

Detailed Design

Requested by: Mr. James Matthews
Professor
Siena College
Computer Science Department

Dr. Scott Vandenberg
Head of Department
Siena College
Computer Science Department

Programming Contest Submission and Scoreboard

SEG

Prepared by:

Thomas Hyne, Team Leader
Paul Califano
Adam Pasquerella
George Reese
Mark St. Hilare
Melissa Hoffmann

Presentation:

March 1, 2005

6:00-9:00pm – Roger Bacon 328

Programming Contest Submission and Scoreboard Detailed Design

Table of Contents

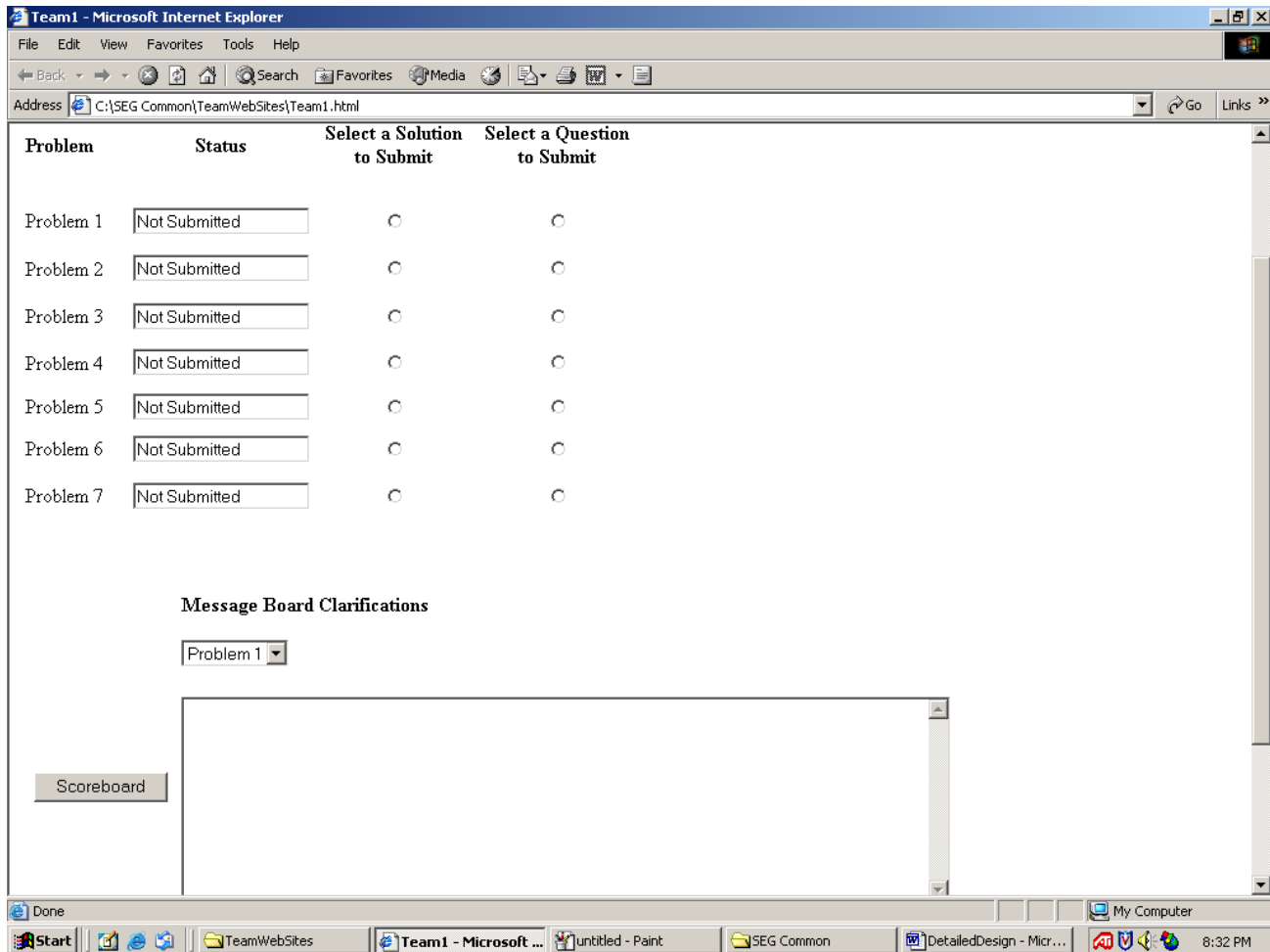
Section 1:	<u>External Design Specifications</u>	
Section 1.1:	User Displays and Reports Formats.....	2
Section 1.2:	User Command Summary.....	25
Section 1.3:	Detailed Data Flow Diagrams.....	27
Section 1.4:	Logical Data Stores.....	52
Section 2:	<u>Testing Requirements</u>	
Section 2.1	Team GUI Testing.....	57
Section 2.1	Judges GUI Testing.....	58
Section 2.1	Scoreboard Testing.....	59
Section 2.1	Programming Contest Website Testing.....	59
Section 3:	Sources of Information.....	60
Section 4:	Glossary of Terms.....	61
Section 5:	Gantt Charts.....	62

