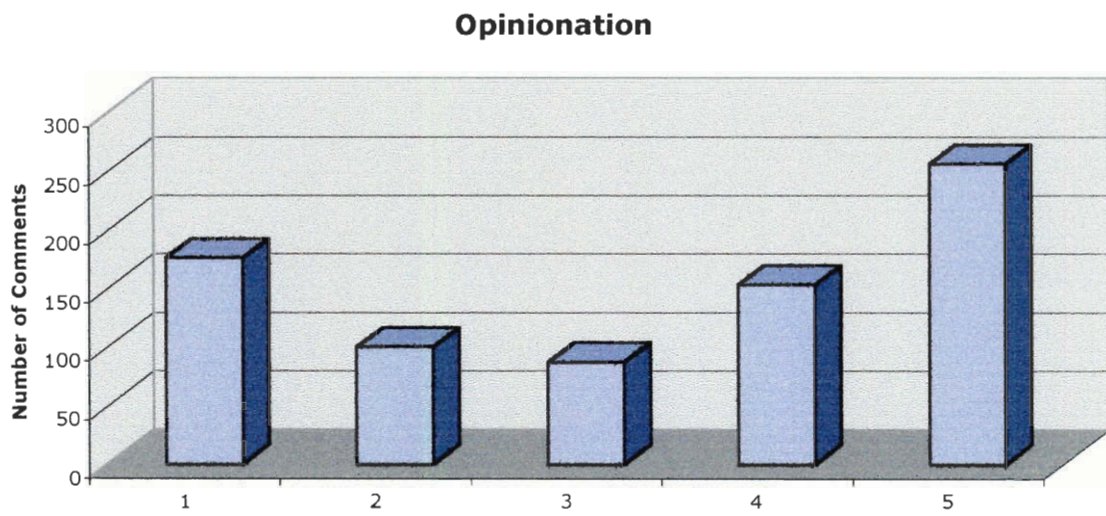


Figure 7-20: RateMyProfessors.com Comment Opinionation

7.2.5 PRACS

During the three months during which PRACS was active, students posted 28 comments. This number is high enough that data can be extracted from their evaluation, but low enough that the trends of the data might change as the system continues to be used (see Section 8). These comments received a mean score of 19.71/24.00. The individual comment scores spanned the range; most scored high, but a handful were very low. Most comments were written in a mature fashion, and had reasonably good spelling and grammar. Many were written without polarization or bias, while several were perceptibly biased. With few exceptions, the comments all had relevant content. Specificity was sometimes lacking, and factual examples were rare, but sometimes present. Most topics were covered by the comments, although this is not at all surprising, since we list them all in the guidelines for what to post on the site. Unlike other unrestricted systems, many comments were neutral, although the majority did express an opinion. Most commonly, a comment would express a positive opinion, but also include any negative aspects of a professor's teaching where applicable.

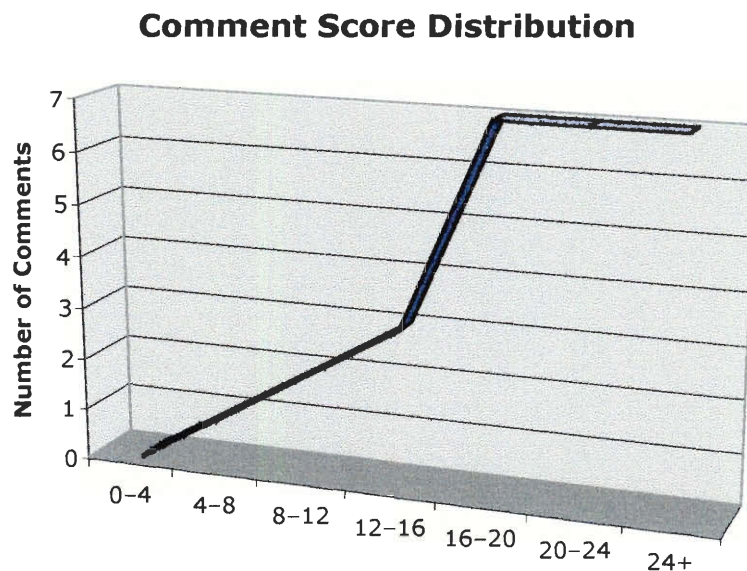


Figure 7-21: PRACS Comment Score Distribution

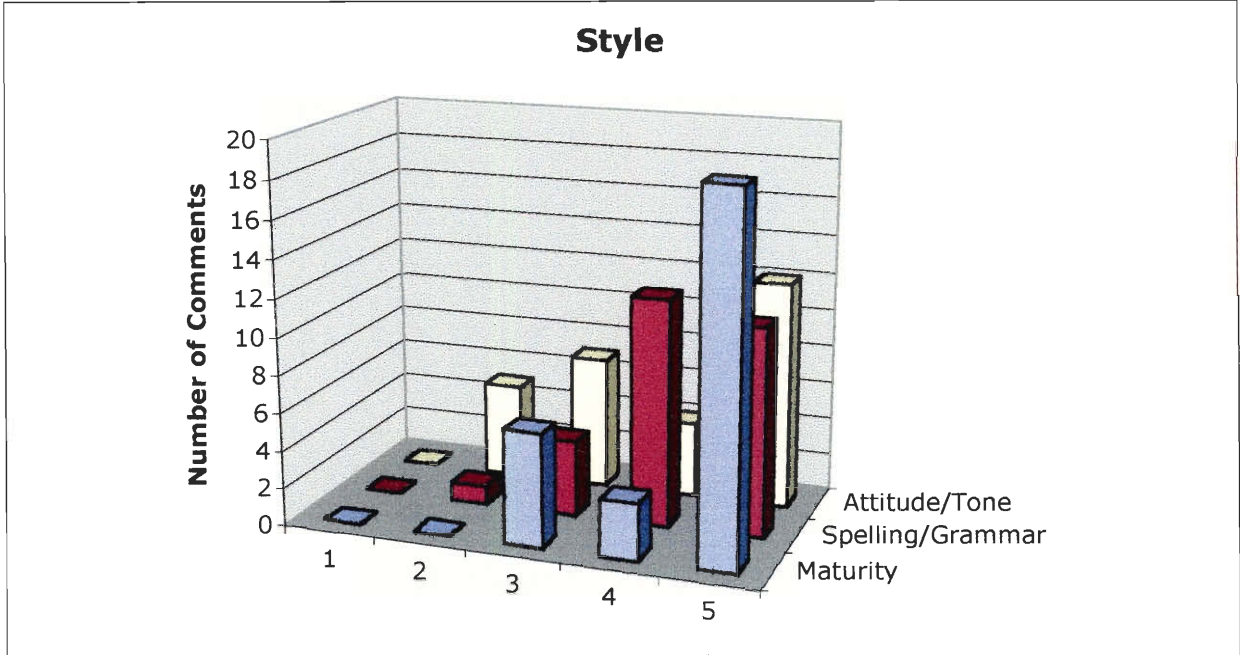


Figure 7-22: PRACS Comment Style

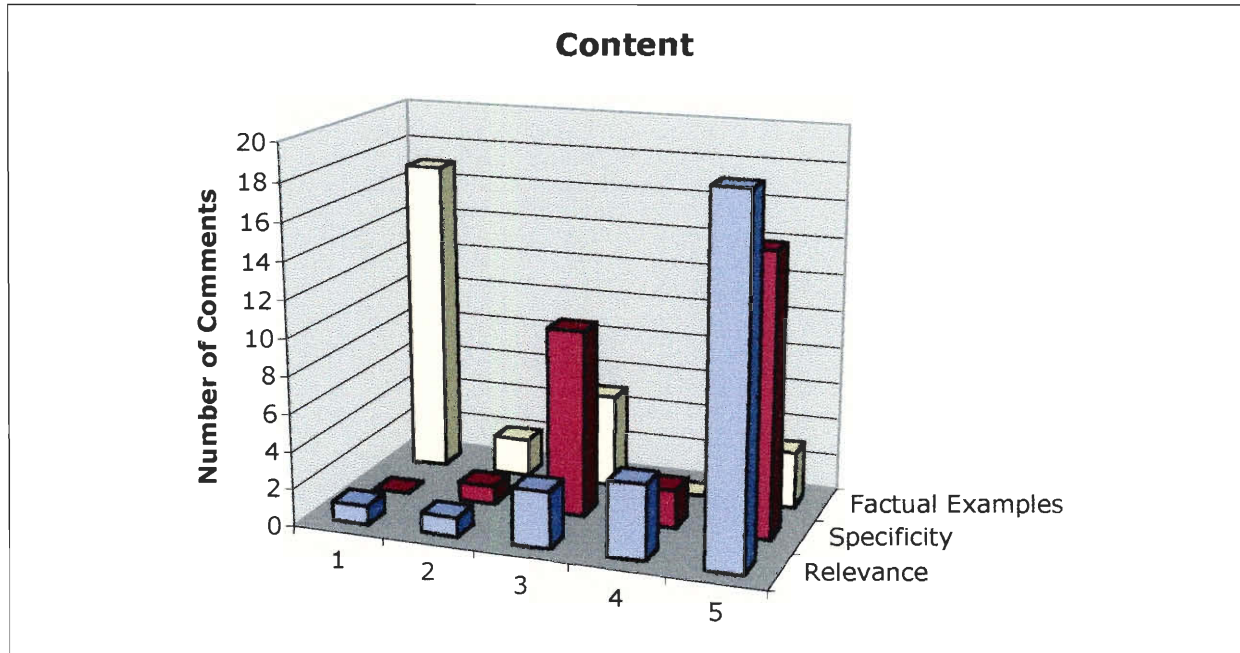


Figure 7-23: PRACS Comment Content

Questions Answered

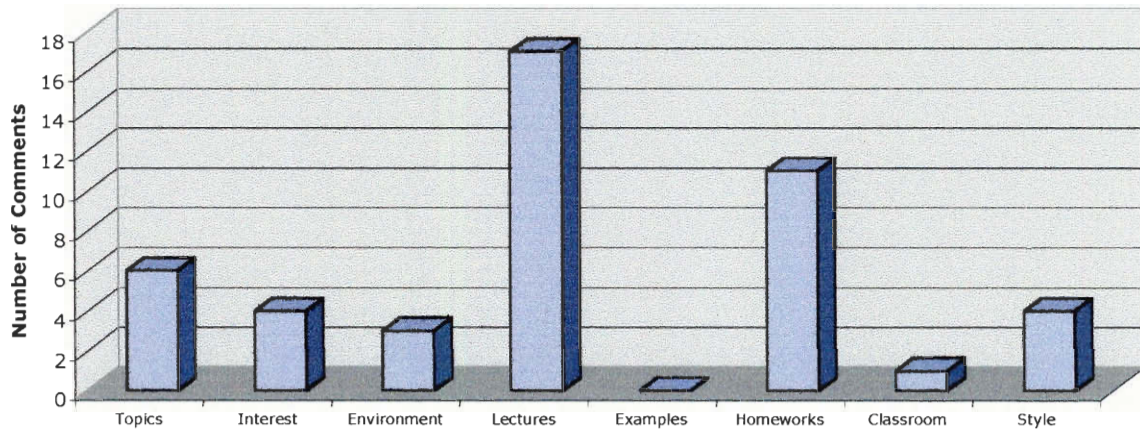


Figure 7-24: PRACS Comment Questions Answered

Opinionation

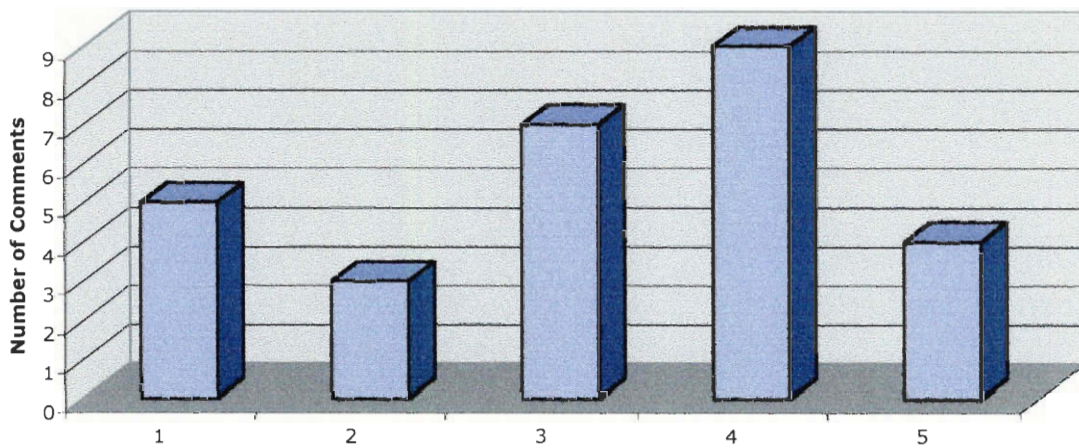


Figure 7-25: PRACS Comment Opinionation

7.3 Data Mining

Sometimes, raw data contains information that is not always obvious from a simple analysis. More complex methods can be used to extract this information in a process generically called “data mining.” Data mining usually involves looking at data from different angles or dimensions and identifying any relationships found (Frاند, 1). We chose to implement a simple data mining process in our analysis script. Specifically, we correlated the average score of each element in our scoring system to the different opinionation levels a comment could be classified as, to see if there is a correlation between opinionation and quality of a comment. Note that we are correlating levels of rating, which can be a 1, 2, 3, 4, or 5, to the average score that an element contributes to a total, which can be anything from 0.0 to 4.0. This was done for two of the five systems we collected data for. The first is RateMyProfessors.com, because more data was available for it than the other systems by far, and it included a variety of comment types. The second was PRACS, since we want to learn as much about the qualities of the new system as possible.

7.3.1 RateMyProfessors.com

On first glance, it appears that neutral comments are the most well-written. However, this is almost entirely due to their attitude/tonе scores. This makes sense, as comment authors with opinions will often write in a way that makes their opinion very evident. Likewise, the maturity of the most negative comments is slightly lower than the rest, as the authors of those comments are probably more likely to use profanity to describe their professors, or attack their character. Meanwhile, the spelling and grammar of the comments was consistent across all opinionation levels.

Interestingly, comments that express a marginally negative opinion have the highest content score. They include the most factual examples, have the most specifics, and are the most relevant. This seems to indicate that those students who came away from a class somewhat dissatisfied with a professor will write the most about their experiences. This does not hold true for comments that express a very negative opinion, however. Conversely, comments that express a strong positive opinion have a very low content score. Thus, the most satisfied students apparently do not feel compelled to write in detail.

Overall, neutral comments ultimately had a marginally higher score than the rest. However, comments with a slight opinion were not far behind with their scores. It can be said, then, that the better comments on RateMyProfessors.com are those that do not take a strong stance on a professor; however, the best comments are not necessarily completely neutral.

Comment Opinionation Vs. Comment Style

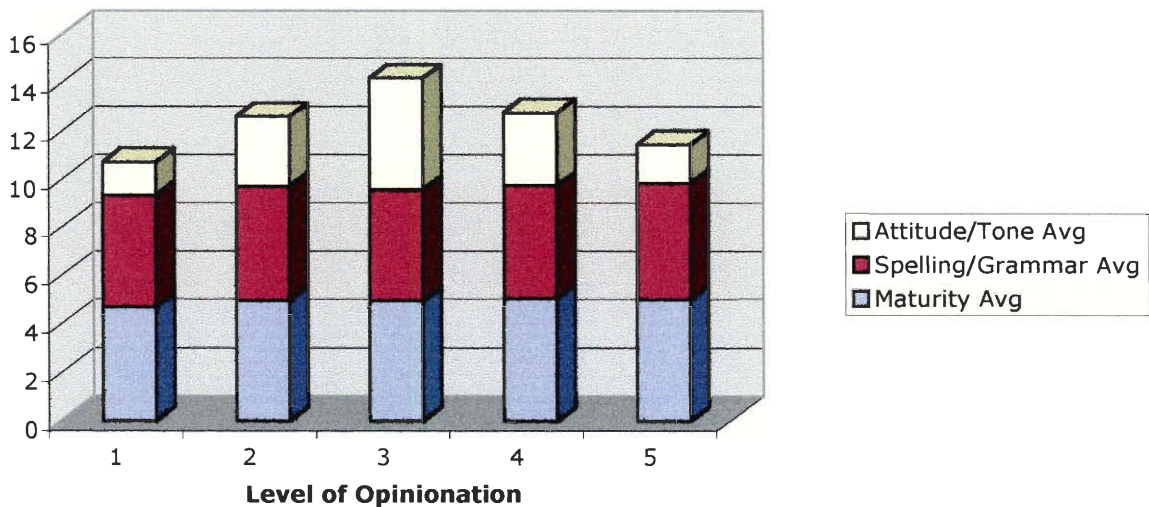


Figure 7-26: RateMyProfessors.com Comment Opinionation vs. Comment Style

Comment Opinionation vs. Comment Content

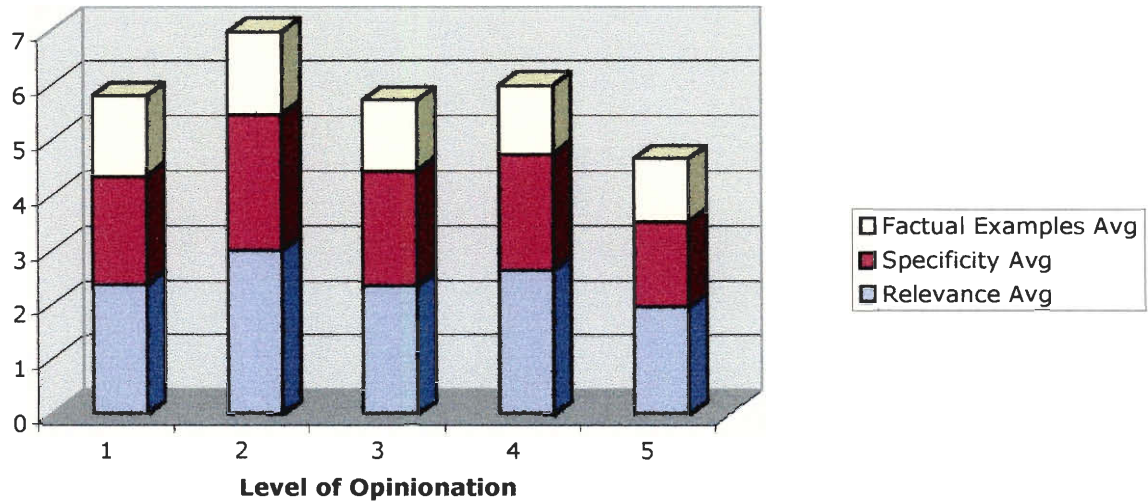


Figure 7-27: RateMyProfessors.com Comment Opinionation vs. Comment Content

Comment Opinionation Vs. Average Overall Score

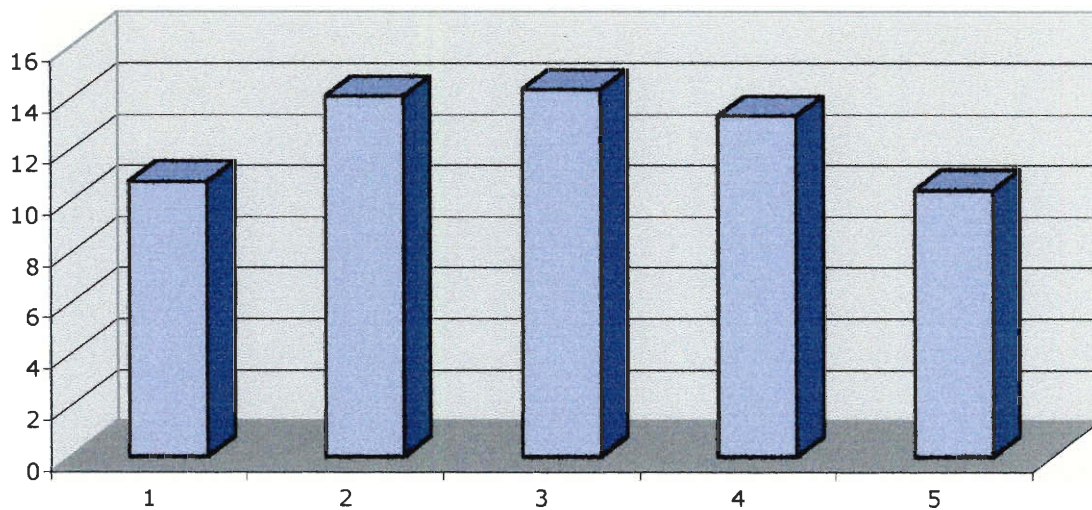


Figure 7-28: RateMyProfessors.com Comment Opinionation vs. Average Overall Score

7.3.1 PRACS

As with RateMyProfessors, neutral comments on PRACS have a high-scoring style. However, the most positive comments also have just as high style scores, with the same distribution of points in each of the three categories. This indicates that the PRACS system is more conducive to authors of very positive comments writing in a better fashion, relative to RateMyProfessors.