Section 1: External Design Specifications

Section 1.1: User Displays and Reports Format

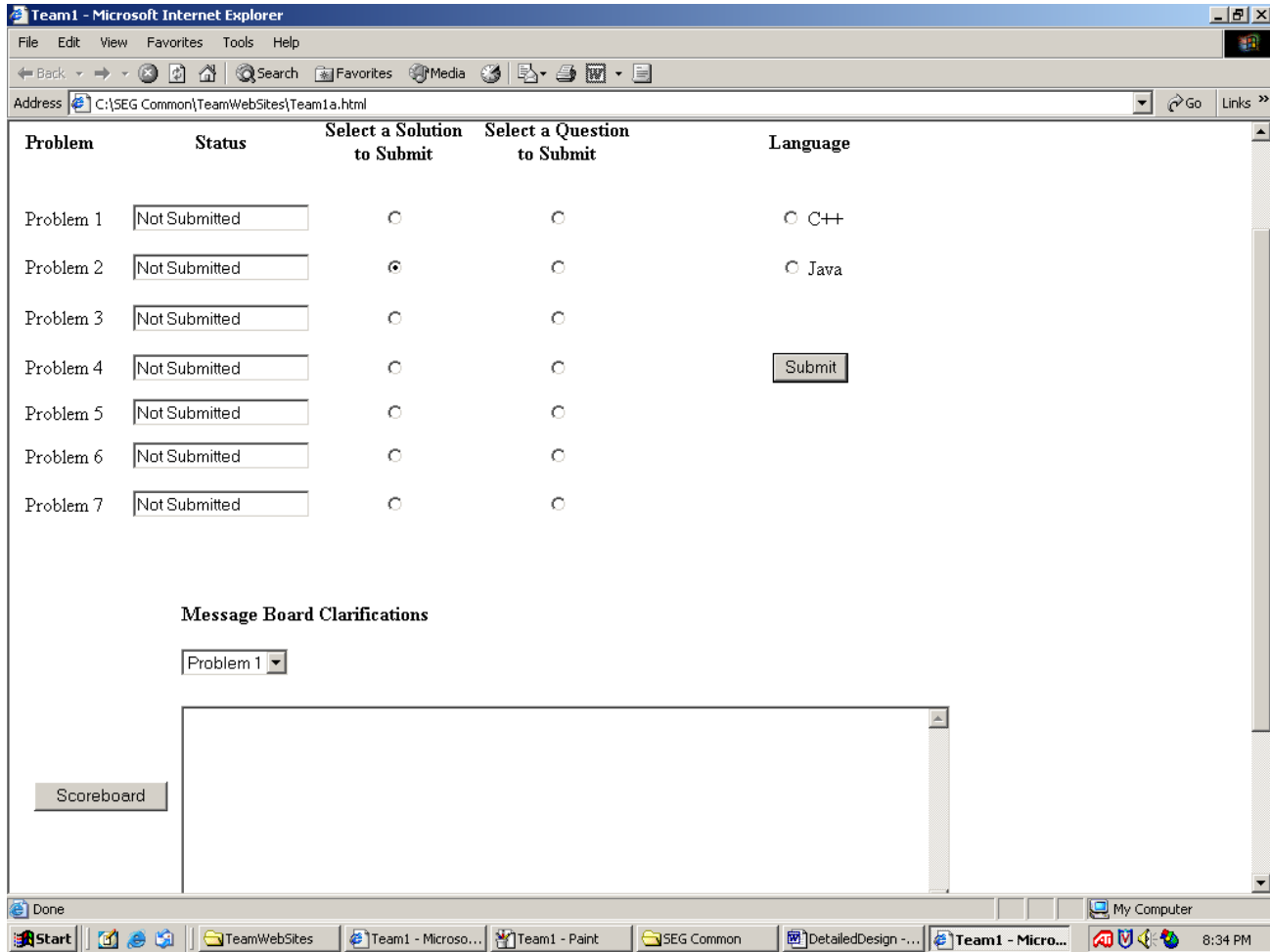
Team Web Sites

Team 1



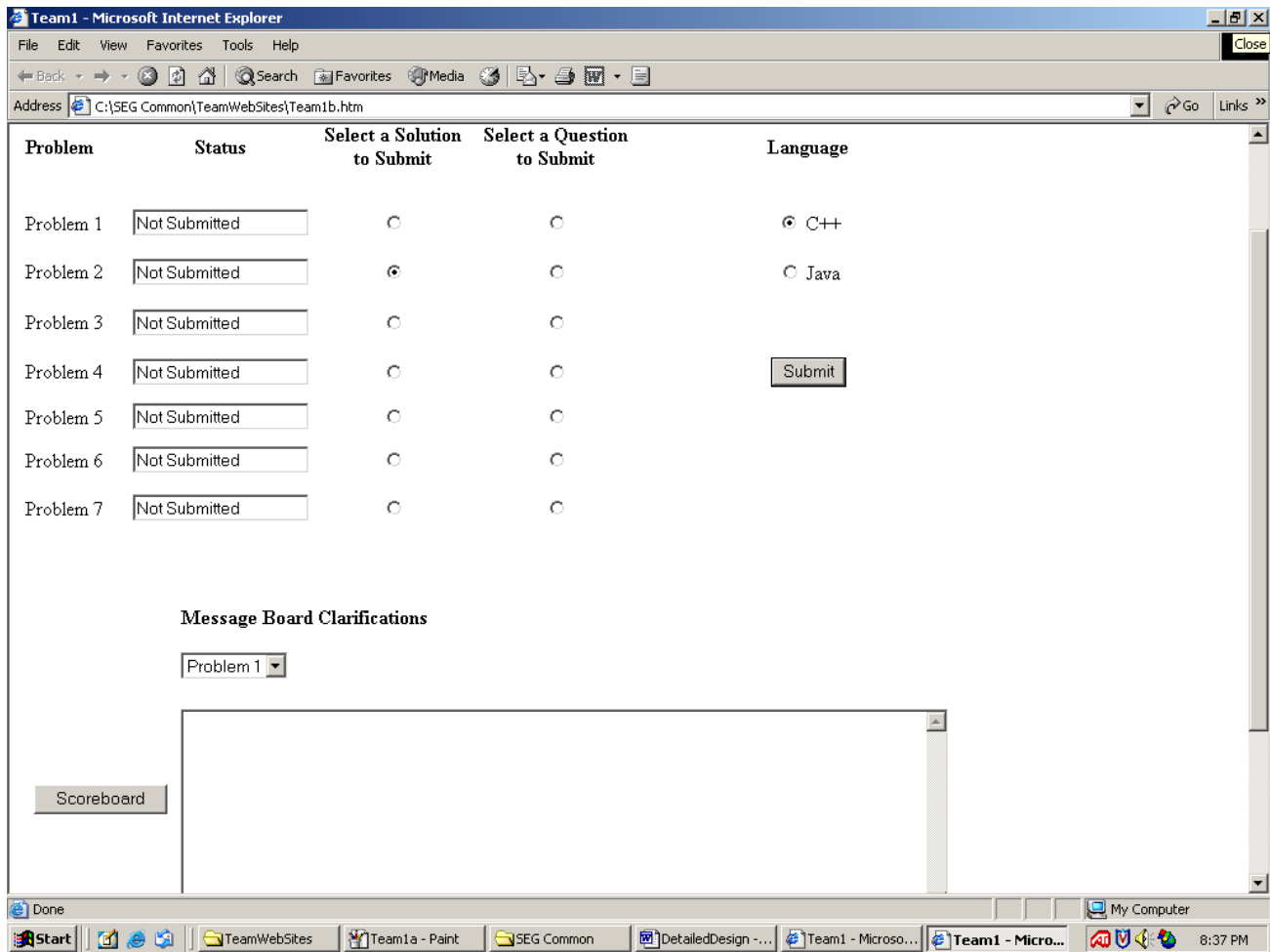
This is the page that the teams see when they first start running the software. It shows all of the problems that the teams have to complete and their status, either not submitted, submitted, being judged, correct or incorrect. The radio buttons are used to submit a solution or question to a specific problem. The page also contains a message board where all the team's questions are listed for all the teams to view. The scoreboard button is a link to the programming contest scoreboard that shows the status of the contest.

Team 1A



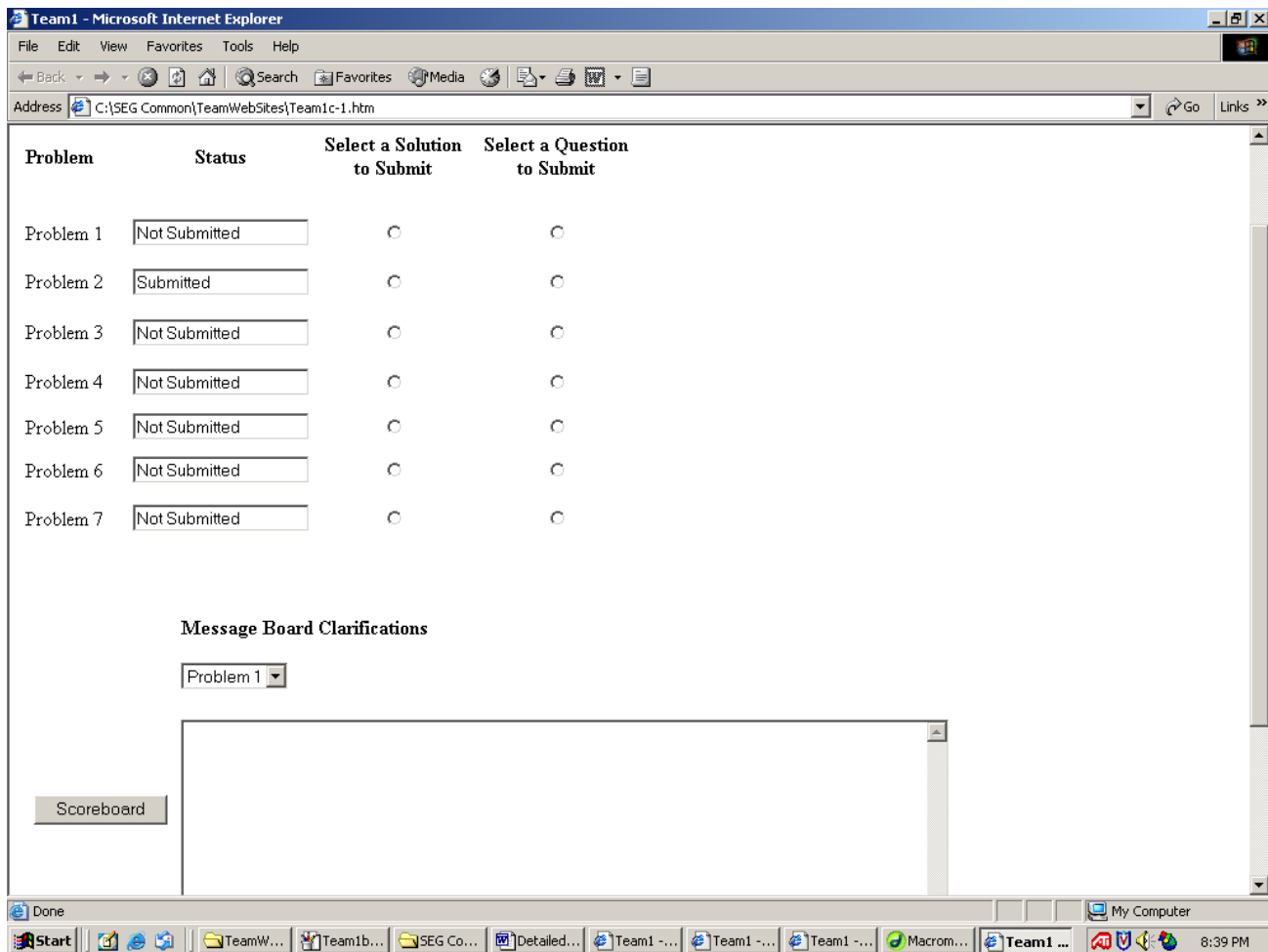
When a team completes an answer to a problem, they select the radio button for that problem in the “select a solution to submit” column. When this radio button is selected, two more radio buttons come up for the team to select the language that they used to code.

Team 1B



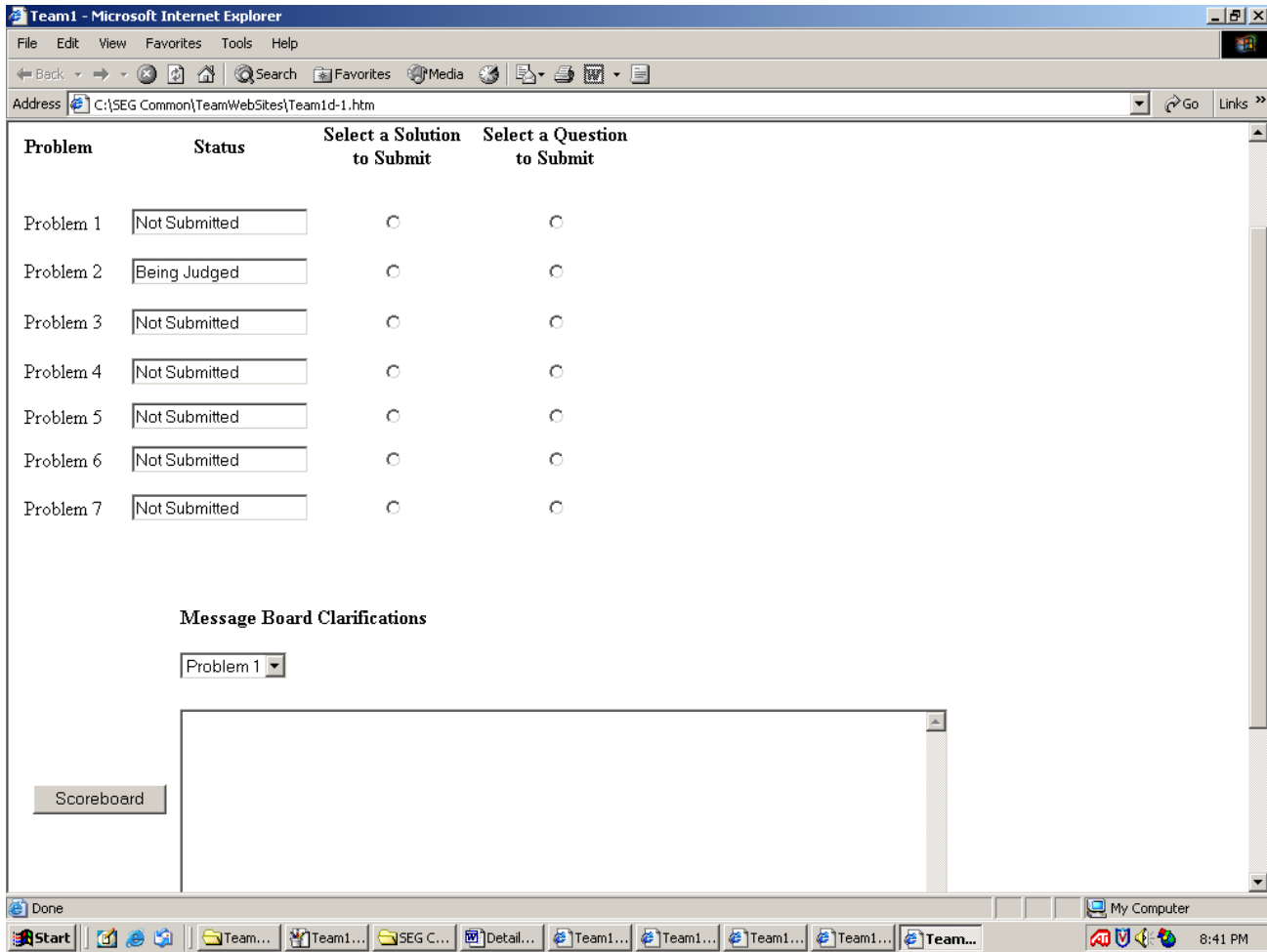
The team then selects the radio button for the language they used. The team then presses the submit button and the file that contains their answer is submitted to the judges for that specific problem.