As with RateMyProfessors, comments that express a marginally negative opinion have the highest content score, although the difference is not as pronounced with PRACS, and is due to a slightly higher score for factual examples than the neutral and very positive comments. The relevance and specificity of the neutral, somewhat positive, and very positive comments are the same. Negative comments are less specific and less relevant, but include more examples. Interestingly, while marginally negative comments have the lowest scores for relevance and specificity, they have the highest score for factual examples of all the opinionation levels.

Neutral and positive comments had higher overall scores than negative comments; this is in contrast to RateMyProfessors, where only neutral and marginally opinionated comments had higher scores. The PRACS system appears to allow strongly positive comments to be written with the best style, most content, and largest number of topics covered.

Content Opinionation Vs. Comment Style

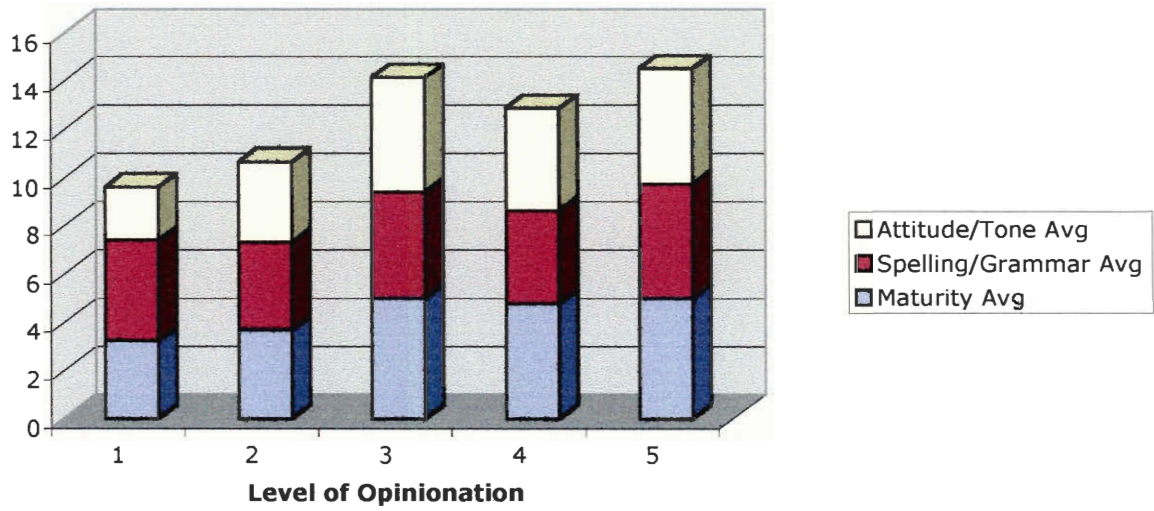


Figure 7-29: PRACS Comment Opinionation vs. Comment Style

Comment Opinionation vs. Comment Content

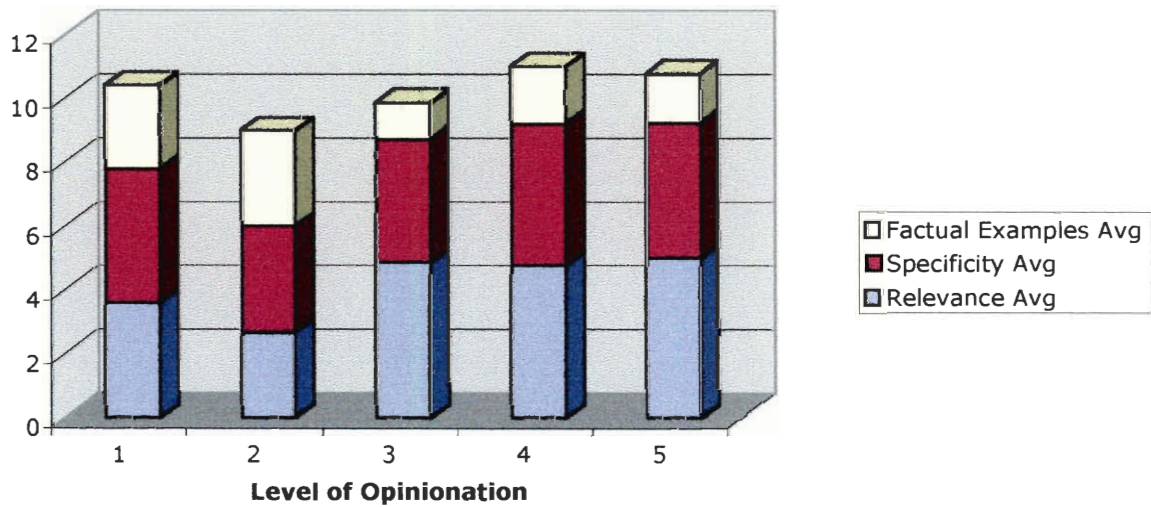


Figure 7-30: PRACS Comment Opinionation vs. Comment Content

Comment Opinionation Vs. Average Overall Score

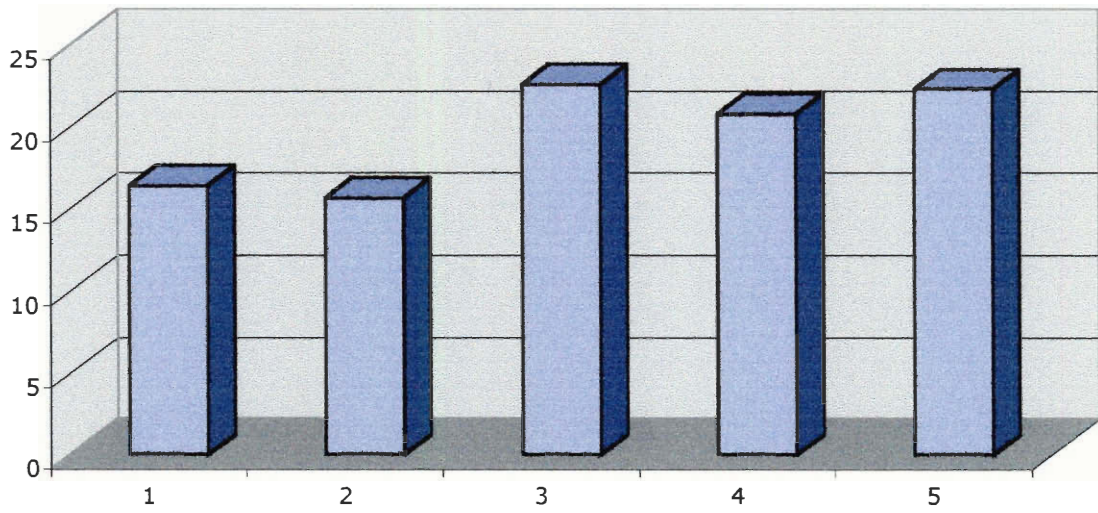


Figure 7-31: PRACS Comment Opinionation vs. Average Overall Score

7.4 Example Comments

While evaluating the comments on PRACS and the existing systems, some stood out as examples of the extremes in our scoring system. We noted them, and have listed them here, with some commentary.

From RateMyProfessors.com: “Absolutely terrible in every respect- holds grudges, patronizing, vindictive, evil woman.”

While this comment certainly gives the impression that no student would want to enroll in a class with this instructor, it does not contain any information that would allow a student to independently come to the same conclusion (about the instructor in question being vindictive, etc.).

From RateMyProfessors.com: “Hulk mad!!! Hulk smash!!!”

This comment was certainly intended to be humorous with regard to the professor about whom it was written. Unfortunately, while it may succeed in that goal, it is less informative than the previous comment. Not only does it not contain comprehensive information about the professor's teaching style and methods, but it also does not contain any sort of opinion at all. These types of comments were common among the research.

From AroundU.com: “[The Professor] sucks. Try not to take him unless you have tits.”

This comment author is providing no information other than his/her opinion, and not justifying it at all. In addition, the author is potentially slandering the professor, implying that he is partial to female students. If there is in fact a bias in the class, it should be taken up with the university administration, not implied on a Web site.

From RateMyProfessors.com: “I HATE MATH MOVIES!!!!!!!!!!!!!!!!!!!!!!”

Although this comment represents terrible typographic skills and over-exaggeration, it may certainly contain enough content to keep a certain type of person away from this professor/course (i.e., those that also 'HATE MATH MOVIES'). If the student that wrote this comment had expanded upon his or her dislike of the professor, it could have received a much higher score when evaluated with the PRACS rubric.

From PRACS: “I'm trying to come up with something good to say about this professor before I launch into the rest. How about this: he's a nice guy...”

This is the start of a largely negative comment. However, the student made a conscious effort to discuss any positive aspects of the professor, in the interests of being comprehensive. A

reader might place great importance on whether or not a professor is a “nice guy,” and may deem the rest of the comment inconsequential.

From RateMyProfessors.com: “Hah Hah Hydrogen”

A separate class of comment is one where the comment itself is either an in-joke (presumably for those that have been enrolled in a class taught by this professor in the past), or a nonsensical comment. The comment shown above may be either of these, but in any case, it is completely useless to a student trying to obtain information about this professor.

From the *Underground Guide to Course VI*: “[The Professor] was very knowledgeable.”

This is the entirety of the information given about this professor, which represents the input of several students. It contains no specifics, no facts, and gives no details that would help a student decide whether or not to take a class, beyond that the professor knows the material.

8. Conclusion

8.1 Results

Several points were learned as a result of this project. In summary, they are as follows:

- PRACS has the potential to equal the popularity of other professor evaluation systems, based on its initial response rate. (Section 6.3)
- First-time visitors to PRACS are likely to return, indicating that the system is designed well enough to appeal to students. (Section 6.3)
- Word of mouth is an effective publicity method for PRACS, and its response rate will depend on students telling their peers about the system. This is further indication that visitors like the system, since they feel it will also be useful to their friends. (Section 6.3)
- Full anonymity is not important for many PRACS users. The research (Franklin, 1) (Hansen, 5) stated that students would not want to write comments without total anonymity. However, because many users chose to forgo the option of not linking their comments with their identities, this is not the case. This may be the case because only the PRACS system administrators have access to the usernames of students posting comments, not professors visiting the site, limiting the possibility of retribution. A court order or subpoena could force the administrators to reveal this information, but students are either not concerned about this or not aware of this. (Section 6.3)
- Periodical professor evaluation systems, which contain published articles that summarize student input, are well-written but lacking on content. (Section 7.2.1, 7.2.2)
- Online professor evaluation systems, with short comment lengths and numerical ratings, are not very well-written, and tend to lack both relevance and unbiased commentary. (Section 7.2.3, 7.2.4)
- PRACS comments are more well-written than other online systems, and contain more content than periodical, summary-based systems (Section 7.2.5)
- Quantitative scoring indicates that overall, existing online systems do not have very good comments, whereas the periodical system comments are much better. PRACS comments are even better than those. (Section 7.2)
- Although the research (Franklin, 2) indicated that student-written comments would be overwhelmingly positive or negative, this was not the case. In both AroundU.com and RateMyProfessors.com, strongly opinionated comments were the majority, but only by a small margin. In PRACS, neutral and slightly opinionated comments were the majority. (Section 7.2.3, 7.2.4, 7.2.5)
- The best comments on RateMyProfessors.com are the neutral comments, according to our quantitative scoring process (Section 7.3.1)
- However, the best comments on PRACS are those which express a positive opinion, indicating that the system allows opinionated comments to be well-written and contain much useful content (Section 7.3.2)

8.2 Further Study

This report only covers a fraction of the information that can be learned from the PRACS system since it has only just begun operation. A future project could discover far more, once PRACS is more widely used. The most obvious data to collect would be a new evaluation of the comments according to our scoring scheme. This could be used to verify that the data collected in this project was still valid; if not, a new analysis could take place and new conclusions drawn. Another possibility is to improve the system based on user feedback. Both readers and comment authors might have suggestions on how PRACS could work better; if they are consistent with the research, the suggestions could be implemented. Finally, a study could be done of the system's effect on professor selection. PRACS users could be surveyed about whether or not what they read in the comments determined what professors they chose to take classes with, and if the guidance provided by the comments was accurate. This is the most interesting data, as it will show if the system is actually useful to students and how well it accomplishes its goals.

Sources and References

AroundU.com. AroundU.com. 2003.

<<http://old.universitytools.com/utools/ratings/>>

Arreola, Raoul A. *Developing a Comprehensive Faculty Evaluation System*. Boston: Anker Publishing Company, Inc. 2000.

Biographical Sketch for Raoul A. Arreola. Center for Educational Development and Assessment (CEDA). 2003.

<<http://www.cedanet.com/biosketch.html>>

Bylaws of the Constitution. Worcester Polytechnic Institute. 2001.

<<http://www.wpi.edu/Campus/Faculty/Handbook/bylaw1.html>>

Franklin, Jennifer, and Elana Berman. *Using Student Written Comments in Summative Evaluation*. Tucson, AZ: The University of Arizona. 2001.

Hansen, Peter and Judith Miller. *Report of the Working Group on Course Evaluations*. Worcester, MA: Worcester Polytechnic Institute. 2002.

Lamb, Andrew A., ed. *Underground Guide to Course VI*. Cambridge, MA: Eta Kappa Nu, Beta Theta Chapter. 2002.

RateMyProfessors.com. RateMyProfessors.com. 2003.

<<http://www.ratemyprofessors.com/index.jsp>>

The Critical Review: Fall 2002. Brown University. 2002.

<http://www.brown.edu/Students/Critical_Review/>

“The Torment of Teaching Evaluations.” Toth, Emily. *The Chronicle of Higher Education*, March 24, 2003.

What is Data Mining?. Frand, Jason. University of California, Los Angeles. 1996.

<<http://www.anderson.ucla.edu/faculty/jason.frand/teacher/technologies/palace/datamining.htm>>

Appendix A: Screenshots

All professor names have been censored in these images.

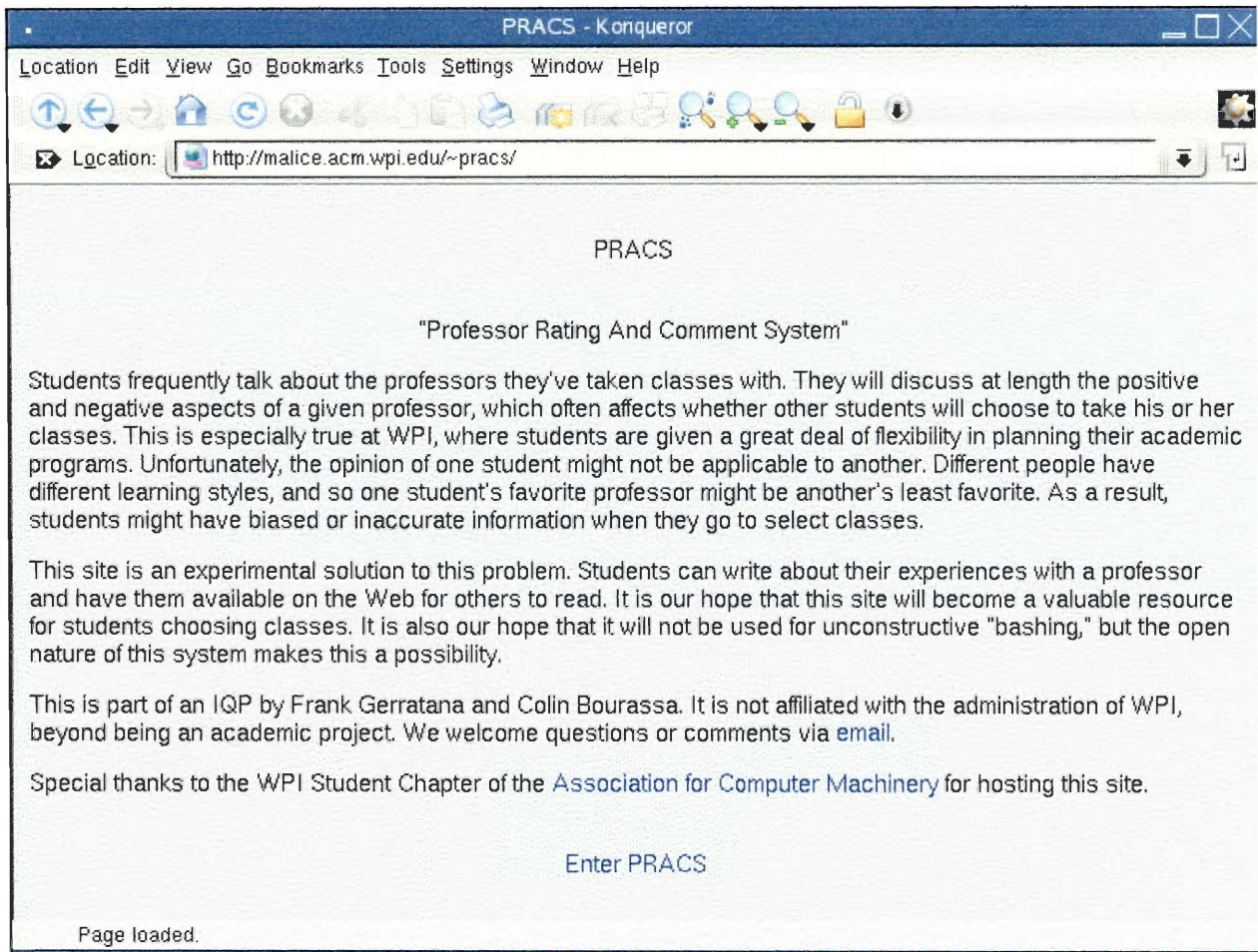


Figure A-1: PRACS Introductory Screen

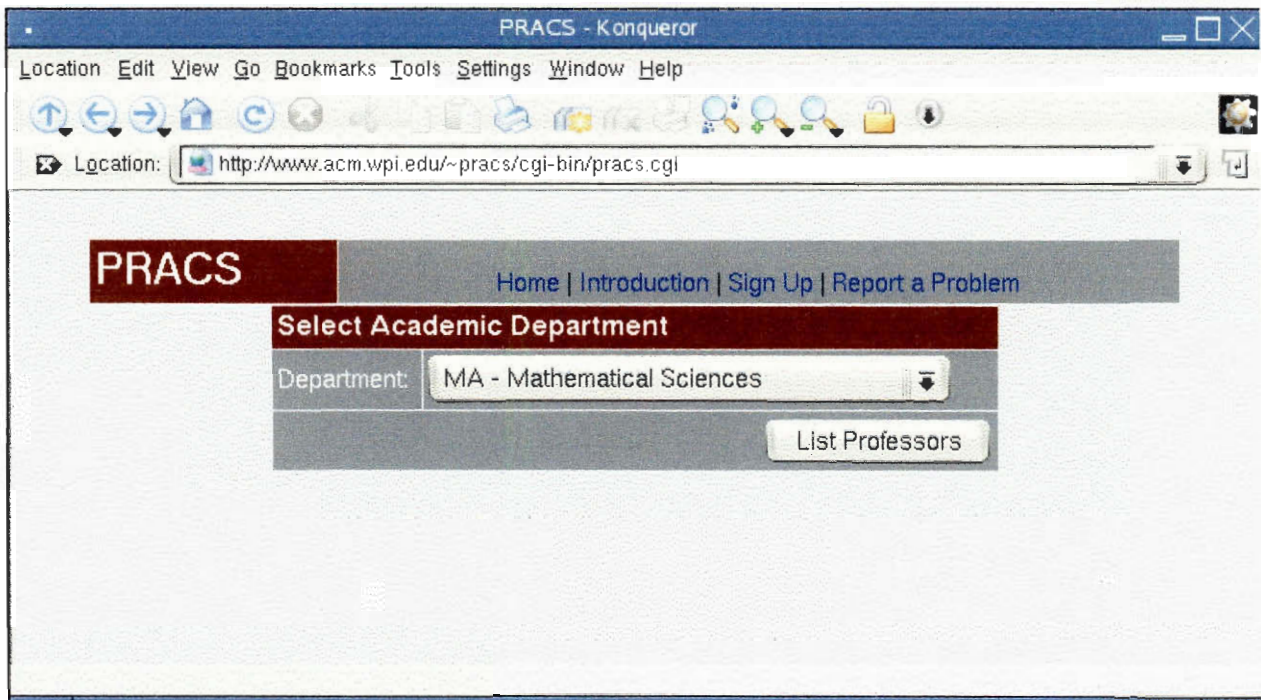


Figure A-2: PRACS Department Selection Screen

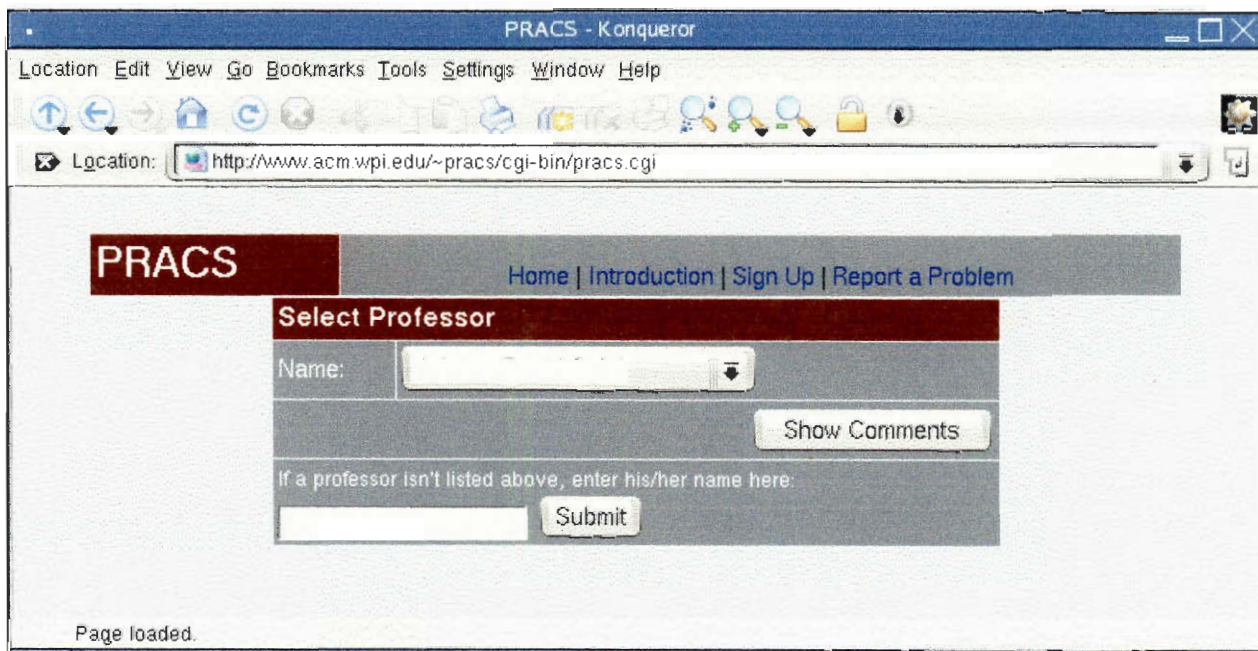


Figure A-3: PRACS Professor Selection Screen

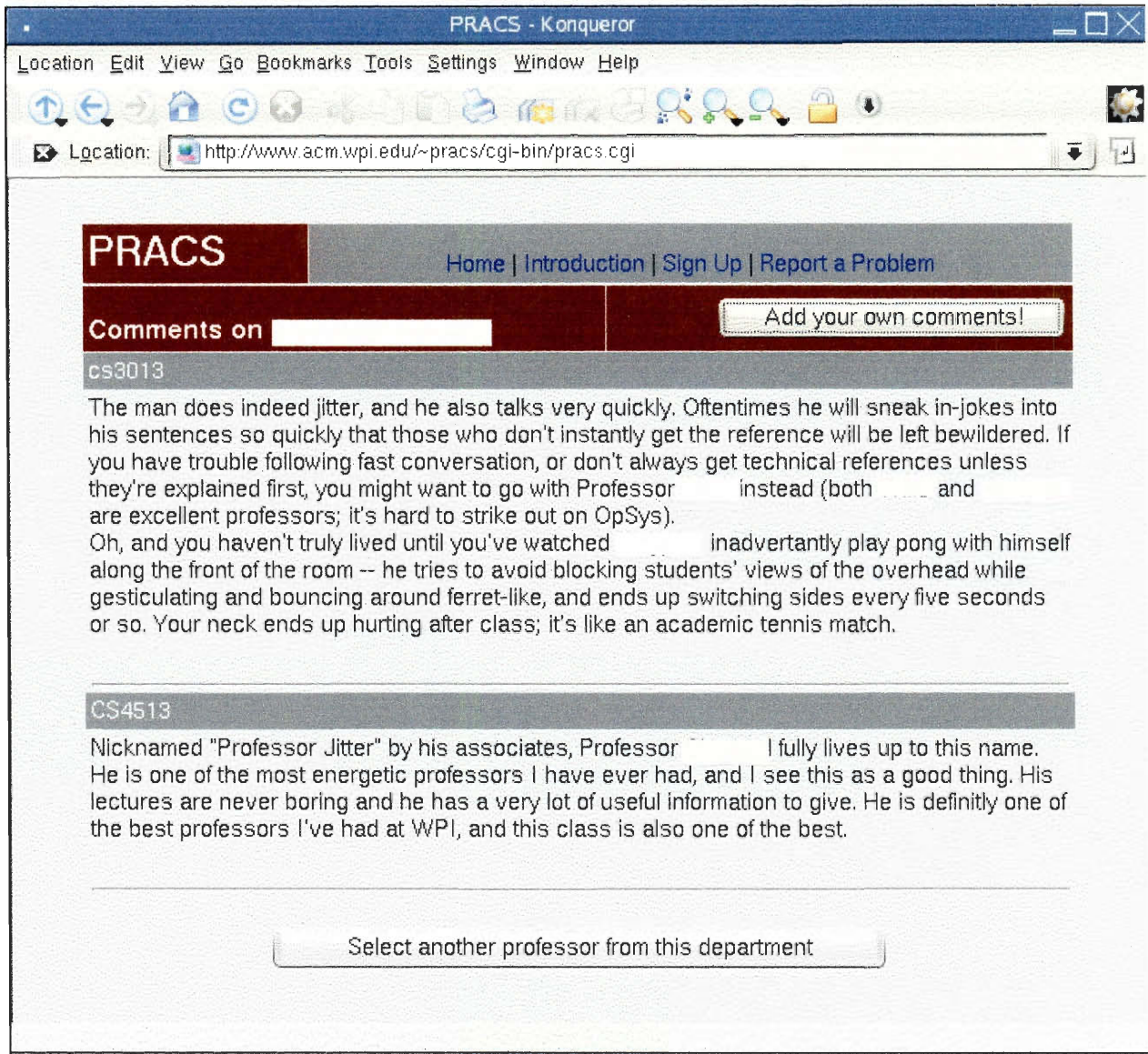


Figure A-4: PRACS Professor Comments Screen

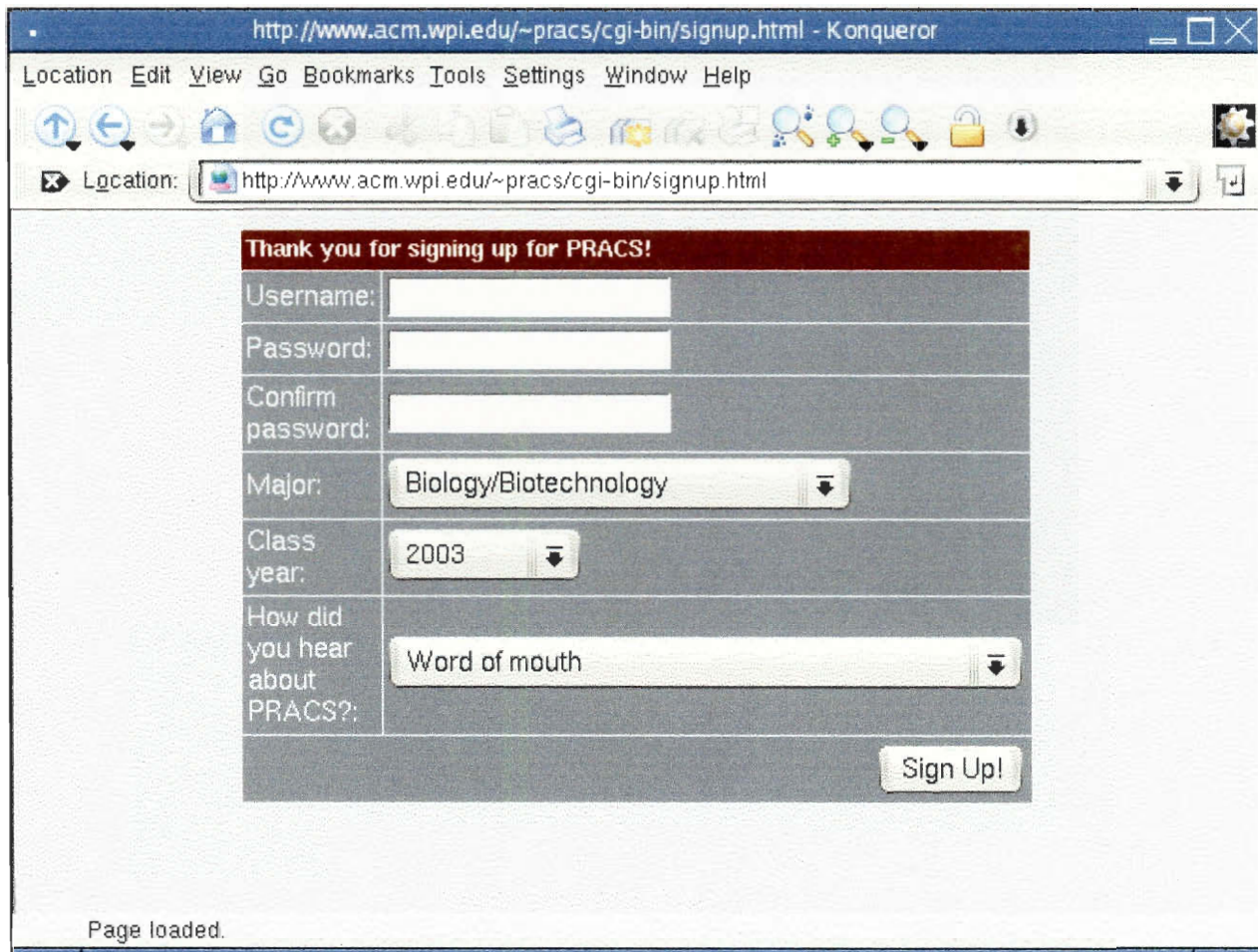


Figure A-5: PRACS Sign-up Screen

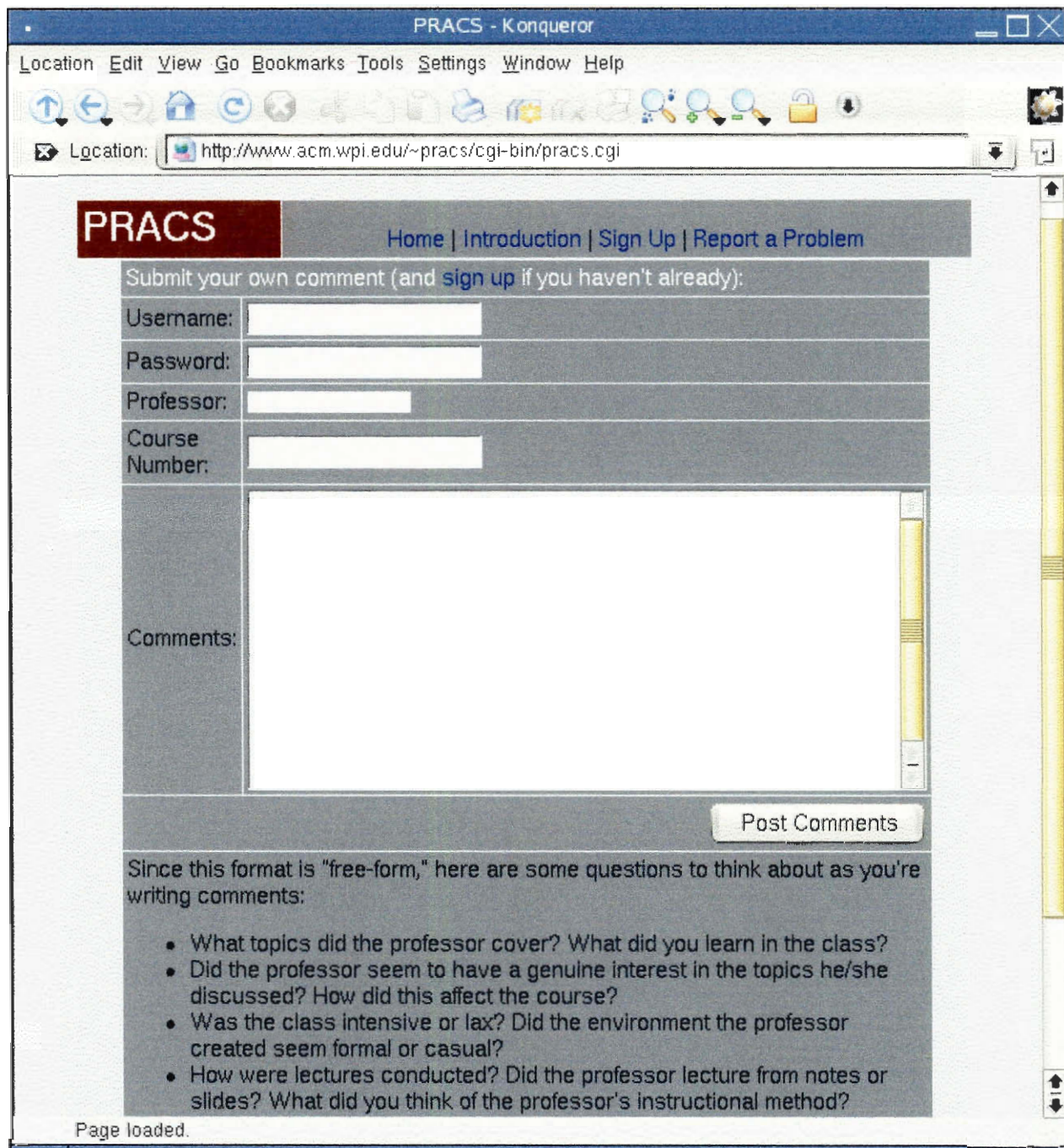


Figure A-6: PRACS Comment Submission Screen

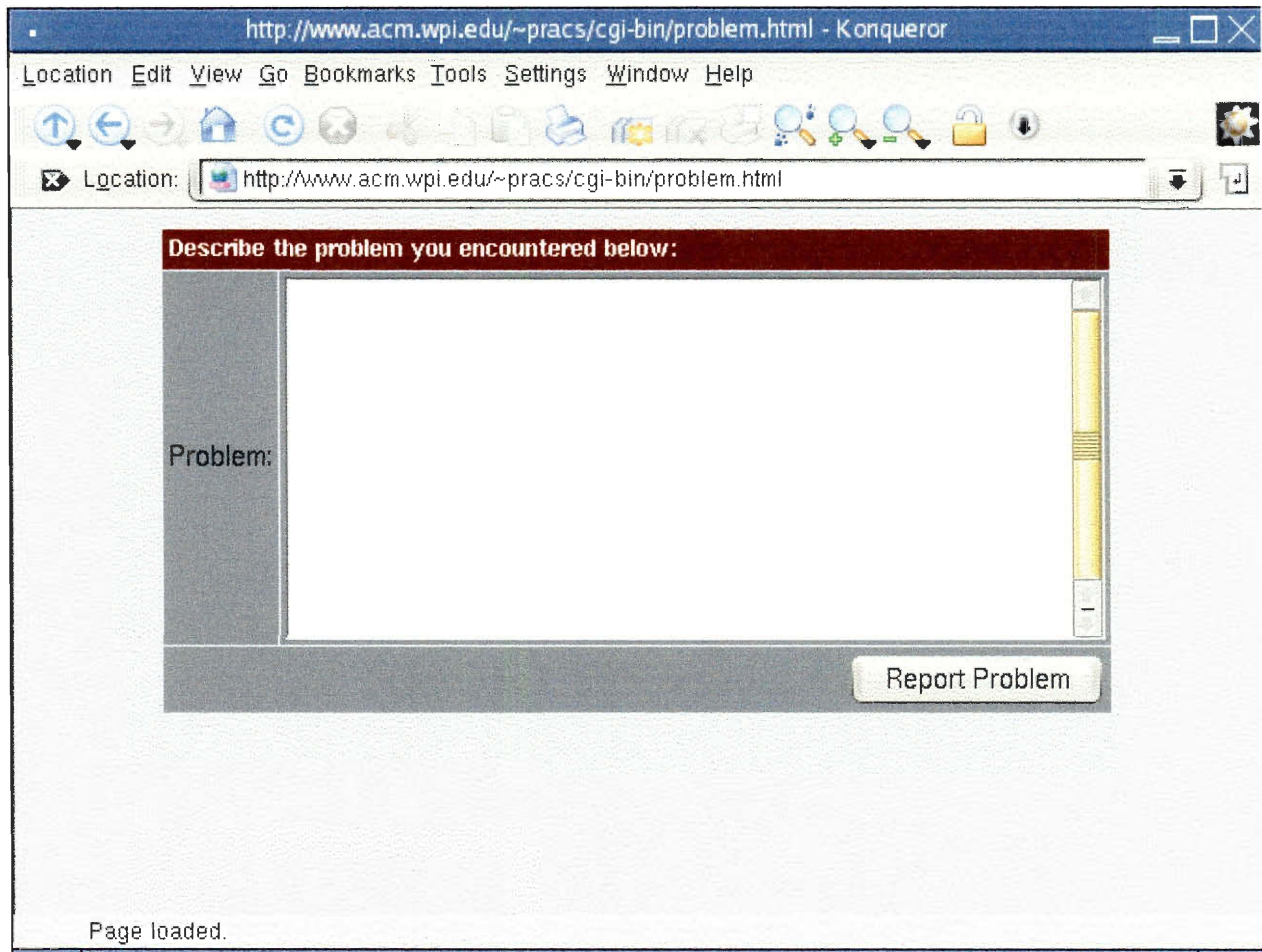


Figure A-7: PRACS Problem Submission Form

Location Edit View Go Bookmarks Tools Settings Window Help

Location: <http://old.universitytools.com/utools/ratings/details.pl?CourseID=1001>

Home Academics [Click here to sign in.](#)

The Ultimate LSU Area Homepage. Monday, May 19, 2003

<< Go back from whence you came

Ratings of EE 3232

Electrical Engineering * Solid State Devices I

Overall Ratings

😊 75% recommended
 😞 25% not recommended

	Avg.	A	B	C	D	E
Communications Skills:	3.0	0	3	0	0	0
Personality:	3.7	2	1	0	0	0
Course Content:	3.7	2	1	0	0	0
Exams and Grading:	3.0	1	1	1	0	0
Amt. of Outside Time Required:	2.7	0	2	1	0	0
OVERALL GPA:	3.2	5	8	2	0	0
What grade did you get?	3.7	2	1	0	0	0

Individual Ratings

The person who submitted this rating earned a A in this class.

Instructor: 😊 **Recommended.**

Course: EE 3232 😞 **Not recommended.**

Communications Skills: B

Personality: A

Course Content: B

Exams and Grading: B

Amt. of Outside Time Required: C

Date Posted: 2002-05-18 22:26:51

Covers good but difficult material. Try to take

The person who submitted this rating earned a B in this class.

Page loaded.

Figure A-8: AroundU.com Comments Screen

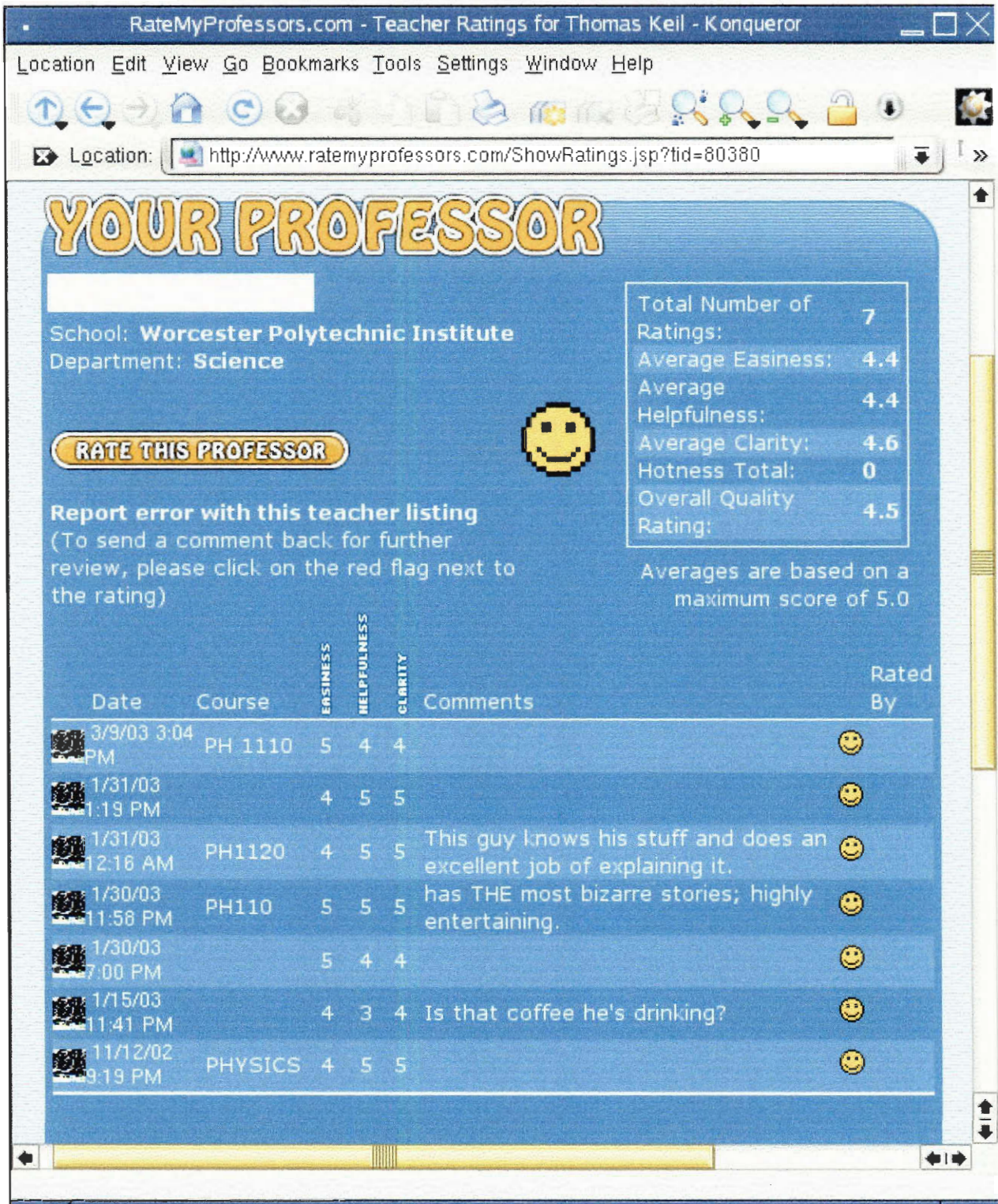


Figure A-9: RateMyProfessors.com Comments Screen

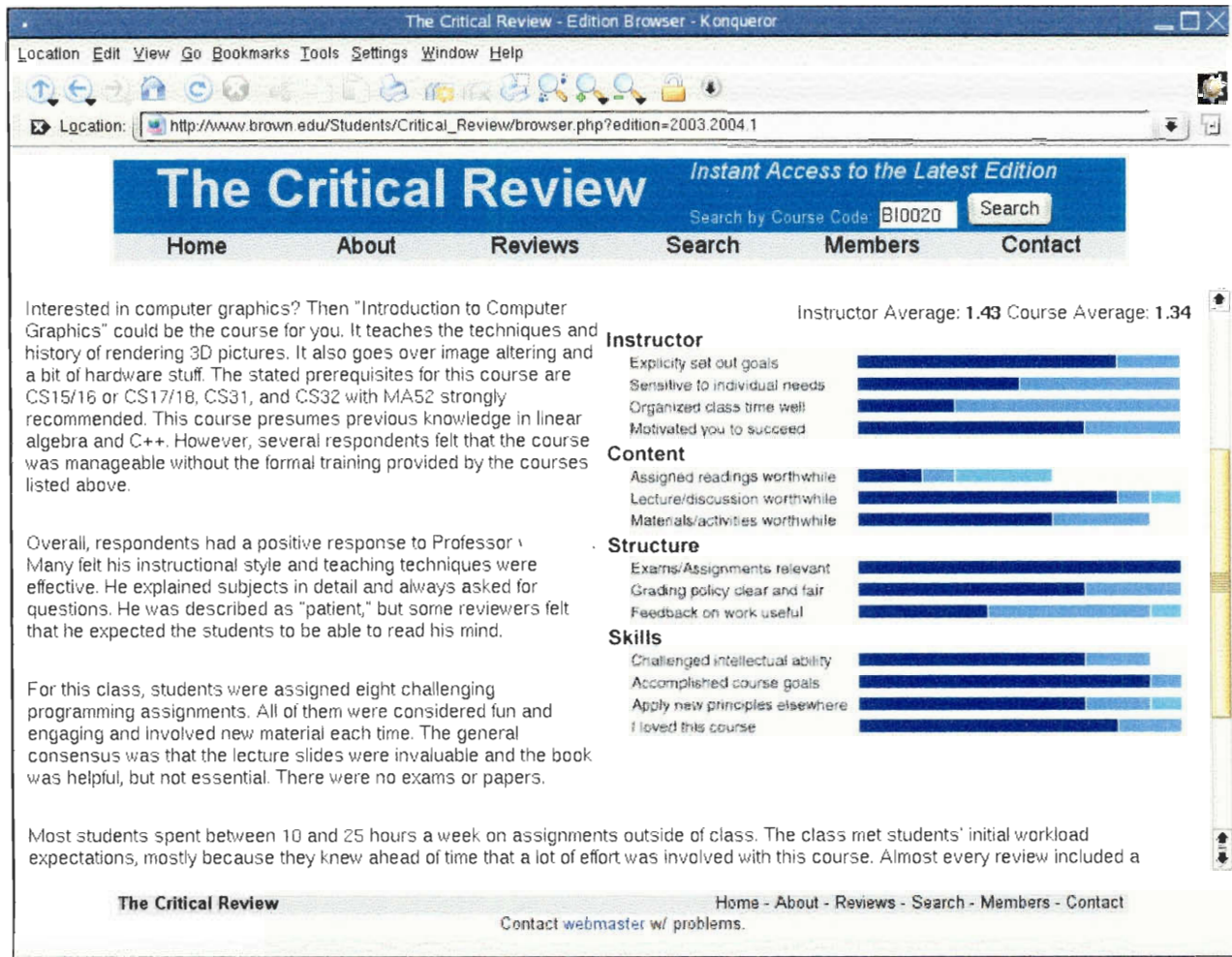


Figure A-10: The Critical Review Comments Screen

6.891 Learning in Worlds with Objects

Machine Learning for Fun and Profit

(2.0-0.0-4.3)

Lecturer:

Response Rate: 10 out of 13

Lecturer's Rating: 6.5/7.0

Difficulty: 4.6/7.0

Overall Rating: 6.3/7.0

Prerequisites: Background in AI, especially at a graduate/research level

Term Evaluated: Spring 2002

Lecturer's Comments:

Most machine-learning techniques assume a representation of states of the problem in terms of vectors of discrete or real-valued attributes. We would like to apply machine learning to more complex situations that humans would describe in terms of the objects that compose them (chairs, tables, books, people). However, it is not clear how to represent such domains in order to afford effective generalization, nor what algorithms to use to learn these more complex representations. This course is a seminar in which we study research papers from related areas and try to develop one or more approaches to representation and learning in worlds with objects.

This class was taken primarily by Course VI-2 and VI-3 graduate students with a few other graduate students and seniors. Students in the class found it to be an excellent survey of the current work in artificial intelligence in the field of learning.

Students found the class to be a good mix of theoretical and practical applications within the field of artificial learning. The papers and discussion were both engaging and informa-

tive. Students interested in conducting research in AI were particularly happy with the class.

Lecturer (6.5/7.0, 10 responses) was universally praised for her engaging lectures. Students found her to be very knowledgeable and able to answer any background questions they had.

This class has no problem sets. Students undertake a large research topic on a topic of their own interest. The project is an extensive assignment and most students found it to be very rewarding. Some students wished that there was more time between the paper being due and an in-class presentation.

There was no textbook for this class. The syllabus consisted of various papers about recent topics in the field. Students found the papers to be interesting and applicable.

Grades in 6.901 are based on readings and a final project.