Team 1C



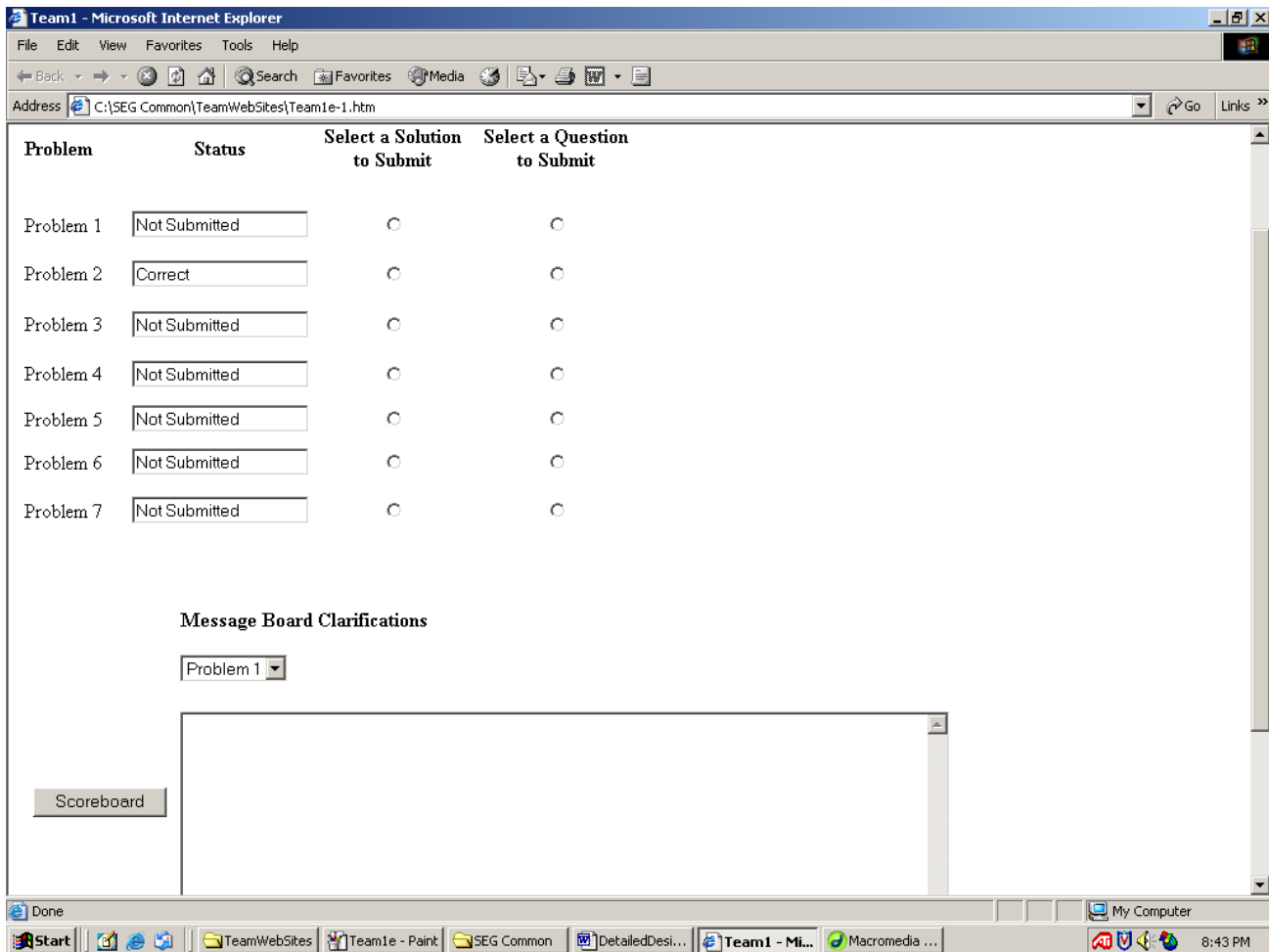
Once a file is submitted for a specific problem, the status of that problem changes from not submitted to submitted.

Team 1D



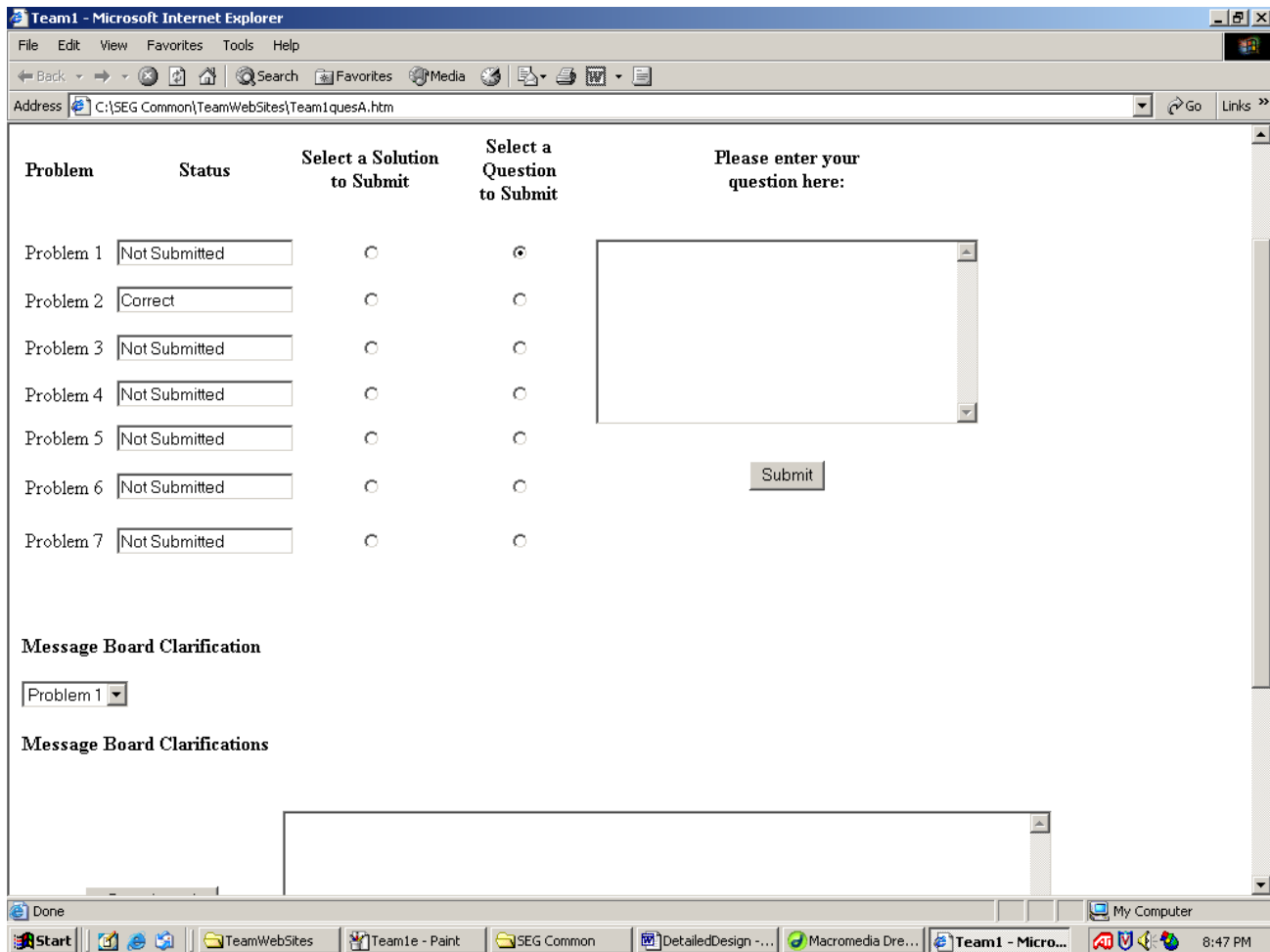
The status of the file for the problem changes to being judged when a judge selects the file to be graded.

Team 1E



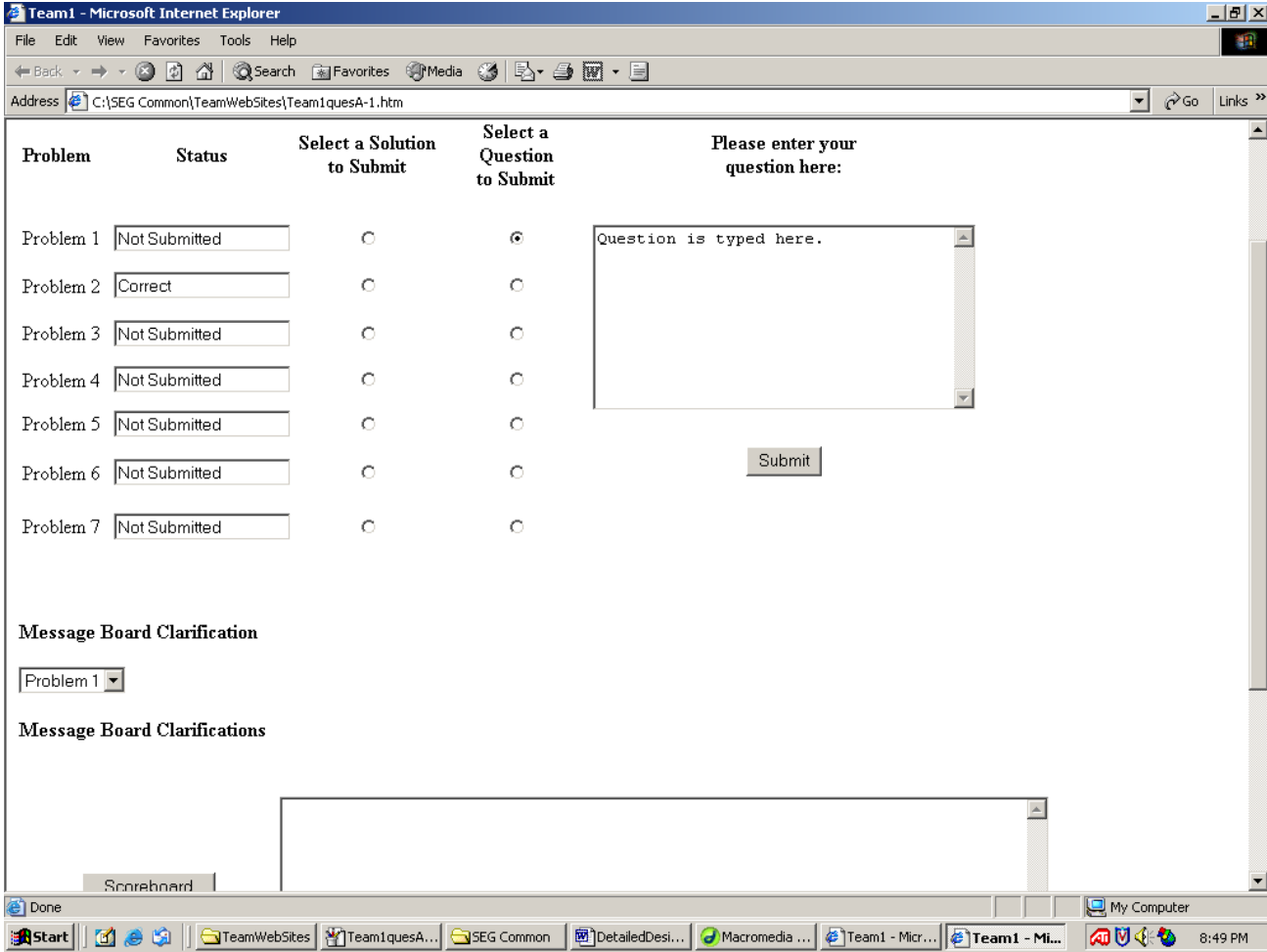
The status bar changes to correct or incorrect after the judge completes their evaluation of the team's solution to the specific problem.