The project is a SERIOUS undertaking.

What's Hot

- Great papers
- Great lectures

What's Not

- Readings handed out too late to be useful

"Talk about current pressing issues with a bunch of smart people."

Appendix B: Analyzed Data

The following is the output of the pracsdata.cgi Perl script.

Ratemyprofessors:

772 comments total

Average score:11.9598445595855 out of 40 (24 considered a "perfect" score)

Score Distribution:

0-4: 4

4-8: 174

8-12: 296

12-16: 194

16-20: 82

20-24: 19

24+: 2

Data mining:

Maturity Average:

Opinionation of 1: 4.63636363636364

Opinionation of 2: 4.92

Opinionation of 3: 4.89655172413793

Opinionation of 4: 4.98039215686275

Opinionation of 5: 4.96484375

Relevance Average:

Opinionation of 1: 2.38068181818182

Opinionation of 2: 3.01

Opinionation of 3: 2.35632183908046

Opinionation of 4: 2.64052287581699

Opinionation of 5: 1.96875

Spelling/grammar Average:

Opinionation of 1: 4.70454545454545

Opinionation of 2: 4.77

Opinionation of 3: 4.6551724137931

Opinionation of 4: 4.73856209150327

Opinionation of 5: 4.87109375

Attitude Average:

Opinionation of 1: 1.36931818181818

Opinionation of 2: 2.91

Opinionation of 3: 4.64367816091954

Opinionation of 4: 3.03921568627451

Opinionation of 5: 1.5859375

Specificity Average:

Opinionation of 1: 1.97727272727273

Opinionation of 2: 2.46

Opinionation of 3: 2.09195402298851

Opinionation of 4: 2.11111111111111

Opinionation of 5: 1.55078125

Factual Average:

Opinionation of 1: 1.45454545454545

Opinionation of 2: 1.51

Opinionation of 3: 1.27586206896552

Opinionation of 4: 1.2483660130719

Opinionation of 5: 1.14453125

Overall Score Average:

Opinionation of 1: 10.75
Opinionation of 2: 14.08
Opinionation of 3: 14.33333333333333
Opinionation of 4: 13.3071895424837
Opinionation of 5: 10.421875

Number with maturity of 1: 2
Number with maturity of 2: 8
Number with maturity of 3: 16
Number with maturity of 4: 29
Number with maturity of 5: 717

Number with relevance of 1: 252
Number with relevance of 2: 192
Number with relevance of 3: 167
Number with relevance of 4: 104
Number with relevance of 5: 56

Number with spelling of 1: 10
Number with spelling of 2: 3
Number with spelling of 3: 20
Number with spelling of 4: 84
Number with spelling of 5: 654

Number with attitude of 1: 302
Number with attitude of 2: 155
Number with attitude of 3: 141
Number with attitude of 4: 83
Number with attitude of 5: 88

Number with specificity of 1: 387
Number with specificity of 2: 148
Number with specificity of 3: 158
Number with specificity of 4: 51
Number with specificity of 5: 27

Number with factual of 1: 648
Number with factual of 2: 41
Number with factual of 3: 64
Number with factual of 4: 10
Number with factual of 5: 8

Number with opinionation of 1: 176
Number with opinionation of 2: 100
Number with opinionation of 3: 87
Number with opinionation of 4: 153
Number with opinionation of 5: 256

Number with topics question answered: 7
Number with interest question answered: 20
Number with environment question answered: 39
Number with lectures question answered: 30
Number with examples question answered: 1
Number with homeworks question answered: 37
Number with room question answered: 2
Number with style question answered: 12

Underground Guide to Course VI:

72 comments total

Average score: 19.3055555555556 out of 40 (24 considered a "perfect" score)

Score Distribution:

0-4: 1
4-8:
8-12:
12-16: 4
16-20: 44
20-24: 22
24+:

Number with maturity of 1:
Number with maturity of 2:
Number with maturity of 3:
Number with maturity of 4:
Number with maturity of 5: 72

Number with relevance of 1:
Number with relevance of 2: 1
Number with relevance of 3: 2
Number with relevance of 4:
Number with relevance of 5: 69

Number with spelling of 1:
Number with spelling of 2:
Number with spelling of 3:
Number with spelling of 4:
Number with spelling of 5: 72

Number with attitude of 1:
Number with attitude of 2:
Number with attitude of 3: 2
Number with attitude of 4: 1
Number with attitude of 5: 69

Number with specificity of 1: 27
Number with specificity of 2: 18
Number with specificity of 3: 27
Number with specificity of 4:
Number with specificity of 5:

Number with factual of 1: 69
Number with factual of 2: 2
Number with factual of 3: 1
Number with factual of 4:
Number with factual of 5:

Number with opinionation of 1:
Number with opinionation of 2: 1
Number with opinionation of 3: 66
Number with opinionation of 4: 5
Number with opinionation of 5:

Number with topics question answered: 6
Number with interest question answered: 2
Number with environment question answered: 2
Number with lectures question answered: 17
Number with examples question answered: 12
Number with homeworks question answered: 68
Number with room question answered:
Number with style question answered: 1

Critical Review:

97 comments total

Average score:18.6907216494845 out of 40 (24 considered a "perfect" score)

Score Distribution:

0-4:
4-8:
8-12:
12-16: 12
16-20: 64
20-24: 18
24+: 2

Number with maturity of 1:
Number with maturity of 2:
Number with maturity of 3:
Number with maturity of 4:
Number with maturity of 5: 97

Number with relevance of 1:
Number with relevance of 2: 27
Number with relevance of 3: 48
Number with relevance of 4: 16
Number with relevance of 5: 5

Number with spelling of 1:
Number with spelling of 2:
Number with spelling of 3: 1
Number with spelling of 4:
Number with spelling of 5: 96

Number with attitude of 1:
Number with attitude of 2:
Number with attitude of 3: 2
Number with attitude of 4: 9
Number with attitude of 5: 86

Number with specificity of 1: 5
Number with specificity of 2: 32
Number with specificity of 3: 41
Number with specificity of 4: 19
Number with specificity of 5:

Number with factual of 1: 29
Number with factual of 2: 38
Number with factual of 3: 27
Number with factual of 4: 3
Number with factual of 5:

Number with opinionation of 1:
Number with opinionation of 2: 6
Number with opinionation of 3: 79
Number with opinionation of 4: 12
Number with opinionation of 5:

Number with topics question answered: 1
Number with interest question answered: 4
Number with environment question answered: 2
Number with lectures question answered: 92
Number with examples question answered: 2
Number with homeworks question answered: 12
Number with room question answered: 3
Number with style question answered:

PRACS:
28 comments total

Average score:19.7142857142857 out of 40 (24 considered a "perfect" score)

Score Distribution:

0-4:
4-8: 1
8-12: 2
12-16: 3
16-20: 7
20-24: 7
24+: 7

Data mining:

Maturity Average:

Opinionation of 1: 3.2
Opinionation of 2: 3.66666666666667
Opinionation of 3: 5
Opinionation of 4: 4.77777777777778
Opinionation of 5: 5

Relevance Average:

Opinionation of 1: 3.6
Opinionation of 2: 2.66666666666667
Opinionation of 3: 4.85714285714286
Opinionation of 4: 4.77777777777778
Opinionation of 5: 5

Spelling/grammar Average:

Opinionation of 1: 4.2
Opinionation of 2: 3.66666666666667
Opinionation of 3: 4.42857142857143
Opinionation of 4: 3.88888888888889
Opinionation of 5: 4.75

Attitude Average:

Opinionation of 1: 2.2
Opinionation of 2: 3.33333333333333
Opinionation of 3: 4.71428571428571
Opinionation of 4: 4.22222222222222
Opinionation of 5: 3.75

Specificity Average:

Opinionation of 1: 4.2
Opinionation of 2: 3.33333333333333
Opinionation of 3: 3.85714285714286
Opinionation of 4: 4.44444444444444
Opinionation of 5: 4.25

Factual Average:

Opinionation of 1: 2.6
Opinionation of 2: 3
Opinionation of 3: 1.14285714285714
Opinionation of 4: 1.77777777777778
Opinionation of 5: 1.5

Overall Score Average:

Opinionation of 1: 16.4
Opinionation of 2: 15.6666666666667
Opinionation of 3: 22.5714285714286
Opinionation of 4: 20.7777777777778
Opinionation of 5: 22.25

Number with maturity of 1:
Number with maturity of 2:
Number with maturity of 3: 6

Number with maturity of 4: 3
Number with maturity of 5: 19

Number with relevance of 1: 1
Number with relevance of 2: 1
Number with relevance of 3: 3
Number with relevance of 4: 4
Number with relevance of 5: 19

Number with spelling of 1:
Number with spelling of 2: 1
Number with spelling of 3: 4
Number with spelling of 4: 12
Number with spelling of 5: 11

Number with attitude of 1:
Number with attitude of 2: 5
Number with attitude of 3: 7
Number with attitude of 4: 4
Number with attitude of 5: 12

Number with specificity of 1:
Number with specificity of 2: 1
Number with specificity of 3: 10
Number with specificity of 4: 2
Number with specificity of 5: 15

Number with factual of 1: 18
Number with factual of 2: 2
Number with factual of 3: 5
Number with factual of 4:
Number with factual of 5: 3

Number with opinionation of 1: 5
Number with opinionation of 2: 3
Number with opinionation of 3: 7
Number with opinionation of 4: 9
Number with opinionation of 5: 4

Number with topics question answered: 6
Number with interest question answered: 4
Number with environment question answered: 3
Number with lectures question answered: 17
Number with examples question answered:
Number with homeworks question answered: 11
Number with room question answered: 1
Number with style question answered: 4

AroundU:

171 comments total

Average score:10.8947368421053 out of 40 (24 considered a "perfect" score)

Score Distribution:

0-4: 2
4-8: 53
8-12: 61
12-16: 42
16-20: 11
20-24: 1
24+:

Number with maturity of 1:
Number with maturity of 2: 3

Number with maturity of 3: 7
Number with maturity of 4: 7
Number with maturity of 5: 154

Number with relevance of 1: 92
Number with relevance of 2: 35
Number with relevance of 3: 24
Number with relevance of 4: 6
Number with relevance of 5: 14

Number with spelling of 1: 2
Number with spelling of 2: 4
Number with spelling of 3: 14
Number with spelling of 4: 26
Number with spelling of 5: 125

Number with attitude of 1: 85
Number with attitude of 2: 22
Number with attitude of 3: 38
Number with attitude of 4: 6
Number with attitude of 5: 20

Number with specificity of 1: 81
Number with specificity of 2: 49
Number with specificity of 3: 33
Number with specificity of 4: 5
Number with specificity of 5: 3

Number with factual of 1: 144
Number with factual of 2: 16
Number with factual of 3: 10
Number with factual of 4:
Number with factual of 5:

Number with opinionation of 1: 36
Number with opinionation of 2: 19
Number with opinionation of 3: 29
Number with opinionation of 4: 30
Number with opinionation of 5: 57

Number with topics question answered: 6
Number with interest question answered: 1
Number with environment question answered: 2
Number with lectures question answered: 5
Number with examples question answered:
Number with homeworks question answered: 21
Number with room question answered: 1
Number with style question answered: 3

Appendix C: Source Code and Comment Database

C.1 PRACS system code

```
#!/usr/bin/perl
use DBI;

#####
# pracs.cgi designed and coded by Colin Bourassa
# and Frank Gerratana, for the PRACS IQP in
# 2002-2003
# http://www.acm.wpi.edu/~pracs/

# Set up the date and time
$date = `date +%Y-%m-%d`;
$time = `date +%T`;
chomp($date);
chomp($time);

#####
# Database Setup

our $dbhhandle;

#####
# Form Setup

read(STDIN, $buffer, $ENV{'CONTENT_LENGTH'});

@pairs = split(/&/, $buffer);

foreach $pair (@pairs)
{
    ($name, $value) = split(/=/, $pair);

    $value =~ tr/+//;
    $value =~ s/%([a-fA-F0-9][a-fA-F0-9])/pack("C", hex($1))/eg;

    $FORM{$name} = $value;
}

#####
# Main logic

if ($FORM{newcomments}) {
    &set_cookie;
}

&HTMLBegin;
if ($FORM{signup}) {
    &Signup;
}
elseif ($FORM{commentform}) {
    &CommentForm;
}
elseif ($FORM{newcomments}) {
    &CommentSubmit;
}
elseif ($FORM{dept}) {
    &ProfForm;
}
elseif ($FORM{prof}) {
    &DisplayProfComments;
}
elseif ($FORM{profreq}) {
    &ProfReq;
}
elseif ($FORM{problem}) {
    &Problem;
}
else {
    &DeptForm;
    &AddAccess;
}
&HTMLEnd;

#####
# Functions
```

```

# Connect to the database
sub DBConnect {

my $user = "*****"; # Hidden for publication
my $pass = "*****"; # Hidden for publication
my $dbname = "DBI:mysql:database=pracs;host=mysql.wpi.edu;port=3306";

$dbhandle = DBI->connect($dbname, $user, $pass)
    or die "Could not connect to DB: " . DBI->errstr;

}

# Start of each page
sub HTMLBegin {

print "Content-type: text/html \n\n";

print<<HEADEREND;
<html>
<head><title>PRACS</title></head>
<body bgcolor=#E0E0E0>
<center>
<P><TABLE BORDER=0 CELLSPACING=1 CELLPADDING=3 WIDTH="90%">
  <TR>
    <TD COLSPAN=2 bgcolor=#800000>
      <H1><FONT FACE="Tahoma,Helvetica" color=white>PRACS</FONT></H1>
    </TD><TD COLSPAN=2 bgcolor=#808080>
      <P><CENTER><FONT
        FACE="Tahoma,Helvetica"><A HREF="http://www.acm.wpi.edu/~pracs/cgi-bin/pracs.cgi">Home</A></FONT><FONT
        FACE="Tahoma,Helvetica"> | </FONT><FONT
        FACE="Tahoma,Helvetica"><A HREF="http://www.acm.wpi.edu/~pracs/">Introduction</A></FONT><FONT
        FACE="Tahoma,Helvetica"> | </FONT><FONT
        FACE="Tahoma,Helvetica"><A HREF="http://www.acm.wpi.edu/~pracs/cgi-bin/signup.html">Sign Up</A><FONT
        FACE="Tahoma,Helvetica"> | </FONT><FONT
        FACE="Tahoma,Helvetica"><A HREF="http://www.acm.wpi.edu/~pracs/cgi-bin/problem.html">Report
Problem</A></FONT></CENTER>
      </TD></TR>
</TABLE></P>
HEADEREND

}

# End of each page
sub HTMLEnd {

print "</center>\n";
print "</body>\n";
print "</html>\n";

}

sub Signup {
  # signup==yes
  &DBConnect;

  if ($FORM{username} && $FORM{password}) {

    $formusername=$FORM{username};
    # Do some input checking

    if (($formusername =~ /\|/) || ($formusername =~ /\//) || ($formusername =~ /\\\/) ) {
      print qq(Your username contains characters that cannot be used with this system. Please remove them and
try again.);
    }

    else {

      $checklogin = $dbhandle->prepare("SELECT * FROM users WHERE username='$FORM{username}'");
      $checklogin->execute();
      @auser=$checklogin->fetchrow_array;

      if (@auser) {
        print qq(Sorry, that username is already taken.);
      }
      elsif ($FORM{password} eq $FORM{password2}) {
        $newlogin = $ dbhandle->prepare("INSERT INTO users ( username, password, major, year, hear, signup )
VALUES ( '$formusername', '$FORM{password}', '$FORM{major}', '$FORM{year}', '$FORM{hear}', '$date $time' )");
        $newlogin->execute();
        print qq(<H3>Thanks for signing up, $formusername!</H3>);
      }
      else {
        print qq(The passwords you entered didn't match.);
      }
    }
  }
}

```

```

    }
  }
}
else {
  print qq(You need to choose a username and password.);
}
}

# Given a professor, have a form to add a comment on him/her
sub CommentForm {

  my $cookie = $ENV{'HTTP_COOKIE'};

  my @somecookies = split(/, /, $cookie);

  foreach $onecookie (@somecookies) {
    if ($onecookie =~ /userpass/) {
      my @ourcookie = split(/=/, $onecookie);
      $userpass = $ourcookie[1];
    }
  }

  ($username, $password)=split(/\|/, $userpass);

  print<<CFEND
<form name="PRACSF0RM" action="pracs.cgi" method=POST>
<table cellpadding=1 cellspacing=3 border=0 width=80%>
<tr>
  <td bgcolor=#808080 colspan=2>
    <font face="Tahoma,Helvetica" color=white>Submit your own comment (and <A
    HREF="signup.html" target=_blank>sign up</A> if you haven't already):
  <tr><td bgcolor=#808080>Username:</td>
  <td bgcolor=#808080><input type="text" name="username" value="$username"></td></tr>
  <tr><td bgcolor=#808080>Password:</td>
  <td bgcolor=#808080><input type="password" name="password"
  value="$password"></td></tr>
  <tr><td bgcolor=#808080>Professor:</td>
  <td bgcolor=#808080>${FORM{'professor'}}</td></tr>
  <tr><td bgcolor=#808080>Course Number:</td>
  <td bgcolor=#808080><input type="text" name="number" maxlength=6></td></tr>
  <tr><td bgcolor=#808080>Comments:</td><td bgcolor=#808080>
  <textarea rows=12 cols=60 name="comments"></textarea>
  </font>
  </td>
</tr>
<tr>
  <td bgcolor=#808080 colspan=2>
    <input type="hidden" name="department" value="${FORM{'department'}}">
    <input type="hidden" name="professor" value="${FORM{'professor'}}">
    <input type="hidden" name="newcomments" value="yes">
    <input type="submit" align=right value="Post Comments">
  </td>
</tr>
<tr>
  <td bgcolor=#808080 colspan=2>
    <p>Since this format is "free-form," here are some questions to think about as you're
    writing comments:</p>
    <UL>
    <LI>What topics did the professor cover? What did you learn in the class?
    <LI>Did the professor seem to have a genuine interest in the topics he/she discussed?
    How did this affect the course?
    <LI>Was the class intensive or lax? Did the environment the professor created seem
    formal or casual?
    <LI>How were lectures conducted? Did the professor lecture from notes or slides? What
    did you think of the professor's instructional method?
    <LI>Did you think the professor used the proper amount of examples or demonstrations
    during lectures?
    <LI>What did you think of the professors homeworks, tests, and projects?
    <LI>Was the class in a large lecture hall or a small classroom? Did you feel the
    professor worked well with the class size?
    <LI>What type of student do you think would benefit most from this professor's style
    of instruction?
    </UL>
  </td>
</tr>
</form>
CFEND

```



```

}

# Given the comment form, put a comment into the database
sub CommentSubmit {

    #newcomments ==yes

    &DBConnect;

    $formcomments = $FORM{comments};
    $formcomments =~ s/\n\r\n/<P>/g;
    $formcomments =~ s/\n/<BR>/g;

    $formcomments =~ s/\n//g;
    $formcomments =~ s/\r//g;

    $formcomments =~ s/\\/\\\\/g;
    $formcomments =~ s/'/\\'/g;

    $login = $dbh->prepare("SELECT * FROM users WHERE username='$FORM{username}'");
    $login->execute();
    @thisuser=$login->fetchrow_array;
    if ($thisuser[2] eq $FORM{password}) {

        if ($FORM{comments} eq "") {
            print qq(Please go back and enter some comments.)
        }
        elsif ($FORM{number} && $FORM{professor} && $FORM{username}) {

            $formprofessor_clean = $FORM{professor};
            $formprofessor_clean =~ s/\'/\\\'/;
            $aprof = $dbh->prepare("SELECT initials FROM professors WHERE
displayname='$formprofessor_clean'");
            $aprof->execute();
            ($profinitials)=$aprof->fetchrow_array;

            $newcomm = $dbh->prepare("INSERT INTO comments ( number, prof, student, ipaddy, timestamp, hidden,
comments ) VALUES ( '$FORM{number}', '$profinitials', '$FORM{username}', '$ENV{REMOTE_ADDR}', '$date $time',
'show', '$formcomments' )");
            $newcomm->execute();
            print qq(<H3>Thanks for your comment!</H3>);
            print qq(<form name="PRACSFORM" action="pracs.cgi" method=POST>
                <input type="hidden" name="prof" value="yes">
                <input type="hidden" name="professor" value="$FORM{professor}">
                <input type="hidden" name="department" value="$FORM{department}">
                <input type="submit" value="Return to $FORM{professor}"></form>
            );

        }
        else {
            print qq(Error number 1337);
        }

    }
    elsif (@thisuser=0) {
        print qq(Sorry, that username was not found. Be sure to <A HREF="signup.html" target=_blank>sign up</A> if
you haven't already.);
    }
    else {
        print qq(Sorry, that password is incorrect.);
    }

}

# Choose a department
sub DeptForm {

    # this is the entry point for the script

    # display form

    print<<ENDDPTFORM;
    <form name="PRACSFORM" action="pracs.cgi" method=POST>
    <table cellspacing=1 cellpadding=3 border=0 width=60%>
        <tr>
            <td bgcolor=#800000 colspan=2><font face="Tahoma,Helvetica" color=white><h3>Select Academic
Department</h3></font></td>
            </tr>
            <tr>
                <td bgcolor=#808080><font face="Tahoma,Helvetica" color=white>Department:</td>
                <td bgcolor=#808080>

```

```

                <select name="department">
<option>BB - Biology and Biotechnology
<option>BE - Biomedical Engineering
<option>CE - Civil and Environmental Engineering
<option>CH - Chemistry and Biochemistry
<option>CM - Chemical Engineering
<option>CS - Computer Science
<option>EE - Electrical and Computer Engineering
<option>FP - Fire Protection Engineering
<option>HU - Humanities
<option>MA - Mathematical Sciences
<option>ME - Mechanical Engineering
<option>MG - Management
<option>PH - Physics
<option>SS - Social Science and Policy Studies
                </select>
            </td>
        </tr>
        <tr>
            <td bgcolor=#808080 colspan=2>
                <input type="hidden" name="dept" value="yes">
                <input type="submit" align=right value="List Professors">
            </td>
        </tr>
    </table>
</form>
ENDEPTFORM
}

# Choose a professor
sub ProfForm {
    # if dept==yes
    &DBConnect;

    # I love Perl:
    ($department) = split(/ - /, $FORM{department});

    $prof = $dbh->prepare("SELECT displayname FROM professors WHERE dept='$department' ORDER BY displayname
ASC");
    $prof->execute();
    $profs=$prof->fetchall_arrayref;

    # display form
    print<<ENDPROFFORM;
    <table cellpadding=1 cellspacing=3 border=0 width=60%>
        <tr>
            <td bgcolor=#800000 colspan=2><font face="Tahoma,Helvetica" color=white><h3>Select
Professor</h3></font></td>
        </tr>
        <tr><form name="PRACFORM" action="pracs.cgi" method=POST>
            <td bgcolor=#808080><font face="Tahoma,Helvetica" color=white>Name:</td>
            <td bgcolor=#808080>
                <select name="professor">
ENDPROFFORM
        </td>
        </tr>
        <tr>
            <td colspan=2>
                <input type="hidden" name="prof" value="yes">
            </td>
        </tr>
    </table>
}

for $aprof (@$profs) {
    $aprof_clean = $aprof->[0];
    $aprof_clean =~ s/\`/\\/;
    $aprofi = $dbh->prepare("SELECT initials FROM professors WHERE displayname='$aprof_clean'");
    $aprofi->execute();
    ($aprofinitials)=$aprofi->fetchrow_array;

    $profnum = $dbh->prepare("SELECT id FROM comments WHERE prof='$aprofinitials' AND hidden='show'");
    $profnum->execute();
    $profar=$profnum->fetchall_arrayref;

    $numcomments = @$profar;

    print "<option>$aprof->[0] ($numcomments)";
}

print<<ENDPROFFORM2;
                </select>
            </td>
        </tr>
        <tr>
            <td bgcolor=#808080 colspan=2>
                <input type="hidden" name="prof" value="yes">
            </td>
        </tr>
    </table>
}