Team 1 Question A



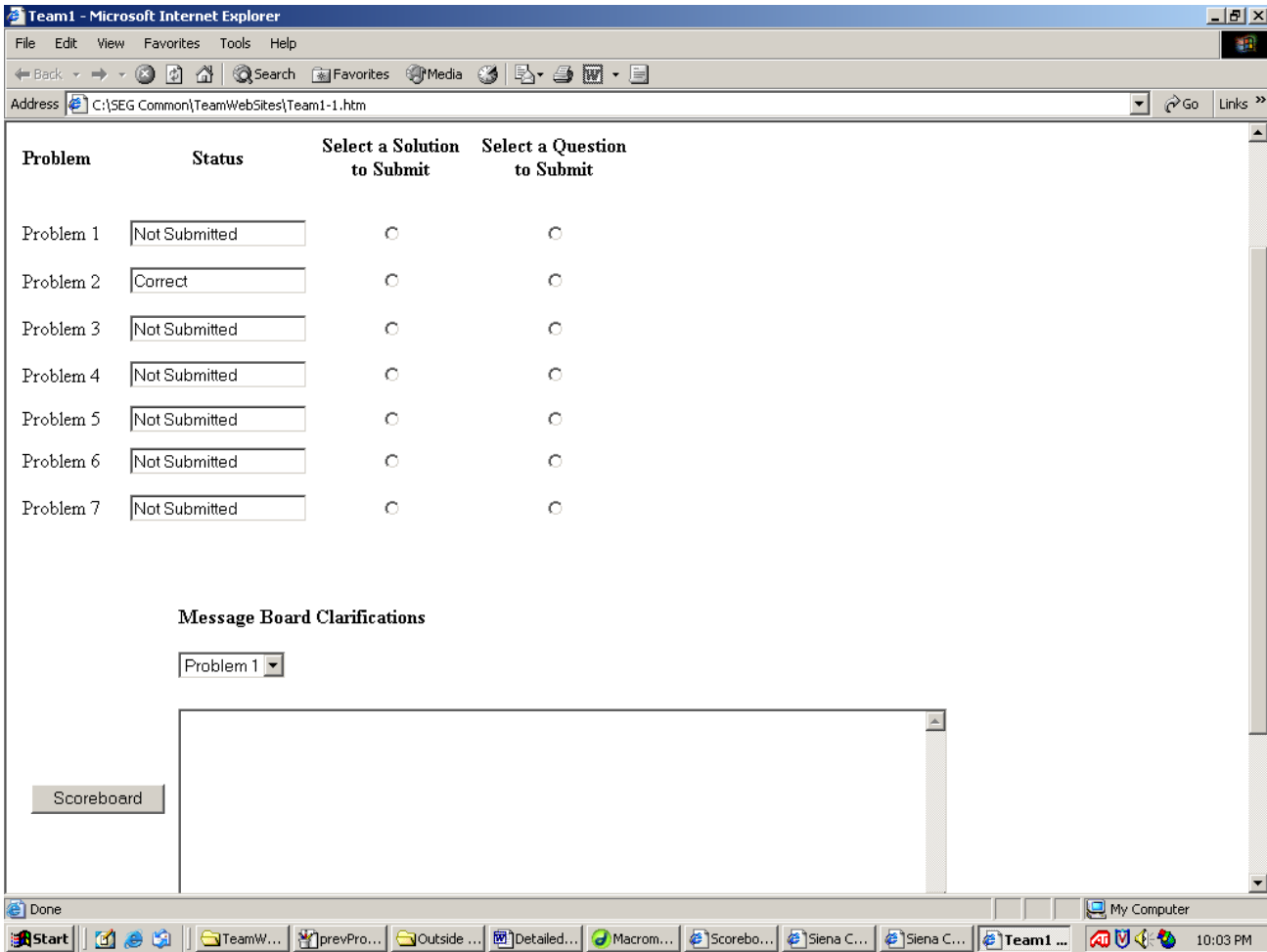
If a team wants to ask a question about a specific problem, they select the radio button for that problem in the “Select a Question to Submit” column. A text box then appears where the team types their question that they need to ask.

Team 1 Question B



The team then types the question they want to ask in the text box. Once the question is typed in the text box, the team clicks the submit button and the question is sent to the judges for them to answer.

Team 1



Once the team submits their question, they are returned to their original screen where they can submit problem answers or ask other questions for specific problems.

Team 1 Message Board

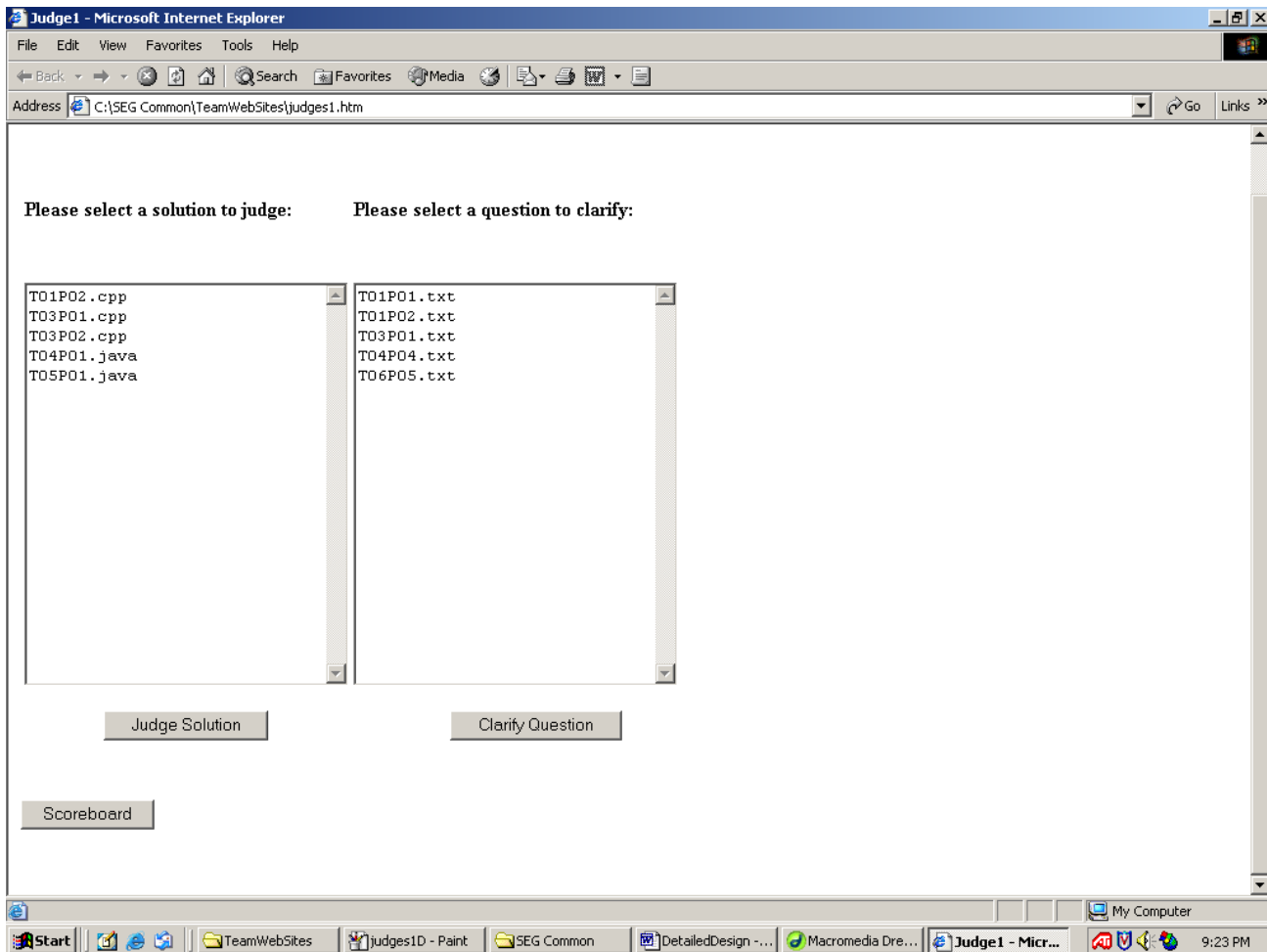
The screenshot shows a web browser window titled "Team1 - Microsoft Internet Explorer". The address bar shows the URL "C:\SEG Common\TeamWebSites\Team1msgboardA.htm". The main content area contains a table with the following structure:

Problem	Status	Select a Solution to Submit	Select a Question to Submit
Problem 1	Not Submitted	<input type="radio"/>	<input type="radio"/>
Problem 2	Correct	<input type="radio"/>	<input type="radio"/>
Problem 3	Not Submitted	<input type="radio"/>	<input type="radio"/>
Problem 4	Not Submitted	<input type="radio"/>	<input type="radio"/>
Problem 5	Not Submitted	<input type="radio"/>	<input type="radio"/>
Problem 6	Not Submitted	<input type="radio"/>	<input type="radio"/>
Problem 7	Not Submitted	<input type="radio"/>	<input type="radio"/>

Below the table, there is a section titled "Message Board Clarifications". It features a dropdown menu currently set to "Problem 1". Below the dropdown is a text box containing the text: "Judges answer to the team's questions for the problem selected in the drop down menu." To the left of the text box is a button labeled "Scoreboard".

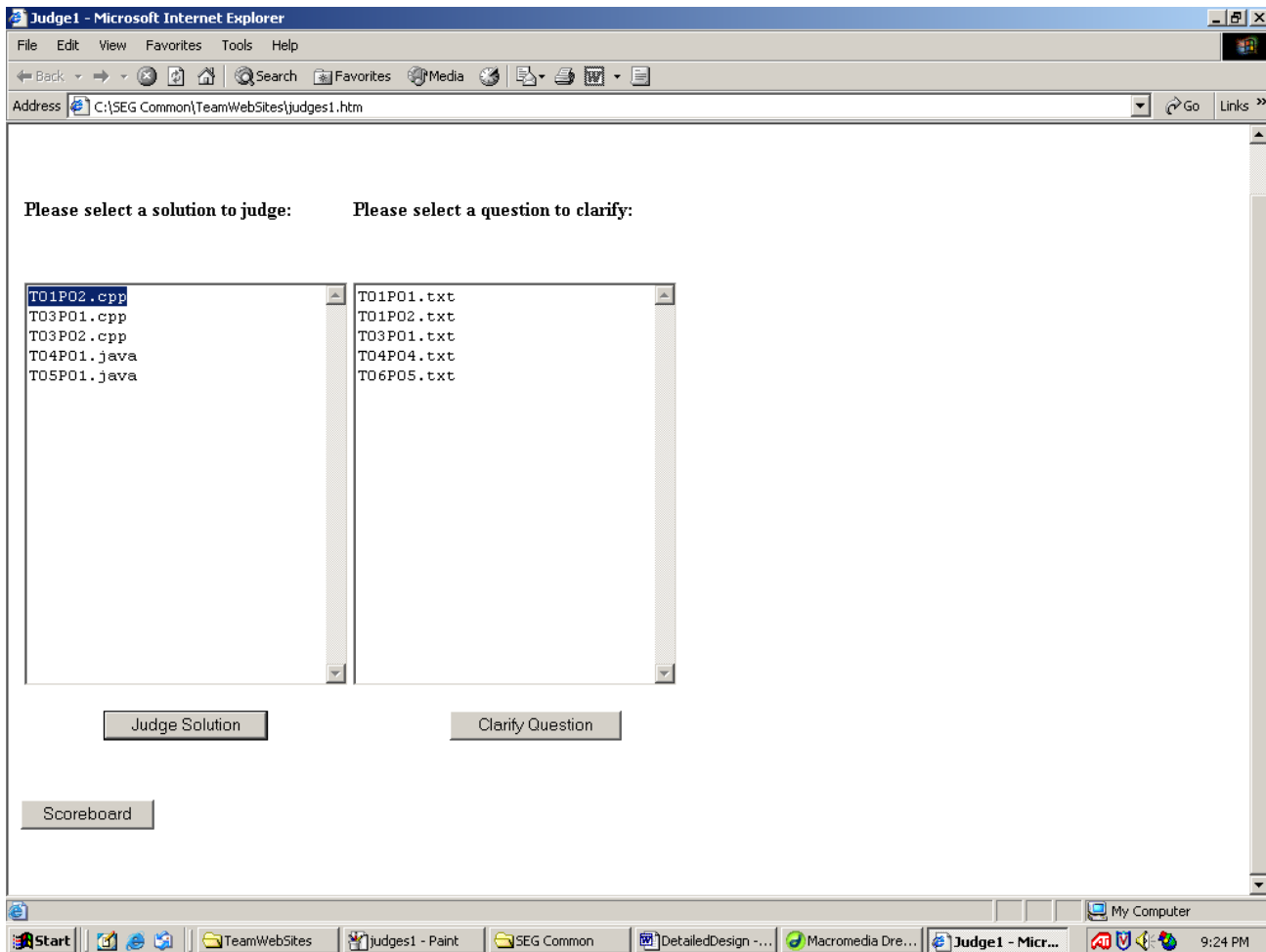
If a team wants to see what other teams have asked about a certain problem and the judges answers, then the select the desired problem in the drop down menu. Once they do that, the questions and answers will appear in the text box for the selected problem.

Judges 1



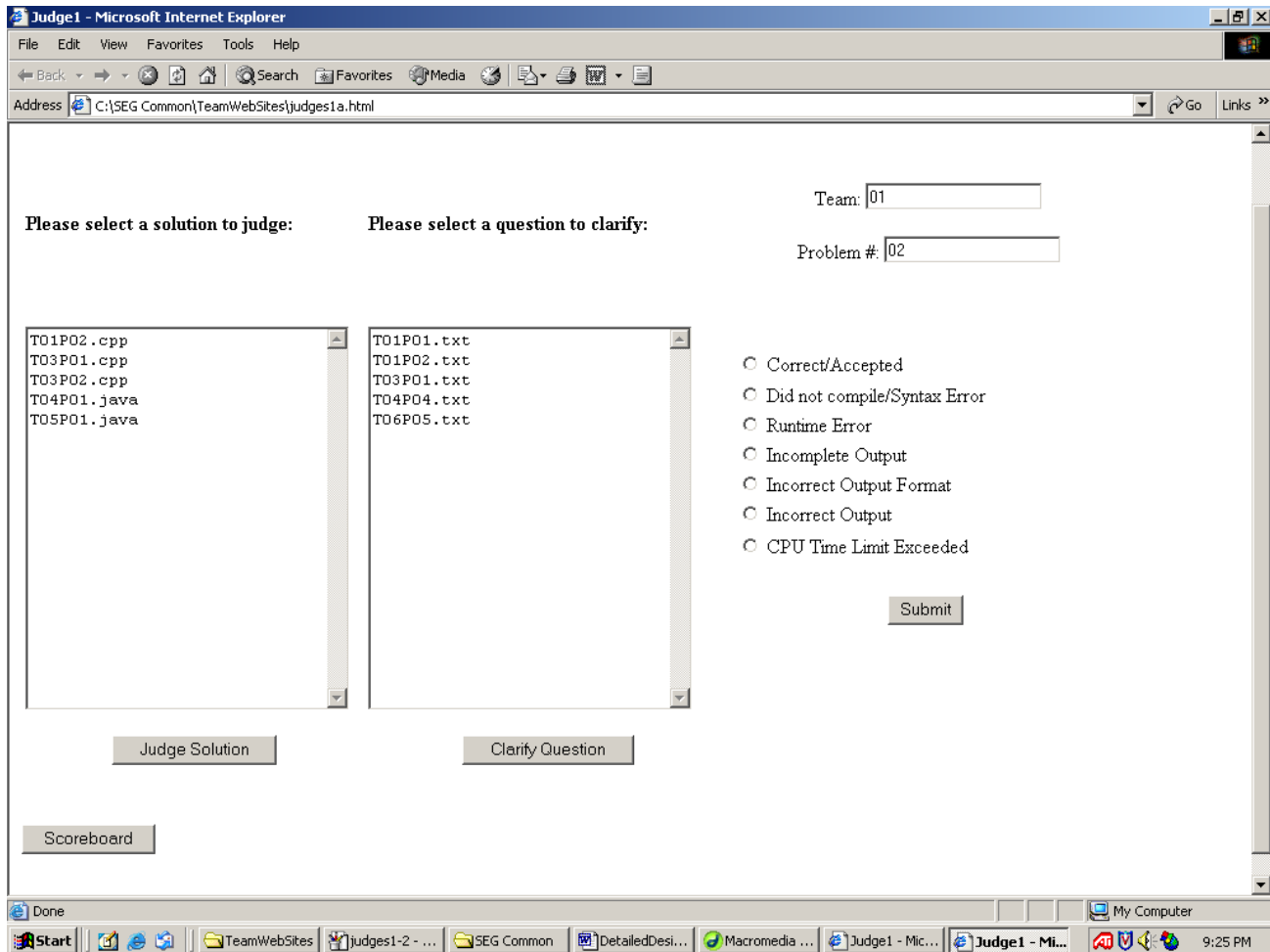
This is the main page that the judges will see when they start the software. It contains two text boxes that list all the problems and questions submitted by the teams for the judges to evaluate and clarify. The scoreboard button is a link to the contest scoreboard.