```

```

                <input type="hidden" name="department" value="$department">
                <input type="submit" align=right value="Show Comments">
            </td>
        </form>
    </tr>
    <tr>
        <td bgcolor=#808080 colspan=2><form name="PRACSF0RM2" action="pracs.cgi" method=POST>
            <font face="Tahoma,Helvetica" color=white size=-1>If a professor isn't listed above, enter his/her
name here:</font>
            <input type="text" name="profreq" maxlength=200>
            <input type="hidden" name="deptreq" value="$department">
            <input type="submit" value="Submit">
        </form></td>
    </tr>
</table>

ENDPROFF0RM2

}

# Given a professor, display his comments
# Also allow a new comment for this professor
sub DisplayProfComments {

    &DBConnect;

    ($formprofessor) = (split/ \(/, $FORM{professor});

    $formprofessor_clean = $formprofessor;
    $formprofessor_clean =~ s/\\/\\/\\/;
    $aprof = $dbh->prepare("SELECT initials FROM professors WHERE displayname='$formprofessor_clean'");
    $aprof->execute();
    ($profinitials)=$aprof->fetchrow_array;

    $aprofcourses = $dbh->prepare("SELECT DISTINCT number FROM comments WHERE prof='$profinitials' AND
hidden='show' ORDER BY number ASC");
    $aprofcourses->execute();
    $profcourses=$aprofcourses->fetchall_arrayref;

print<<ENDDISP;
<table cellspacing=1 cellpadding=3 border=0 width=90%>
    <tr>
        <form name="PRACSF0RM" action="pracs.cgi" method=POST>
            <td bgcolor=#800000><font face="Tahoma,Helvetica" color=white><noBr><h3>Comments on
$formprofessor</h3></noBr></font></td>
            <td bgcolor=#800000><input type="hidden" name="professor" value="$formprofessor">
            <input type="hidden" name="department" value="$FORM{department}">
            <input type="hidden" name="commentform" value="yes"><input type="submit" align=right
value="Add your own comments!"></td>
        </form>
    </tr>
ENDDISP

    for $course (@$profcourses) {
        print qq(<tr><td bgcolor=#808080 colspan=2><font face="Tahoma,Helvetica" color=white>$course-
>[0]</td></tr>);
        $thiscourse = $dbh->prepare("SELECT comments FROM comments WHERE number='$course->[0]' AND
prof='$profinitials' AND hidden='show'");
        $thiscourse->execute();
        $thiscoursecomments=$thiscourse->fetchall_arrayref;

        for $thiscomm (@$thiscoursecomments) {
            print qq(<tr><td bgcolor=#E0E0E0 colspan=2><font face="Tahoma,Helvetica">$thiscomm-
>[0]<P><HR></td></tr>);
        }
    }

    if (@$profcourses==0) {
        print qq(<tr><td bgcolor=#800000 colspan=2><font face="Tahoma,Helvetica" color=white><h3>No comments
entered for this professor - you can be the first!</h3></font></td></tr>);
    }

print<<ENDDISP2;
<tr><td colspan=2><p><form name="PRACSF0RM" action="pracs.cgi" method=POST>
    <input type="hidden" name="dept" value="yes">
    <input type="hidden" name="department" value="$FORM{department}">
    <center><input type="submit" value="Select another professor from this
department"></center></form>
</td></tr>
</table>
ENDDISP2

```

```

}

# Request a professor to be added to the system, via email
sub ProfReq {

    open (MAIL, "|/usr/sbin/sendmail frankg") || die "It didn't work: $! \n";
    print MAIL "Subject: PROFESSOR request \n\n";
    print MAIL "From $ENV{'REMOTE_ADDR'} for $FORM{deptreq}: $FORM{profreq}\n\n";
    close (MAIL);

    print qq(<H3>Thanks for your request!</H3><P>We'll add that professor to the system shortly.</P>);
}

# Report a problem via email
sub Problem {

    open (MAIL, "|/usr/sbin/sendmail frankg") || die "It didn't work: $! \n";
    print MAIL "Subject: PRACS problem \n\n";
    print MAIL "From $ENV{'REMOTE_ADDR'}: $FORM{problem}\n\n";
    close (MAIL);

    print qq(<H3>Thanks for reporting the problem.</H3><P>We'll get on it right away.</P>);
}

# Add a site access to the database
sub AddAccess {

    &DBConnect;

    $getaccesses = $dbh->prepare("SELECT accesses FROM access WHERE ip='$ENV{REMOTE_ADDR}'");
    $getaccesses->execute();
    ($accesses)=$getaccesses->fetchrow_array;

    if ($accesses>0) {
        $accesses++;
        $addaccess = $dbh->prepare("UPDATE access SET accesses=$accesses WHERE ip='$ENV{REMOTE_ADDR}'");
        $addaccess->execute();
    }
    else {
        $addip = $dbh->prepare("INSERT INTO access ( accesses, ip ) VALUES ( 1, '$ENV{REMOTE_ADDR}' );");
        $addip->execute();
    }
}

# Set the login cookie
# Stores username and password
sub set_cookie {

    $cookiedomain = "acm.wpi.edu";
    $expires = "Fri, 7-Mar-2005 00:00:00 GMT";

    # get the script path and remove the script name
    my $path = $ENV{'SCRIPT_NAME'};
    $path =~ s|/[^/]+$||;

    $cookie = "Set-Cookie:          userpass=$FORM{username}|$FORM{password}; password=$FORM{password};
domain=$cookiedomain; path=$path; expires=$expires;\n";

    print $cookie;
}

```

C.2 PRACS data collection and analysis code

```
#!/usr/bin/perl

#####
# pracsdata.cgi designed and coded by Colin
# Bourassa and Frank Gerratana, for the PRACS IQP
# in 2002-2003
# http://www.acm.wpi.edu/~pracs/

$systemnames{critical}="The Critical Review";
$systemnames{underground}="The Underground Guide to Course VI";
$systemnames{aroundu}="AroundU.com";
$systemnames{ratemyprofessors}="RateMyProfessors.com";
$systemnames{pracs}="PRACS";

#####
# Form Setup

read(STDIN, $buffer, $ENV{'CONTENT_LENGTH'});

@pairs = split(/&/, $buffer);

foreach $pair (@pairs)
{
    ($name, $value) = split(/=/, $pair);

    $value =~ tr/+// ;
    $value =~ s/%([a-fA-F0-9]{a-fA-F0-9})/pack("C", hex($1))/eg;

    $FORM{$name} = $value;
}

#####
# Main logic

&HTMLBegin;
if ($FORM{entercomment}) {
    &EnterCommentForm;
}
elsif ($FORM{data}) {
    &DataMiner;
}
elsif ($FORM{system}) {
    &AddData;
    &EnterCommentForm;
}
else {
    &SelectSystem;
}
&HTMLEnd;

sub AddData {

    open(DATAFILE, ">>datafile.txt");
    print DATAFILE "$FORM{system}|";
    print DATAFILE "$FORM{maturity}|";
    print DATAFILE "$FORM{relevance}|";
    print DATAFILE "$FORM{spelling}|";
    print DATAFILE "$FORM{attitude}|";
    print DATAFILE "$FORM{specificity}|";
    print DATAFILE "$FORM{factual}|";
    print DATAFILE "$FORM{opinionation}|";
    print DATAFILE "$FORM{topics}|";
    print DATAFILE "$FORM{interest}|";
    print DATAFILE "$FORM{environment}|";
    print DATAFILE "$FORM{lectures}|";
    print DATAFILE "$FORM{examples}|";
    print DATAFILE "$FORM{homeworks}|";
    print DATAFILE "$FORM{room}|";
    print DATAFILE "$FORM{style}|";
    print DATAFILE "\n";
    close(DATAFILE);

}

sub SelectSystem {

print<<SELSYS;

<FORM action="pracsdata.cgi" method="POST">
```

```
<P><CENTER><INPUT TYPE="hidden" NAME="entercomment" VALUE="yes">Choose
the system that you're evaluating;</CENTER></P>
```

```
<P><CENTER><INPUT TYPE="submit" NAME="critical"
VALUE="The Critical Review"></CENTER></P>
```

```
<P><CENTER><INPUT TYPE="submit" NAME="underground"
VALUE="The Underground Guide to Course VI"></CENTER></P>
```

```
<P><CENTER><INPUT TYPE="submit" NAME="aroundu" VALUE="AroundU.com">
</CENTER></P>
```

```
<P><CENTER><INPUT TYPE="submit" NAME="ratemyprofessors"
VALUE="RateMyProfessors.com"></CENTER></P>
```

```
<P><CENTER><INPUT TYPE="submit" NAME="pracs" VALUE="PRACS">
</CENTER></P>
</FORM>
```

```
<FORM action="pracsdata.cgi" method="POST">
<INPUT TYPE="hidden" NAME="data" VALUE="yes">
<CENTER><INPUT TYPE="submit" VALUE="See data analysis">
</CENTER></P>
</FORM>
```

```
SELSYS
```

```
}
```

```
sub EnterCommentForm {
```

```
$formsystem=$FORM{system};
$formsystem="critical" if $FORM{critical};
$formsystem="underground" if $FORM{underground};
$formsystem="aroundu" if $FORM{aroundu};
$formsystem="ratemyprofessors" if $FORM{ratemyprofessors};
$formsystem="pracs" if $FORM{pracs};
```

```
print<<CFEND;
```

```
<FORM action="pracsdata.cgi" method="POST">
```

```
<H2><INPUT TYPE="hidden" NAME="system" VALUE="$formsystem"></H2>
```

```
<H2>Evaluating comment on $systemnames{$formsystem}</H2>
```

```
<H2>Rubrics:</H2>
```

```
<H4>Maturity</H4>
```

```
<P><INPUT TYPE="radio" NAME="maturity" VALUE="1"> 1: Includes much
vulgarity and/or severe personal attacks<BR>
```

```
<INPUT TYPE="radio" NAME="maturity" VALUE="2"> 2<BR>
```

```
<INPUT TYPE="radio" NAME="maturity" VALUE="3"> 3: One or two
instances of mild vulgarity and/or character criticism<BR>
```

```
<INPUT TYPE="radio" NAME="maturity" VALUE="4"> 4<BR>
```

```
<INPUT TYPE="radio" NAME="maturity" VALUE="5"> 5: No instances of
vulgarity and no personal attacks</P>
```

```
<H4>Relevance</H4>
```

```
<P><INPUT TYPE="radio" NAME="relevance" VALUE="1"> 1: Little to no
discussion of the professor with regards to academics<BR>
```

```
<INPUT TYPE="radio" NAME="relevance" VALUE="2"> 2<BR>
```

```
<INPUT TYPE="radio" NAME="relevance" VALUE="3"> 3: Inclusion of some
impertinent information<BR>
```

```
<INPUT TYPE="radio" NAME="relevance" VALUE="4"> 4<BR>
```

```
<INPUT TYPE="radio" NAME="relevance" VALUE="5"> 5: Completely
relevant comments</P>
```

```
<H4>Spelling & grammar</H4>
```

```
<P><INPUT TYPE="radio" NAME="spelling" VALUE="1"> 1: Numerous glaring
spelling & grammar errors<BR>
```

<INPUT TYPE="radio" NAME="spelling" VALUE="2"> 2

<INPUT TYPE="radio" NAME="spelling" VALUE="3"> 3: Several minor or a couple major errors

<INPUT TYPE="radio" NAME="spelling" VALUE="4"> 4

<INPUT TYPE="radio" NAME="spelling" VALUE="5"> 5: No spelling or grammar errors</P>

<H4>Attitude/tone</H4>

<P><INPUT TYPE="radio" NAME="attitude" VALUE="1"> 1: Very polarized/biased in tone

<INPUT TYPE="radio" NAME="attitude" VALUE="2"> 2

<INPUT TYPE="radio" NAME="attitude" VALUE="3"> 3: Subtle indication of polarization/bias

<INPUT TYPE="radio" NAME="attitude" VALUE="4"> 4

<INPUT TYPE="radio" NAME="attitude" VALUE="5"> 5: Completely neutral in tone</P>

<H4>Specificity</H4>

<P><INPUT TYPE="radio" NAME="specificity" VALUE="1"> 1: No references to aspects of course that would influence a decision

<INPUT TYPE="radio" NAME="specificity" VALUE="2"> 2

<INPUT TYPE="radio" NAME="specificity" VALUE="3"> 3: Specifiers included for some statements

<INPUT TYPE="radio" NAME="specificity" VALUE="4"> 4

<INPUT TYPE="radio" NAME="specificity" VALUE="5"> 5: All statements include specifiers</P>

<H4>Factual examples</H4>

<P><INPUT TYPE="radio" NAME="factual" VALUE="1"> 1: No examples of events in the course

<INPUT TYPE="radio" NAME="factual" VALUE="2"> 2

<INPUT TYPE="radio" NAME="factual" VALUE="3"> 3: Some examples given

<INPUT TYPE="radio" NAME="factual" VALUE="4"> 4

<INPUT TYPE="radio" NAME="factual" VALUE="5"> 5: All claims supported by examples</P>

<H4>Opinionation (not included in score)</H4>

<P><INPUT TYPE="radio" NAME="opinionation" VALUE="1"> 1: Strongly negative opinion expressed

<INPUT TYPE="radio" NAME="opinionation" VALUE="2"> 2

<INPUT TYPE="radio" NAME="opinionation" VALUE="3"> 3: Neutral

<INPUT TYPE="radio" NAME="opinionation" VALUE="4"> 4

<INPUT TYPE="radio" NAME="opinionation" VALUE="5"> 5: Strongly positive opinion expressed</P>

<H2>Questions answered:</H2>

<P><INPUT TYPE="checkbox" NAME="topics" VALUE="yes"> What topics did the professor cover? What did you learn in the class? </P>

<P><INPUT TYPE="checkbox" NAME="interest" VALUE="yes"> Did the professor seem to have a genuine interest in the topics he/she discussed? How did this affect the course? </P>

<P><INPUT TYPE="checkbox" NAME="environment" VALUE="yes"> Was the class intensive or lax? Did the environment the professor created seem formal or casual? </P>

<P><INPUT TYPE="checkbox" NAME="lectures" VALUE="yes"> How were lectures conducted? Did the professor lecture from notes or slides?

```

What did you think of the professor's instructional method? </P>

<P><INPUT TYPE="checkbox" NAME="examples" VALUE="yes"> Did you think
the professor used the proper amount of examples or demonstrations
during lectures? </P>

<P><INPUT TYPE="checkbox" NAME="homeworks" VALUE="yes"> What did you
think of the professors homeworks, tests, and projects? </P>

<P><INPUT TYPE="checkbox" NAME="room" VALUE="yes"> Was the class in a
large lecture hall or a small classroom? Did you feel the professor
worked well with the class size? </P>

<P><INPUT TYPE="checkbox" NAME="style" VALUE="yes"> What type of
student do you think would benefit most from this professor's style
of instruction? </P>

<P><INPUT TYPE="submit" NAME="Submit" VALUE="Submit"></P>
</FORM>