Judges 1A



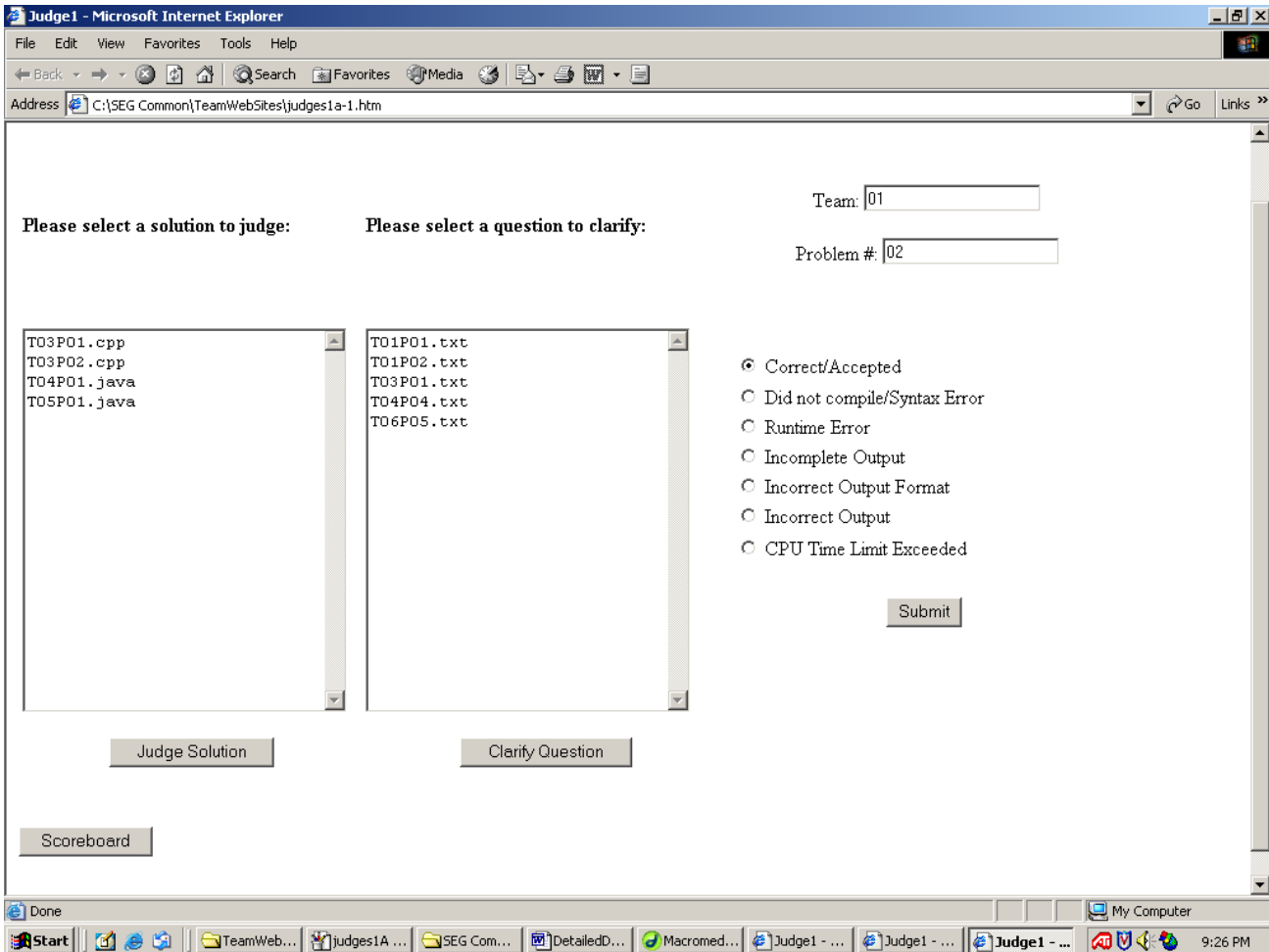
If a judge wants to evaluate one of the answer subitted by the team, he/she click the desired file, it will then highlight. The judge then clicks the button “Judge Solution”. The judge then is sent the file for them to look at.

Judges 1B



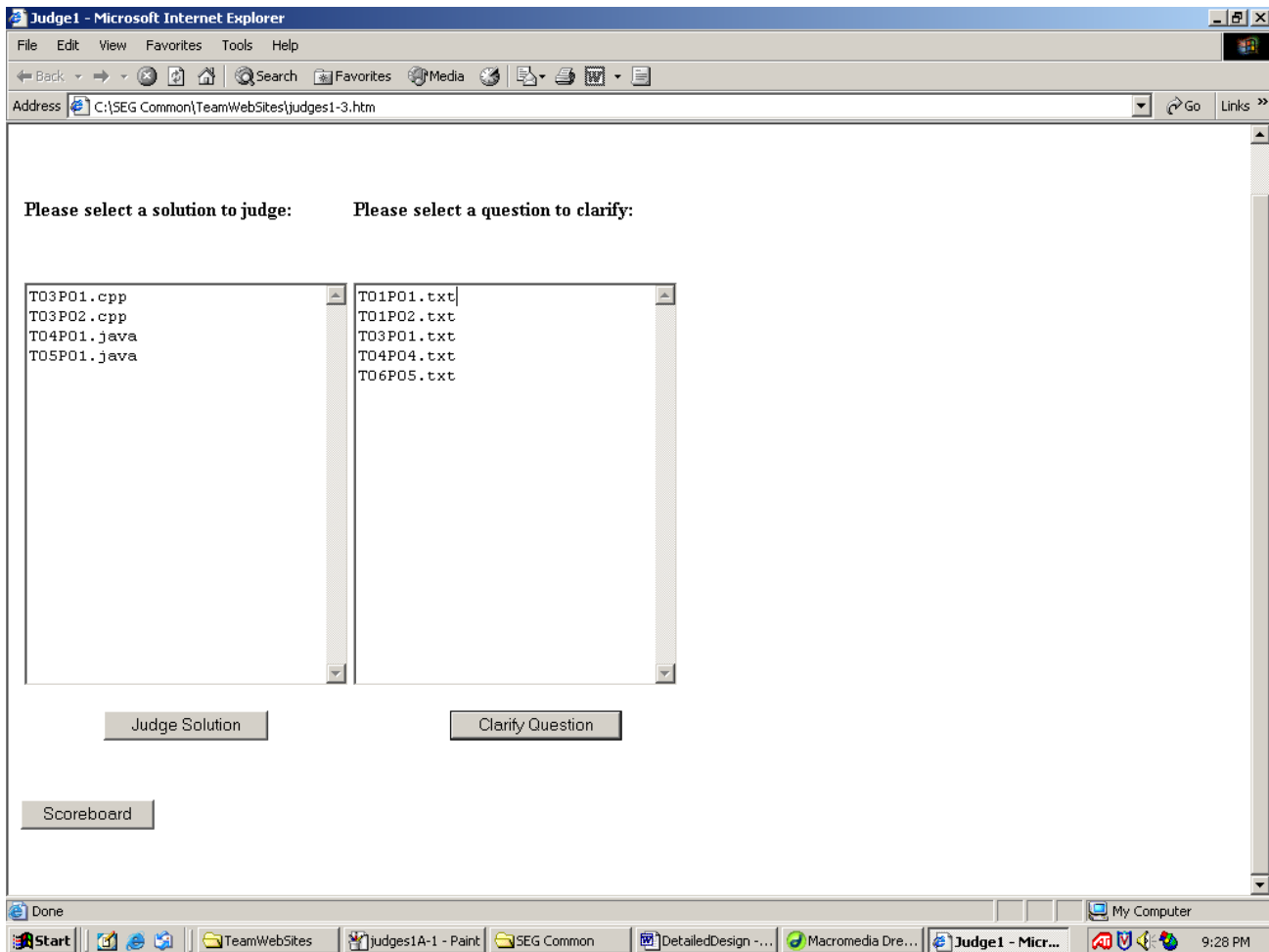
After the judge presses the “Judge Solution” button, the team and problem number appears in the top right hand corner that they are choosing to respond to based on their evaluation of the teams answer. Also a bunch of radio buttons appear with the different responses the judge can use.

Judges 1C



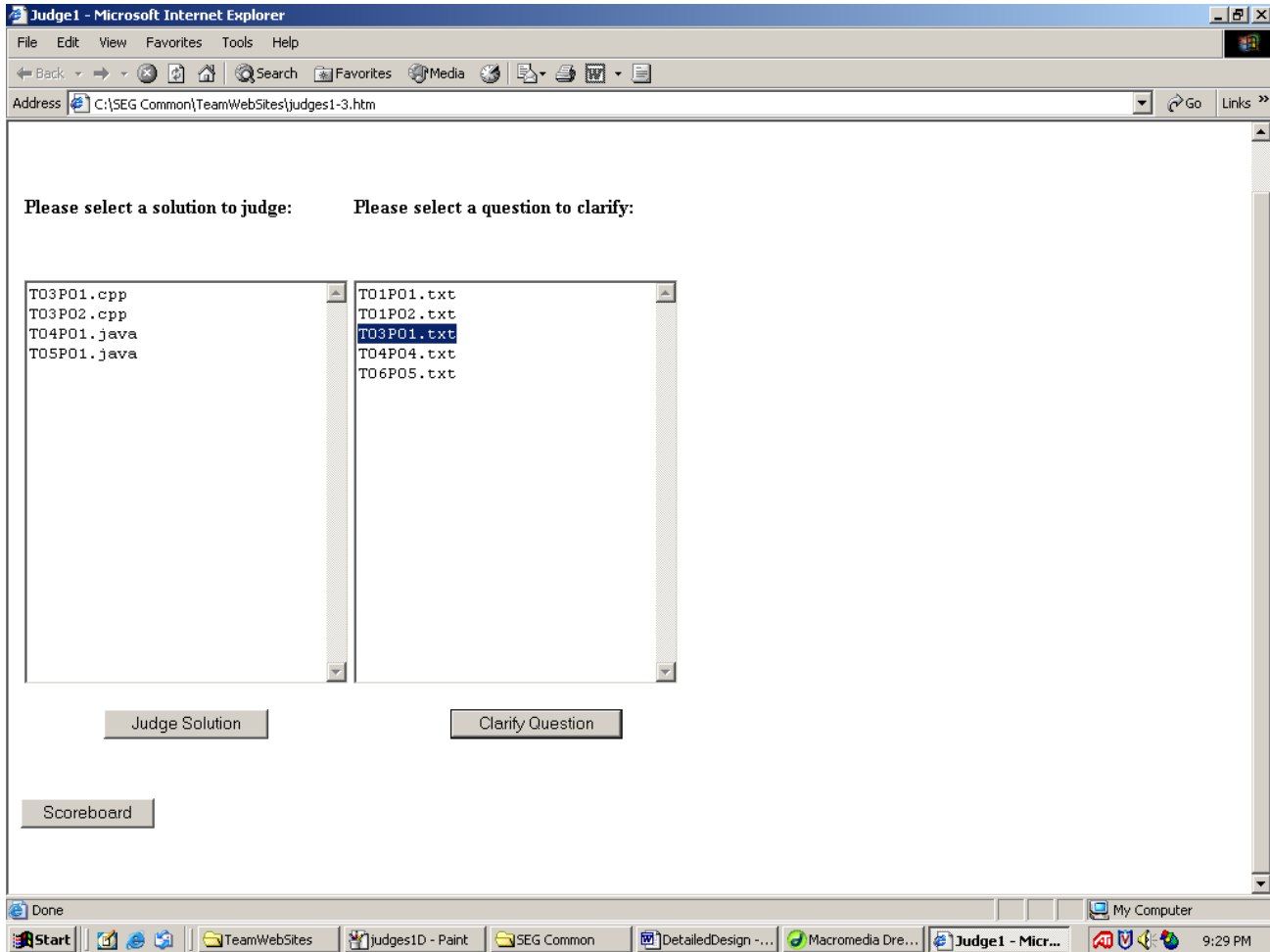
The judge then selects the radio button for the response they want to send to the team. Once the radio button is selected, the judge clicks the submit button and the response is sent to the team for that problem.