```

```
CFEND
```

```
}
```

```
sub HTMLBegin {
```

```
print "Content-type: text/html \n\n";
```

```
print<<HEADEREND;
```

```
<html>
```

```
<head><title>PRACS Data Entry</title></head>
```

```
<body>
```

```
HEADEREND
```

```
}
```

```
sub HTMLEnd {
```

```
print "</body>\n";
```

```
print "</html>\n";
```

```
}
```

```
sub DataMiner {
```

```
open(DATAFILE,"datafile.txt");
```

```
@lines=<DATAFILE>;
```

```
close(DATAFILE);
```

```
foreach(@lines) {
```

```
  @thisline=split(/\|/, $_);
```

```
  $sys=$thisline[0];
```

```
  $thissttotal=$sysdata{$sys}{total}{value};
```

```
  for($i=1; $i<7; $i++) {
```

```
    $sysdata{$sys}{$thissttotal}{value} += $thisline[$i];
```

```
  }
```

```
  for($i=8; $i<16; $i++) {
```

```
    if ($thisline[$i] eq "") {
```

```
    }
```

```
    else {
```

```
      $sysdata{$sys}{$thissttotal}{value} += 2;
```

```
    }
```

```
  }
```

```
  $sysdata{$sys}{maturity}{$thisline[1]}++;
```

```
  $sysdata{$sys}{relevance}{$thisline[2]}++;
```

```
  $sysdata{$sys}{spelling}{$thisline[3]}++;
```

```
  $sysdata{$sys}{attitude}{$thisline[4]}++;
```

```
  $sysdata{$sys}{specificity}{$thisline[5]}++;
```

```
  $sysdata{$sys}{factual}{$thisline[6]}++;
```

```
  $sysdata{$sys}{opinionation}{$thisline[7]}++;
```

```
  $sysdata{$sys}{topics}{value}++ if ($thisline[8]);
```

```
  $sysdata{$sys}{interest}{value}++ if ($thisline[9]);
```

```
  $sysdata{$sys}{environment}{value}++ if ($thisline[10]);
```

```
  $sysdata{$sys}{lectures}{value}++ if ($thisline[11]);
```

```
  $sysdata{$sys}{examples}{value}++ if ($thisline[12]);
```

```
  $sysdata{$sys}{homeworks}{value}++ if ($thisline[13]);
```



```

$sysdata{$sys}{room}{value}++ if ($thisline[14]);
$sysdata{$sys}{style}{value}++ if ($thisline[15]);

$sysdata{$sys}{thissystotal}{value} -= 6;
$sysdata{$sys}{total}{value}++;

if ($sys eq 'pracs') {
  $pracsopinion{$thisline[7]}{maturity} += $thisline[1];
  $pracsopinion{$thisline[7]}{maturitycounter}++;
  $pracsopinion{$thisline[7]}{relevance} += $thisline[2];
  $pracsopinion{$thisline[7]}{relevancecounter}++;
  $pracsopinion{$thisline[7]}{spelling} += $thisline[3];
  $pracsopinion{$thisline[7]}{spellingcounter}++;
  $pracsopinion{$thisline[7]}{attitude} += $thisline[4];
  $pracsopinion{$thisline[7]}{attitudecounter}++;
  $pracsopinion{$thisline[7]}{specificity} += $thisline[5];
  $pracsopinion{$thisline[7]}{specificitycounter}++;
  $pracsopinion{$thisline[7]}{factual} += $thisline[6];
  $pracsopinion{$thisline[7]}{factualcounter}++;
  $pracsopinion{$thisline[7]}{score} += $sysdata{$sys}{thissystotal}{value};
  $pracsopinion{$thisline[7]}{scorecounter}++;
}

if ($sys eq 'ratemyprofessors') {
  $rmpopinion{$thisline[7]}{maturity} += $thisline[1];
  $rmpopinion{$thisline[7]}{maturitycounter}++;
  $rmpopinion{$thisline[7]}{relevance} += $thisline[2];
  $rmpopinion{$thisline[7]}{relevancecounter}++;
  $rmpopinion{$thisline[7]}{spelling} += $thisline[3];
  $rmpopinion{$thisline[7]}{spellingcounter}++;
  $rmpopinion{$thisline[7]}{attitude} += $thisline[4];
  $rmpopinion{$thisline[7]}{attitudecounter}++;
  $rmpopinion{$thisline[7]}{specificity} += $thisline[5];
  $rmpopinion{$thisline[7]}{specificitycounter}++;
  $rmpopinion{$thisline[7]}{factual} += $thisline[6];
  $rmpopinion{$thisline[7]}{factualcounter}++;
  $rmpopinion{$thisline[7]}{score} += $sysdata{$sys}{thissystotal}{value};
  $rmpopinion{$thisline[7]}{scorecounter}++;
}

}

$rmptotal = $sysdata{ratemyprofessors}{total}{value};

for($i=0; $i<$sysdata{ratemyprofessors}{total}{value}; $i++) {
  $rmpmean+=$sysdata{ratemyprofessors}{$i}{value};
  if ($sysdata{ratemyprofessors}{$i}{value}>0 && $sysdata{ratemyprofessors}{$i}{value}<=4) {
    $sysdata{ratemyprofessors}{score}{04}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>4 && $sysdata{ratemyprofessors}{$i}{value}<=8) {
    $sysdata{ratemyprofessors}{score}{48}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>8 && $sysdata{ratemyprofessors}{$i}{value}<=12) {
    $sysdata{ratemyprofessors}{score}{812}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>12 && $sysdata{ratemyprofessors}{$i}{value}<=16) {
    $sysdata{ratemyprofessors}{score}{1216}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>16 && $sysdata{ratemyprofessors}{$i}{value}<=20) {
    $sysdata{ratemyprofessors}{score}{1620}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>20 && $sysdata{ratemyprofessors}{$i}{value}<=24) {
    $sysdata{ratemyprofessors}{score}{2024}++;
  }
  if ($sysdata{ratemyprofessors}{$i}{value}>24) {
    $sysdata{ratemyprofessors}{score}{24}++;
  }
}
$rmpmean=$rmpmean/$rmptotal;

for ($i=1; $i<6; $i++) {
  $rmpopinion{$i}{maturityavg} = $rmpopinion{$i}{maturity}/$rmpopinion{$i}{maturitycounter};
  $rmpopinion{$i}{relevanceavg} = $rmpopinion{$i}{relevance}/$rmpopinion{$i}{relevancecounter};
  $rmpopinion{$i}{spellingavg} = $rmpopinion{$i}{spelling}/$rmpopinion{$i}{spellingcounter};
  $rmpopinion{$i}{attitudeavg} = $rmpopinion{$i}{attitude}/$rmpopinion{$i}{attitudecounter};
  $rmpopinion{$i}{specificityavg} = $rmpopinion{$i}{specificity}/$rmpopinion{$i}{specificitycounter};
  $rmpopinion{$i}{factualavg} = $rmpopinion{$i}{factual}/$rmpopinion{$i}{factualcounter};
  $rmpopinion{$i}{scoreavg} = $rmpopinion{$i}{score}/$rmpopinion{$i}{scorecounter};
}

}

$ugctotal = $sysdata{underground}{total}{value};

for($i=0; $i<$sysdata{underground}{total}{value}; $i++) {

```

```

$ugcmean+=$sysdata{underground}{i}{value};
if ($sysdata{underground}{i}{value}>0 && $sysdata{underground}{i}{value}<=4) {
  $sysdata{underground}{score}{04}++;
}
if ($sysdata{underground}{i}{value}>4 && $sysdata{underground}{i}{value}<=8) {
  $sysdata{underground}{score}{48}++;
}
if ($sysdata{underground}{i}{value}>8 && $sysdata{underground}{i}{value}<=12) {
  $sysdata{underground}{score}{812}++;
}
if ($sysdata{underground}{i}{value}>12 && $sysdata{underground}{i}{value}<=16) {
  $sysdata{underground}{score}{1216}++;
}
if ($sysdata{underground}{i}{value}>16 && $sysdata{underground}{i}{value}<=20) {
  $sysdata{underground}{score}{1620}++;
}
if ($sysdata{underground}{i}{value}>20 && $sysdata{underground}{i}{value}<=24) {
  $sysdata{underground}{score}{2024}++;
}
if ($sysdata{underground}{i}{value}>24) {
  $sysdata{underground}{score}{24}++;
}
}
$ugcmean=$ugcmean/$ugcttotal;

$scrttotal = $sysdata{critical}{total}{value};

for($i=0; $i<$sysdata{critical}{total}{value}; $i++) {
  $crmean+=$sysdata{critical}{i}{value};
  if ($sysdata{critical}{i}{value}>0 && $sysdata{critical}{i}{value}<=4) {
    $sysdata{critical}{score}{04}++;
  }
  if ($sysdata{critical}{i}{value}>4 && $sysdata{critical}{i}{value}<=8) {
    $sysdata{critical}{score}{48}++;
  }
  if ($sysdata{critical}{i}{value}>8 && $sysdata{critical}{i}{value}<=12) {
    $sysdata{critical}{score}{812}++;
  }
  if ($sysdata{critical}{i}{value}>12 && $sysdata{critical}{i}{value}<=16) {
    $sysdata{critical}{score}{1216}++;
  }
  if ($sysdata{critical}{i}{value}>16 && $sysdata{critical}{i}{value}<=20) {
    $sysdata{critical}{score}{1620}++;
  }
  if ($sysdata{critical}{i}{value}>20 && $sysdata{critical}{i}{value}<=24) {
    $sysdata{critical}{score}{2024}++;
  }
  if ($sysdata{critical}{i}{value}>24) {
    $sysdata{critical}{score}{24}++;
  }
}
$crmean=$crmean/$scrttotal;

$pracsttotal = $sysdata{pracs}{total}{value};

for($i=0; $i<$sysdata{pracs}{total}{value}; $i++) {
  $pracsmean+=$sysdata{pracs}{i}{value};
  if ($sysdata{pracs}{i}{value}>0 && $sysdata{pracs}{i}{value}<=4) {
    $sysdata{pracs}{score}{04}++;
  }
  if ($sysdata{pracs}{i}{value}>4 && $sysdata{pracs}{i}{value}<=8) {
    $sysdata{pracs}{score}{48}++;
  }
  if ($sysdata{pracs}{i}{value}>8 && $sysdata{pracs}{i}{value}<=12) {
    $sysdata{pracs}{score}{812}++;
  }
  if ($sysdata{pracs}{i}{value}>12 && $sysdata{pracs}{i}{value}<=16) {
    $sysdata{pracs}{score}{1216}++;
  }
  if ($sysdata{pracs}{i}{value}>16 && $sysdata{pracs}{i}{value}<=20) {
    $sysdata{pracs}{score}{1620}++;
  }
  if ($sysdata{pracs}{i}{value}>20 && $sysdata{pracs}{i}{value}<=24) {
    $sysdata{pracs}{score}{2024}++;
  }
  if ($sysdata{pracs}{i}{value}>24) {
    $sysdata{pracs}{score}{24}++;
  }
}
$pracsmean=$pracsmean/$pracsttotal;

for ($i=1; $i<6; $i++) {
  $pracsopinion{i}{maturityavg} = $pracsopinion{i}{maturity}/$pracsopinion{i}{maturitycounter};
}

```

```

$pracsopinion{$i}{relevanceavg} = $pracsopinion{$i}{relevance}/$pracsopinion{$i}{relevancecounter};
$pracsopinion{$i}{spellingavg} = $pracsopinion{$i}{spelling}/$pracsopinion{$i}{spellingcounter};
$pracsopinion{$i}{attitudeavg} = $pracsopinion{$i}{attitude}/$pracsopinion{$i}{attitudecounter};
$pracsopinion{$i}{specificityavg} = $pracsopinion{$i}{specificity}/$pracsopinion{$i}{specificitycounter};
$pracsopinion{$i}{factualavg} = $pracsopinion{$i}{factual}/$pracsopinion{$i}{factualcounter};
$pracsopinion{$i}{scoreavg} = $pracsopinion{$i}{score}/$pracsopinion{$i}{scorecounter};
}

```

```

$aroundutotal = $sysdata{aroundu}{total}{value};

```

```

for($i=0; $i<$sysdata{aroundu}{total}{value}; $i++) {
  $aroundumean+=$sysdata{aroundu}{$i}{value};
  if ($sysdata{aroundu}{$i}{value}>0 && $sysdata{aroundu}{$i}{value}<=4) {
    $sysdata{aroundu}{score}{04}++;
  }
  if ($sysdata{aroundu}{$i}{value}>4 && $sysdata{aroundu}{$i}{value}<=8) {
    $sysdata{aroundu}{score}{48}++;
  }
  if ($sysdata{aroundu}{$i}{value}>8 && $sysdata{aroundu}{$i}{value}<=12) {
    $sysdata{aroundu}{score}{812}++;
  }
  if ($sysdata{aroundu}{$i}{value}>12 && $sysdata{aroundu}{$i}{value}<=16) {
    $sysdata{aroundu}{score}{1216}++;
  }
  if ($sysdata{aroundu}{$i}{value}>16 && $sysdata{aroundu}{$i}{value}<=20) {
    $sysdata{aroundu}{score}{1620}++;
  }
  if ($sysdata{aroundu}{$i}{value}>20 && $sysdata{aroundu}{$i}{value}<=24) {
    $sysdata{aroundu}{score}{2024}++;
  }
  if ($sysdata{aroundu}{$i}{value}>24) {
    $sysdata{aroundu}{score}{24}++;
  }
}

```

```

$aroundumean=$aroundumean/$aroundutotal;

```

```

print<<DMPAGE;

```

```

<H3>Rate my professors:</H3>

```

```

$rmptotal comments total<P>

```

```

Average score:$rmpmean out of 40 (24 considered a "perfect" score)<P>

```

```

Score Distribution:<P>

```

```

0-4: $sysdata{ratemyprofessors}{score}{04}<BR>
4-8: $sysdata{ratemyprofessors}{score}{48}<BR>
8-12: $sysdata{ratemyprofessors}{score}{812}<BR>
12-16: $sysdata{ratemyprofessors}{score}{1216}<BR>
16-20: $sysdata{ratemyprofessors}{score}{1620}<BR>
20-24: $sysdata{ratemyprofessors}{score}{2024}<BR>
24+: $sysdata{ratemyprofessors}{score}{24}<P>

```

```

Data mining:<P>

```

```

Maturity Average:<BR>

```

```

Opinionation of 1: $rmpopinion{1}{maturityavg}<BR>
Opinionation of 2: $rmpopinion{2}{maturityavg}<BR>
Opinionation of 3: $rmpopinion{3}{maturityavg}<BR>
Opinionation of 4: $rmpopinion{4}{maturityavg}<BR>
Opinionation of 5: $rmpopinion{5}{maturityavg}<P>

```

```

Relevance Average:<BR>

```

```

Opinionation of 1: $rmpopinion{1}{relevanceavg}<BR>
Opinionation of 2: $rmpopinion{2}{relevanceavg}<BR>
Opinionation of 3: $rmpopinion{3}{relevanceavg}<BR>
Opinionation of 4: $rmpopinion{4}{relevanceavg}<BR>
Opinionation of 5: $rmpopinion{5}{relevanceavg}<P>

```

```

Spelling/grammar Average:<BR>

```

```

Opinionation of 1: $rmpopinion{1}{spellingavg}<BR>
Opinionation of 2: $rmpopinion{2}{spellingavg}<BR>
Opinionation of 3: $rmpopinion{3}{spellingavg}<BR>
Opinionation of 4: $rmpopinion{4}{spellingavg}<BR>
Opinionation of 5: $rmpopinion{5}{spellingavg}<P>

```

```

Attitude Average:<BR>

```

```

Opinionation of 1: $rmpopinion{1}{attitudeavg}<BR>
Opinionation of 2: $rmpopinion{2}{attitudeavg}<BR>
Opinionation of 3: $rmpopinion{3}{attitudeavg}<BR>
Opinionation of 4: $rmpopinion{4}{attitudeavg}<BR>
Opinionation of 5: $rmpopinion{5}{attitudeavg}<P>

```

```

Specificity Average:<BR>

```

```

Opinionation of 1: $rmpopinion{1}{specificityavg}<BR>

```

Opinionation of 2: \$rmpopinion{2}{specificityavg}

Opinionation of 3: \$rmpopinion{3}{specificityavg}

Opinionation of 4: \$rmpopinion{4}{specificityavg}

Opinionation of 5: \$rmpopinion{5}{specificityavg}<P>

Factual Average:

Opinionation of 1: \$rmpopinion{1}{factualavg}

Opinionation of 2: \$rmpopinion{2}{factualavg}

Opinionation of 3: \$rmpopinion{3}{factualavg}

Opinionation of 4: \$rmpopinion{4}{factualavg}

Opinionation of 5: \$rmpopinion{5}{factualavg}<P>

Overall Score Average:

Opinionation of 1: \$rmpopinion{1}{scoreavg}

Opinionation of 2: \$rmpopinion{2}{scoreavg}

Opinionation of 3: \$rmpopinion{3}{scoreavg}

Opinionation of 4: \$rmpopinion{4}{scoreavg}

Opinionation of 5: \$rmpopinion{5}{scoreavg}<P>

Number with maturity of 1: \$sysdata{ratemyprofessors}{maturity}{1}

Number with maturity of 2: \$sysdata{ratemyprofessors}{maturity}{2}

Number with maturity of 3: \$sysdata{ratemyprofessors}{maturity}{3}

Number with maturity of 4: \$sysdata{ratemyprofessors}{maturity}{4}

Number with maturity of 5: \$sysdata{ratemyprofessors}{maturity}{5}

<P>

Number with relevance of 1: \$sysdata{ratemyprofessors}{relevance}{1}

Number with relevance of 2: \$sysdata{ratemyprofessors}{relevance}{2}

Number with relevance of 3: \$sysdata{ratemyprofessors}{relevance}{3}

Number with relevance of 4: \$sysdata{ratemyprofessors}{relevance}{4}

Number with relevance of 5: \$sysdata{ratemyprofessors}{relevance}{5}

<P>

Number with spelling of 1: \$sysdata{ratemyprofessors}{spelling}{1}

Number with spelling of 2: \$sysdata{ratemyprofessors}{spelling}{2}

Number with spelling of 3: \$sysdata{ratemyprofessors}{spelling}{3}

Number with spelling of 4: \$sysdata{ratemyprofessors}{spelling}{4}

Number with spelling of 5: \$sysdata{ratemyprofessors}{spelling}{5}

<P>

Number with attitude of 1: \$sysdata{ratemyprofessors}{attitude}{1}

Number with attitude of 2: \$sysdata{ratemyprofessors}{attitude}{2}

Number with attitude of 3: \$sysdata{ratemyprofessors}{attitude}{3}

Number with attitude of 4: \$sysdata{ratemyprofessors}{attitude}{4}

Number with attitude of 5: \$sysdata{ratemyprofessors}{attitude}{5}

<P>

Number with specificity of 1: \$sysdata{ratemyprofessors}{specificity}{1}

Number with specificity of 2: \$sysdata{ratemyprofessors}{specificity}{2}

Number with specificity of 3: \$sysdata{ratemyprofessors}{specificity}{3}

Number with specificity of 4: \$sysdata{ratemyprofessors}{specificity}{4}

Number with specificity of 5: \$sysdata{ratemyprofessors}{specificity}{5}

<P>

Number with factual of 1: \$sysdata{ratemyprofessors}{factual}{1}

Number with factual of 2: \$sysdata{ratemyprofessors}{factual}{2}

Number with factual of 3: \$sysdata{ratemyprofessors}{factual}{3}

Number with factual of 4: \$sysdata{ratemyprofessors}{factual}{4}

Number with factual of 5: \$sysdata{ratemyprofessors}{factual}{5}

<P>

Number with opinionation of 1: \$sysdata{ratemyprofessors}{opinionation}{1}

Number with opinionation of 2: \$sysdata{ratemyprofessors}{opinionation}{2}

Number with opinionation of 3: \$sysdata{ratemyprofessors}{opinionation}{3}

Number with opinionation of 4: \$sysdata{ratemyprofessors}{opinionation}{4}

Number with opinionation of 5: \$sysdata{ratemyprofessors}{opinionation}{5}

<P>

Number with topics question answered: \$sysdata{ratemyprofessors}{topics}{value}

Number with interest question answered: \$sysdata{ratemyprofessors}{interest}{value}

Number with environment question answered: \$sysdata{ratemyprofessors}{environment}{value}

Number with lectures question answered: \$sysdata{ratemyprofessors}{lectures}{value}

Number with examples question answered: \$sysdata{ratemyprofessors}{examples}{value}

Number with homeworks question answered: \$sysdata{ratemyprofessors}{homeworks}{value}