Judges 1D



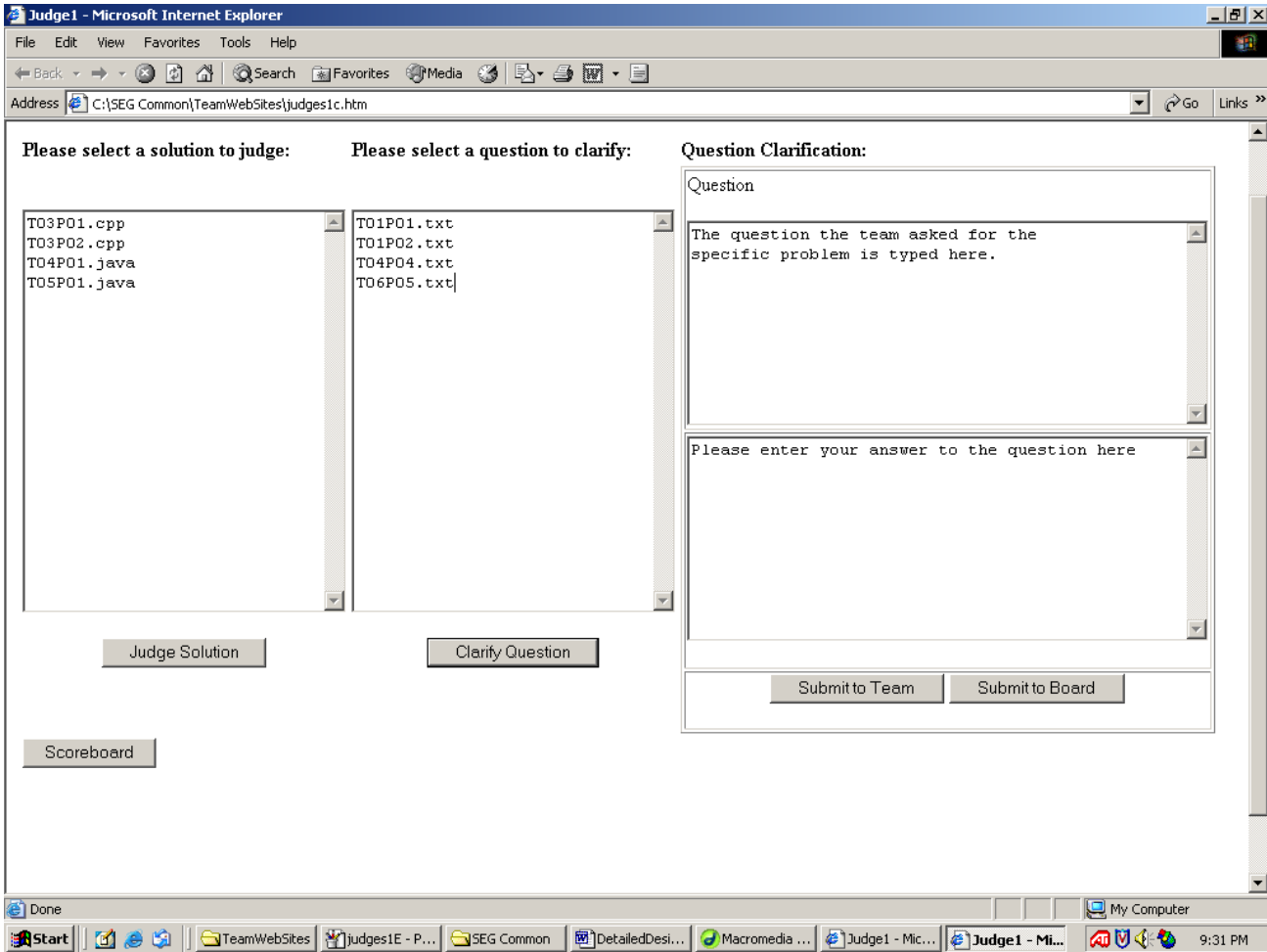
Once the judge sends their response to the team, he/she is returned to their original screen and can choose judge a solution or clarify a question.

Judges 1E



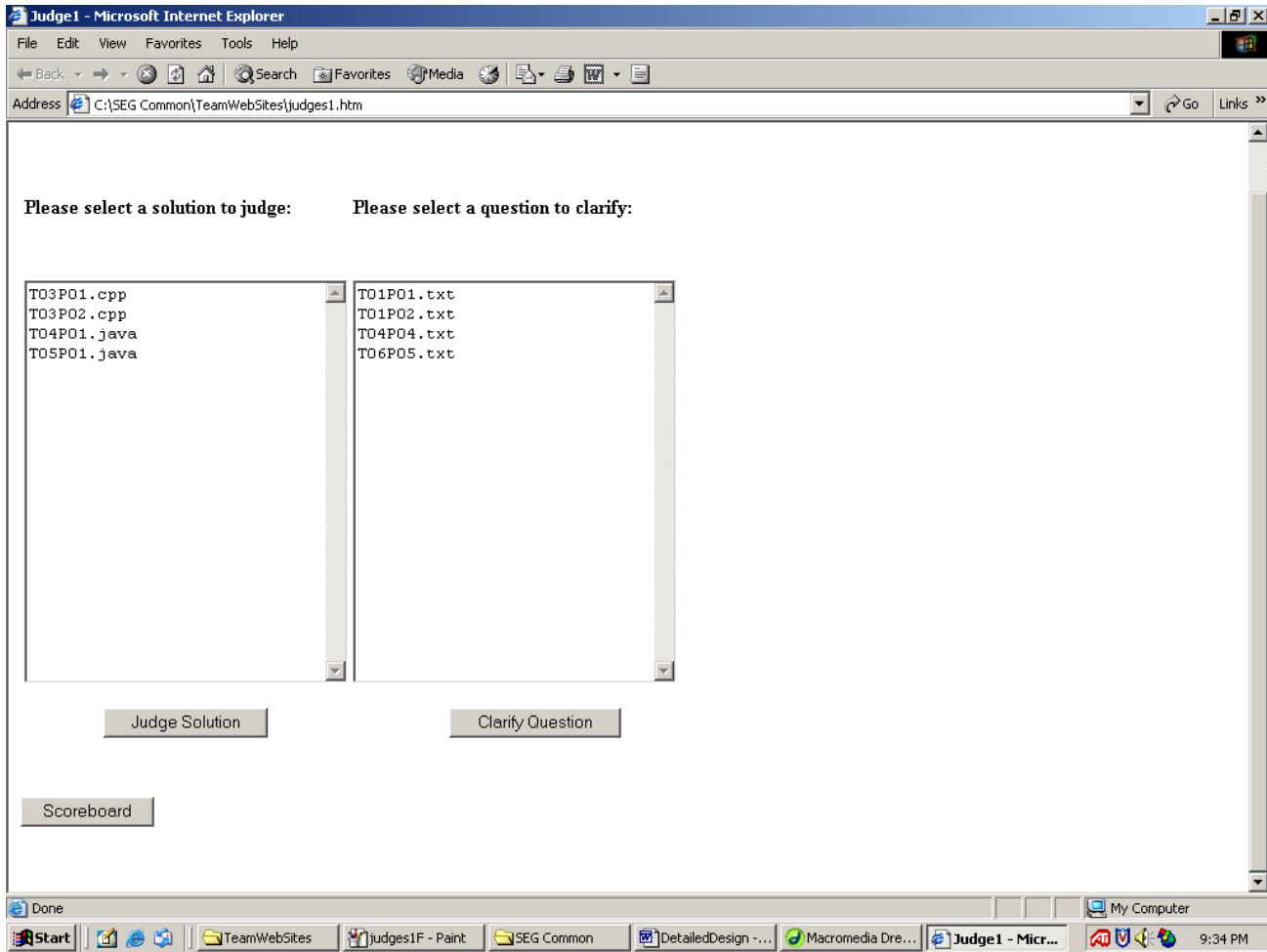
If a judge wants to clarify a question, he/she highlights the desired question by clicking on it. They then click the “Clarify Question” button.

Judges 1F



When the judge clicks the clarify question button, two more text boxes appear. One text box contains the question that the team asked. The other text box is where the judge types their answer. Once the judge types their answer in the text box, they then decide if they want to submit the question to the team individually or to the message board by clicking the appropriate button.

Judges 1G



After the judge submits there answer to the question, the judge is brought back to the original screen where he/she can judge another solution or clarify another question.

Blank Scoreboard

Siena College High School Programming Contest Scoreboard

17 March 2004 - 9:00 am - 12:00 pm

(Time Submitted | Elapsed Time)

	1	2	3	4	5	6	7	Correct Solutions	Total Elapsed Time (hours)
Bethlehem									
Shaker									
Guilderland									
Mechanicville									
Niskyuna									
Troy									
Albany									
Schenectady									
Brunswick									

This is how the scoreboard looks before any of problems are submitted. For each problem submitted, the time the problem was submitted is shown as the elapsed time. The number of correct solutions is shown along with the total elapsed time. These two elements are used for ranking the teams.

Updated Scoreboard

Siena College High School Programming Contest Scoreboard

17 March 2004 - 9:00 am - 12:00 pm

(Time Submitted | Elapsed Time)

	1	2	3	4	5	6	7	Correct Solutions	Total Elapsed Time (hours)
Bethlehem	9:30 0:30		10:00 1:00					2	1:30
Shaker								0	
Guilderland								0	
Mechanicville			9:20 0:20					1	0:20
Niskyuna		10:00 1:00			11:00 2:00			2	3:00
Troy								0	
Albany								0	
Schenectady								0	
Brunswick								0	

This is an example of the scoreboard after teams have submitted their correct answers to the problems.