Number with room question answered: \$sysdata{ratemyprofessors}{room}{value}

Number with style question answered: \$sysdata{ratemyprofessors}{style}{value}

<H3>Underground Guide to Course VI:</H3>

\$ugctotal comments total<P>

Average score:\$ugcmean out of 40 (24 considered a "perfect" score)<P>

Score Distribution:<P>

0-4: \$sysdata{underground}{score}{04}

4-8: \$sysdata{underground}{score}{48}

8-12: \$sysdata{underground}{score}{812}

12-16: \$sysdata{underground}{score}{1216}

16-20: \$sysdata{underground}{score}{1620}

20-24: \$sysdata{underground}{score}{2024}

24+: \$sysdata{underground}{score}{24}<P>

Number with maturity of 1: \$sysdata{underground}{maturity}{1}

Number with maturity of 2: \$sysdata{underground}{maturity}{2}

Number with maturity of 3: \$sysdata{underground}{maturity}{3}

Number with maturity of 4: \$sysdata{underground}{maturity}{4}

Number with maturity of 5: \$sysdata{underground}{maturity}{5}

<P>
Number with relevance of 1: \$sysdata{underground}{relevance}{1}

Number with relevance of 2: \$sysdata{underground}{relevance}{2}

Number with relevance of 3: \$sysdata{underground}{relevance}{3}

Number with relevance of 4: \$sysdata{underground}{relevance}{4}

Number with relevance of 5: \$sysdata{underground}{relevance}{5}

<P>
Number with spelling of 1: \$sysdata{underground}{spelling}{1}

Number with spelling of 2: \$sysdata{underground}{spelling}{2}

Number with spelling of 3: \$sysdata{underground}{spelling}{3}

Number with spelling of 4: \$sysdata{underground}{spelling}{4}

Number with spelling of 5: \$sysdata{underground}{spelling}{5}

<P>
Number with attitude of 1: \$sysdata{underground}{attitude}{1}

Number with attitude of 2: \$sysdata{underground}{attitude}{2}

Number with attitude of 3: \$sysdata{underground}{attitude}{3}

Number with attitude of 4: \$sysdata{underground}{attitude}{4}

Number with attitude of 5: \$sysdata{underground}{attitude}{5}

<P>
Number with specificity of 1: \$sysdata{underground}{specificity}{1}

Number with specificity of 2: \$sysdata{underground}{specificity}{2}

Number with specificity of 3: \$sysdata{underground}{specificity}{3}

Number with specificity of 4: \$sysdata{underground}{specificity}{4}

Number with specificity of 5: \$sysdata{underground}{specificity}{5}

<P>
Number with factual of 1: \$sysdata{underground}{factual}{1}

Number with factual of 2: \$sysdata{underground}{factual}{2}

Number with factual of 3: \$sysdata{underground}{factual}{3}

Number with factual of 4: \$sysdata{underground}{factual}{4}

Number with factual of 5: \$sysdata{underground}{factual}{5}

<P>
Number with opinionation of 1: \$sysdata{underground}{opinionation}{1}

Number with opinionation of 2: \$sysdata{underground}{opinionation}{2}

Number with opinionation of 3: \$sysdata{underground}{opinionation}{3}

Number with opinionation of 4: \$sysdata{underground}{opinionation}{4}

Number with opinionation of 5: \$sysdata{underground}{opinionation}{5}

<P>
Number with topics question answered: \$sysdata{underground}{topics}{value}

Number with interest question answered: \$sysdata{underground}{interest}{value}

Number with environment question answered: \$sysdata{underground}{environment}{value}

Number with lectures question answered: \$sysdata{underground}{lectures}{value}

Number with examples question answered: \$sysdata{underground}{examples}{value}

Number with homeworks question answered: \$sysdata{underground}{homeworks}{value}

Number with room question answered: \$sysdata{underground}{room}{value}

Number with style question answered: \$sysdata{underground}{style}{value}

<H3>Critical Review:</H3>

\$crtotal comments total<P>

Average score:\$crmean out of 40 (24 considered a "perfect" score)<P>

Score Distribution:<P>

0-4: \$sysdata{critical}{score}{04}

4-8: \$sysdata{critical}{score}{48}

8-12: \$sysdata{critical}{score}{812}

12-16: \$sysdata{critical}{score}{1216}

16-20: \$sysdata{critical}{score}{1620}

20-24: \$sysdata{critical}{score}{2024}

24+: \$sysdata{critical}{score}{24}<P>

Number with maturity of 1: \$sysdata{critical}{maturity}{1}

Number with maturity of 2: \$sysdata{critical}{maturity}{2}

Number with maturity of 3: \$sysdata{critical}{maturity}{3}

Number with maturity of 4: \$sysdata{critical}{maturity}{4}

Number with maturity of 5: \$sysdata{critical}{maturity}{5}

<P>
Number with relevance of 1: \$sysdata{critical}{relevance}{1}

Number with relevance of 2: \$sysdata{critical}{relevance}{2}

Number with relevance of 3: \$sysdata{critical}{relevance}{3}

Number with relevance of 4: \$sysdata{critical}{relevance}{4}

Number with relevance of 5: \$sysdata{critical}{relevance}{5}

<P>
Number with spelling of 1: \$sysdata{critical}{spelling}{1}

Number with spelling of 2: \$sysdata{critical}{spelling}{2}

Number with spelling of 3: \$sysdata{critical}{spelling}{3}

Number with spelling of 4: \$sysdata{critical}{spelling}{4}

Number with spelling of 5: \$sysdata{critical}{spelling}{5}

<P>
Number with attitude of 1: \$sysdata{critical}{attitude}{1}

Number with attitude of 2: \$sysdata{critical}{attitude}{2}

Number with attitude of 3: \$sysdata{critical}{attitude}{3}

Number with attitude of 4: \$sysdata{critical}{attitude}{4}

Number with attitude of 5: \$sysdata{critical}{attitude}{5}

<P>
Number with specificity of 1: \$sysdata{critical}{specificity}{1}

Number with specificity of 2: \$sysdata{critical}{specificity}{2}

Number with specificity of 3: \$sysdata{critical}{specificity}{3}

Number with specificity of 4: \$sysdata{critical}{specificity}{4}

Number with specificity of 5: \$sysdata{critical}{specificity}{5}

<P>
Number with factual of 1: \$sysdata{critical}{factual}{1}

Number with factual of 2: \$sysdata{critical}{factual}{2}

Number with factual of 3: \$sysdata{critical}{factual}{3}

Number with factual of 4: \$sysdata{critical}{factual}{4}

Number with factual of 5: \$sysdata{critical}{factual}{5}

<P>
Number with opinionation of 1: \$sysdata{critical}{opinionation}{1}

Number with opinionation of 2: \$sysdata{critical}{opinionation}{2}

Number with opinionation of 3: \$sysdata{critical}{opinionation}{3}

Number with opinionation of 4: \$sysdata{critical}{opinionation}{4}

Number with opinionation of 5: \$sysdata{critical}{opinionation}{5}

<P>
Number with topics question answered: \$sysdata{critical}{topics}{value}

Number with interest question answered: \$sysdata{critical}{interest}{value}

Number with environment question answered: \$sysdata{critical}{environment}{value}

Number with lectures question answered: \$sysdata{critical}{lectures}{value}

Number with examples question answered: \$sysdata{critical}{examples}{value}

Number with homeworks question answered: \$sysdata{critical}{homeworks}{value}

Number with room question answered: \$sysdata{critical}{room}{value}

Number with style question answered: \$sysdata{critical}{style}{value}

<H3>PRACS:</H3>

\$pracstotal comments total<P>

Average score:\$pracsmean out of 40 (24 considered a "perfect" score)<P>

Score Distribution:<P>

0-4: \$sysdata{pracs}{score}{04}

4-8: \$sysdata{pracs}{score}{48}

8-12: \$sysdata{pracs}{score}{812}

12-16: \$sysdata{pracs}{score}{1216}

16-20: \$sysdata{pracs}{score}{1620}

20-24: \$sysdata{pracs}{score}{2024}

24+: \$sysdata{pracs}{score}{24}<P>

Data mining:<P>

Maturity Average:

Opinionation of 1: \$pracsopinion{1}{maturityavg}

Opinionation of 2: \$pracsopinion{2}{maturityavg}

Opinionation of 3: \$pracsopinion{3}{maturityavg}

Opinionation of 4: \$pracsopinion{4}{maturityavg}

Opinionation of 5: \$pracsopinion{5}{maturityavg}<P>

Relevance Average:

Opinionation of 1: \$pracsopinion{1}{relevanceavg}

Opinionation of 2: \$pracsopinion{2}{relevanceavg}

Opinionation of 3: \$pracsopinion{3}{relevanceavg}

Opinionation of 4: \$pracsopinion{4}{relevanceavg}

Opinionation of 5: \$pracsopinion{5}{relevanceavg}<P>

Spelling/grammar Average:

Opinionation of 1: \$pracsopinion{1}{spellingavg}

Opinionation of 2: \$pracsopinion{2}{spellingavg}

Opinionation of 3: \$pracsopinion{3}{spellingavg}

Opinionation of 4: \$pracsopinion{4}{spellingavg}

Opinionation of 5: \$pracsopinion{5}{spellingavg}<P>

Attitude Average:

Opinionation of 1: \$pracsopinion{1}{attitudeavg}

Opinionation of 2: \$pracsopinion{2}{attitudeavg}

Opinionation of 3: \$pracsopinion{3}{attitudeavg}

Opinionation of 4: \$pracsopinion{4}{attitudeavg}

Opinionation of 5: \$pracsopinion{5}{attitudeavg}<P>

Specificity Average:

Opinionation of 1: \$pracsopinion{1}{specificityavg}

Opinionation of 2: \$pracsopinion{2}{specificityavg}

Opinionation of 3: \$pracsopinion{3}{specificityavg}

Opinionation of 4: \$pracsopinion{4}{specificityavg}

Opinionation of 5: \$pracsopinion{5}{specificityavg}<P>

Factual Average:

Opinionation of 1: \$pracsopinion{1}{factualavg}

Opinionation of 2: \$pracsopinion{2}{factualavg}

Opinionation of 3: \$pracsopinion{3}{factualavg}

Opinionation of 4: \$pracsopinion{4}{factualavg}

Opinionation of 5: \$pracsopinion{5}{factualavg}<P>

Overall Score Average:

Opinionation of 1: \$pracsopinion{1}{scoreavg}

Opinionation of 2: \$pracsopinion{2}{scoreavg}

Opinionation of 3: \$pracsopinion{3}{scoreavg}

Opinionation of 4: \$pracsopinion{4}{scoreavg}

Opinionation of 5: \$pracsopinion{5}{scoreavg}<P>

Number with maturity of 1: \$sysdata{pracs}{maturity}{1}

Number with maturity of 2: \$sysdata{pracs}{maturity}{2}

Number with maturity of 3: \$sysdata{pracs}{maturity}{3}

Number with maturity of 4: \$sysdata{pracs}{maturity}{4}

Number with maturity of 5: \$sysdata{pracs}{maturity}{5}

<P>

Number with relevance of 1: \$sysdata{pracs}{relevance}{1}

Number with relevance of 2: \$sysdata{pracs}{relevance}{2}

Number with relevance of 3: \$sysdata{pracs}{relevance}{3}

Number with relevance of 4: \$sysdata{pracs}{relevance}{4}

Number with relevance of 5: \$sysdata{pracs}{relevance}{5}

<P>

Number with spelling of 1: \$sysdata{pracs}{spelling}{1}

Number with spelling of 2: \$sysdata{pracs}{spelling}{2}

Number with spelling of 3: \$sysdata{pracs}{spelling}{3}

Number with spelling of 4: \$sysdata{pracs}{spelling}{4}

Number with spelling of 5: \$sysdata{pracs}{spelling}{5}

<P>

Number with attitude of 1: \$sysdata{pracs}{attitude}{1}

Number with attitude of 2: \$sysdata{pracs}{attitude}{2}

Number with attitude of 3: \$sysdata{pracs}{attitude}{3}

Number with attitude of 4: \$sysdata{pracs}{attitude}{4}

Number with attitude of 5: \$sysdata{pracs}{attitude}{5}

<P>

Number with specificity of 1: \$sysdata{pracs}{specificity}{1}

Number with specificity of 2: \$sysdata{pracs}{specificity}{2}

Number with specificity of 3: \$sysdata{pracs}{specificity}{3}

Number with specificity of 4: \$sysdata{pracs}{specificity}{4}

Number with specificity of 5: \$sysdata{pracs}{specificity}{5}

<P>

Number with factual of 1: \$sysdata{pracs}{factual}{1}

Number with factual of 2: \$sysdata{pracs}{factual}{2}

Number with factual of 3: \$sysdata{pracs}{factual}{3}

Number with factual of 4: \$sysdata{pracs}{factual}{4}

Number with factual of 5: \$sysdata{pracs}{factual}{5}

<P>

Number with opinionation of 1: \$sysdata{pracs}{opinionation}{1}

Number with opinionation of 2: \$sysdata{pracs}{opinionation}{2}

Number with opinionation of 3: \$sysdata{pracs}{opinionation}{3}

Number with opinionation of 4: \$sysdata{pracs}{opinionation}{4}

Number with opinionation of 5: \$sysdata{pracs}{opinionation}{5}

<P>

Number with topics question answered: \$sysdata{pracs}{topics}{value}

Number with interest question answered: \$sysdata{pracs}{interest}{value}

Number with environment question answered: \$sysdata{pracs}{environment}{value}

Number with lectures question answered: \$sysdata{pracs}{lectures}{value}

Number with examples question answered: \$sysdata{pracs}{examples}{value}

Number with homeworks question answered: \$sysdata{pracs}{homeworks}{value}

Number with room question answered: \$sysdata{pracs}{room}{value}

Number with style question answered: \$sysdata{pracs}{style}{value}

<H3>AroundU:</H3>

\$arountototal comments total<P>

Average score:\$aroundumean out of 40 (24 considered a "perfect" score)<P>

Score Distribution:<P>

0-4: \$sysdata{aroundu}{score}{04}

4-8: \$sysdata{aroundu}{score}{48}

8-12: \$sysdata{aroundu}{score}{812}

12-16: \$sysdata{aroundu}{score}{1216}

16-20: \$sysdata{aroundu}{score}{1620}

20-24: \$sysdata{aroundu}{score}{2024}

24+: \$sysdata{aroundu}{score}{24}<P>

Number with maturity of 1: \$sysdata{aroundu}{maturity}{1}

Number with maturity of 2: \$sysdata{aroundu}{maturity}{2}

Number with maturity of 3: \$sysdata{aroundu}{maturity}{3}

Number with maturity of 4: \$sysdata{aroundu}{maturity}{4}

Number with maturity of 5: \$sysdata{aroundu}{maturity}{5}

<P>

```

Number with relevance of 1: $sysdata{aroundu}{relevance}{1}<BR>
Number with relevance of 2: $sysdata{aroundu}{relevance}{2}<BR>
Number with relevance of 3: $sysdata{aroundu}{relevance}{3}<BR>
Number with relevance of 4: $sysdata{aroundu}{relevance}{4}<BR>
Number with relevance of 5: $sysdata{aroundu}{relevance}{5}<BR>
<P>
Number with spelling of 1: $sysdata{aroundu}{spelling}{1}<BR>
Number with spelling of 2: $sysdata{aroundu}{spelling}{2}<BR>
Number with spelling of 3: $sysdata{aroundu}{spelling}{3}<BR>
Number with spelling of 4: $sysdata{aroundu}{spelling}{4}<BR>
Number with spelling of 5: $sysdata{aroundu}{spelling}{5}<BR>
<P>
Number with attitude of 1: $sysdata{aroundu}{attitude}{1}<BR>
Number with attitude of 2: $sysdata{aroundu}{attitude}{2}<BR>
Number with attitude of 3: $sysdata{aroundu}{attitude}{3}<BR>
Number with attitude of 4: $sysdata{aroundu}{attitude}{4}<BR>
Number with attitude of 5: $sysdata{aroundu}{attitude}{5}<BR>
<P>
Number with specificity of 1: $sysdata{aroundu}{specificity}{1}<BR>
Number with specificity of 2: $sysdata{aroundu}{specificity}{2}<BR>
Number with specificity of 3: $sysdata{aroundu}{specificity}{3}<BR>
Number with specificity of 4: $sysdata{aroundu}{specificity}{4}<BR>
Number with specificity of 5: $sysdata{aroundu}{specificity}{5}<BR>
<P>
Number with factual of 1: $sysdata{aroundu}{factual}{1}<BR>
Number with factual of 2: $sysdata{aroundu}{factual}{2}<BR>
Number with factual of 3: $sysdata{aroundu}{factual}{3}<BR>
Number with factual of 4: $sysdata{aroundu}{factual}{4}<BR>
Number with factual of 5: $sysdata{aroundu}{factual}{5}<BR>
<P>
Number with opinionation of 1: $sysdata{aroundu}{opinionation}{1}<BR>
Number with opinionation of 2: $sysdata{aroundu}{opinionation}{2}<BR>
Number with opinionation of 3: $sysdata{aroundu}{opinionation}{3}<BR>
Number with opinionation of 4: $sysdata{aroundu}{opinionation}{4}<BR>
Number with opinionation of 5: $sysdata{aroundu}{opinionation}{5}<BR>
<P>
Number with topics question answered: $sysdata{aroundu}{topics}{value}<BR>
Number with interest question answered: $sysdata{aroundu}{interest}{value}<BR>
Number with environment question answered: $sysdata{aroundu}{environment}{value}<BR>
Number with lectures question answered: $sysdata{aroundu}{lectures}{value}<BR>
Number with examples question answered: $sysdata{aroundu}{examples}{value}<BR>
Number with homeworks question answered: $sysdata{aroundu}{homeworks}{value}<BR>
Number with room question answered: $sysdata{aroundu}{room}{value}<BR>
Number with style question answered: $sysdata{aroundu}{style}{value}<BR>
DMPAGE
}

```

C.3 Comment Database

The database is in MySQL format and contains four tables. They have the following fields:

access: id (16-bit integer, auto-increment), ip (32 characters, variable length), accesses (16-bit integer, default of 0)

comments: id (11-bit integer, auto increment), number (6 characters, variable length), prof (3 characters), student (16 characters, variable length), ipaddy (15 characters, variable length), timestamp (datetime), hidden (boolean), comments (text)

professors: id (11-bit integer, auto increment), displayname (64 characters, variable), initials (3 characters), dept (2 characters)

users: id (11-bit integer), username (20 characters, variable), password (20 characters, variable), major (40 characters, variable), year (8 characters, variable), hear (50 characters, variable), signup (datetime)

Appendix D: Publicity Material

The following text was used in a flyer posted around the WPI campus, and in a post to the newsgroup wpi.students, to publicize the PRACS system:

Comment on Your Professors!

<http://www.acm.wpi.edu/~pracs/>

With the introduction of the Professor Rating And Comments System (PRACS), you can offer your praise and gripes about professors to other students so that they can better select professors that fit their own style. Also, feel free to read any of the comments from other students already in the database.

All comments posted are completely anonymous!

This system is part of an IQP by Colin Bourassa (colinb@wpi.edu) and Frank Gerrata (frankg@wpi.edu). Please contact them with any questions.