Updated Scoreboard #2

Siena College High School Programming Contest Scoreboard

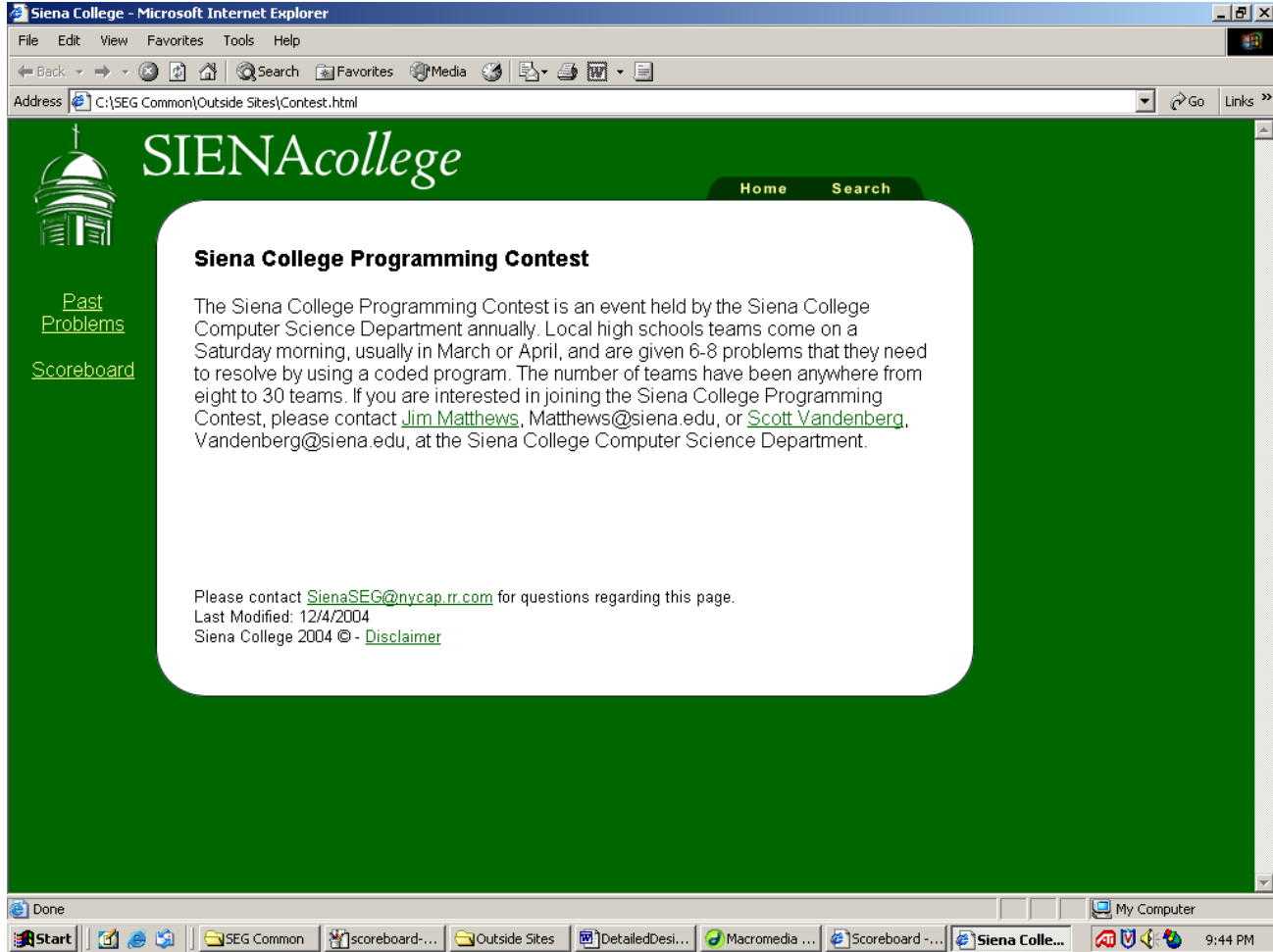
17 March 2004 - 9:00 am - 12:00 pm

(Time Submitted | Elapsed Time)

	1	2	3	4	5	6	7	Correct Solutions	Total Elapsed Time (hours)
Bethlehem	9:30 0:30		10:00 1:00					2	1:30
Shaker								0	
Guilderland								0	
Mechanicville			9:20 0:20					1	0:20
Niskiyuna		10:00 1:00			11:00 2:00			2	3:00
Troy								0	
Albany								0	
Schenectady	11:30 1:30							1	1:30
Brunswick								0	

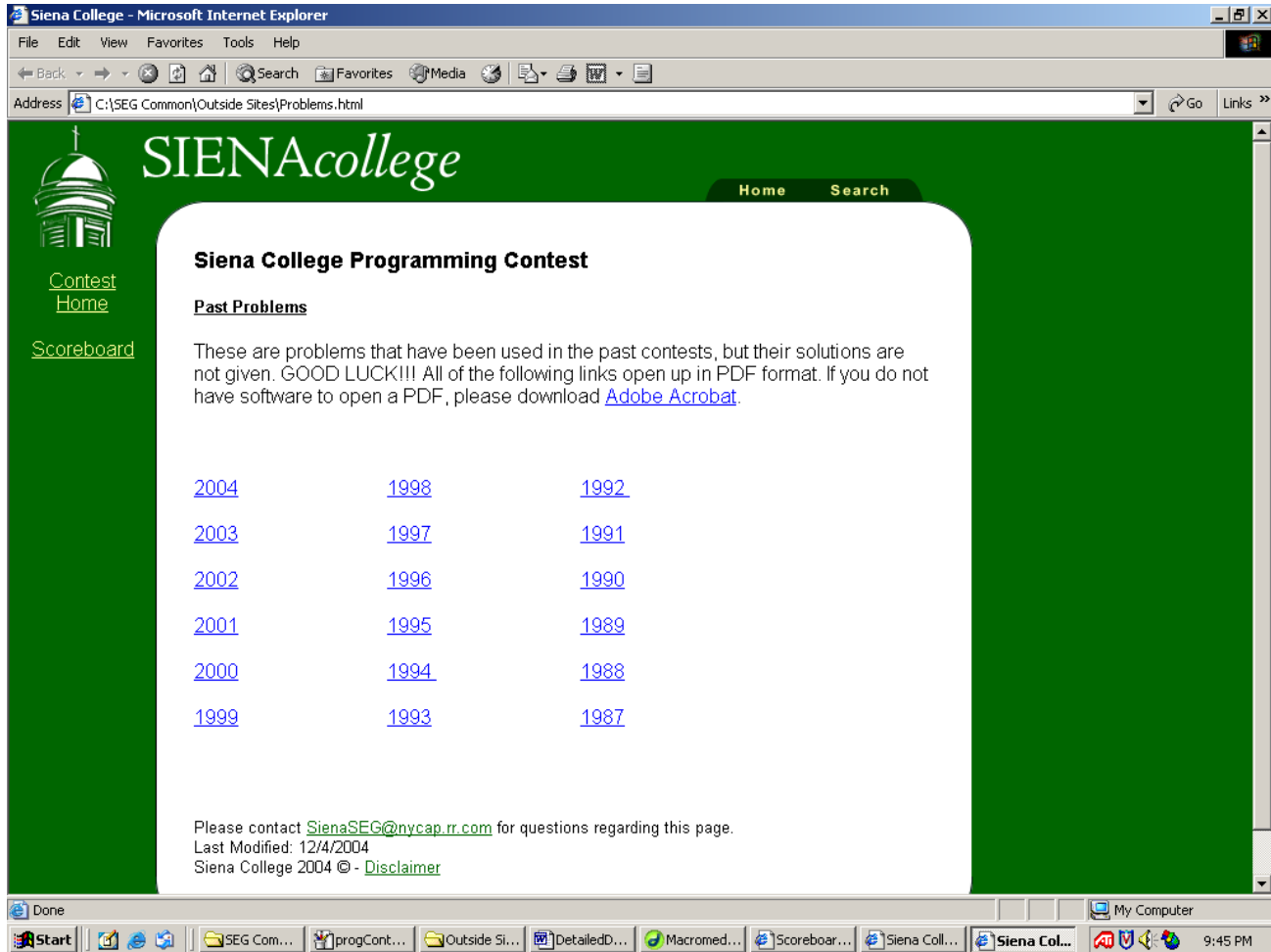
This is another example of the scoreboard with more correct problems submitted and correct.

Programming Contest Home Page



This is the home page of the programming contest. It gives a brief description of what the contest is and how it runs. The page contains links to past problems and the scoreboard of most current contest as well as past scoreboards. It also contains links to email Jim Matthews, Scott Vandenburg and SEG.

Previous Contest Problems



If you click on the link for the past problems, this page comes up. It contains links to all the past years problems and scoreboards for anyone to look at. It also contains a link to return to the contest's home page and the scoreboard.

Testing Requirements

Section 1.2: User Command Summary

In this section, each prototype shown in the section above will be explained.

Team Websites: The team website will be equipped with the list of each problem and the teams status of that problem in a status bar. The status bar will tell a team whether that problem has not been submitted, has been submitted but has not been judged, it is in the process of being judged, or if it was correct and accepted. If the team's solutions are incorrect, a specific message will pop up into the status bar to tell the team what was wrong with their solution. Also when the teams get to the scoreboard but clicking the button on the bottom of the screen called "Scoreboard", which will open a new web browser and bring them to the scoreboard. Teams may also view the message boards of different problems by choosing what problem they would like to view the clarifications for, and the message board will automatically pop up.

Finally, the teams may use their website to submit solutions and questions to the judges. If a team chooses to submit a solution, they must choose a radio button below "Select a Solution to Submit" with the according problem. Once they choose that, a section to choose the language in which the problem was completed in is popped up (seen in TeamA website), and the team needs to make this selection and then hit submit, which will find the appropriate file and submits it. (In order to submit files correctly, teams will be notified to use a specific naming convention when creating solutions as well as to place them in a particular place in order to allow for a clean submission.) In order to submit the solutions, a team will name their files T##P##.extension (T stands for team, first set of numbers is team number, P stands for problem, second set of numbers is for problem number, and extension is .cpp for C file, and .java for Java file). When a team submits their solution, it takes a copy of the file they created in their directory, and places it into a directory on Turing called "Submitted not Judged", that all the judges have access to. If a team selects to submit a question to the judges, the team selects a radio button under "Select a Question to Submit" for a particular question. When this is selected, a section to type a question to the judges is popped up (as seen on TeamB Website), and the team can now type in their question and hit the submit button to submit it to the judges. When a team submits a question, it will put it in a form of a text file in a directory on Turing called "Questions Submitted"

Judges Websites: When the judges get their website, there will be two separate queues, one with all of the solutions submitted by the teams, and another with all of the questions submitted by the teams. (Each item in the queues will depict which team submitted the solution/question, and what problem it was submitted for.)

JudgeA: If a judge decides to judge a submitted solution, they will pick what solution they would like to judge, and hit the "Judge Solution" button. When this button is selected, a new section is popped up onto the website listing the team who submitted the solution and what problem was submitted, as well as moving the selected solution from the "Submitted not Judged" directory to the "Being Judged" directory on Turing. Once they are here, judges are on their own to go off and judge the submitted solution (judges will have directions to follow on how to do this). Once they are done judging the solution, they can respond to the team by selecting the response by choosing one of the radio buttons, and clicking the submit button to

send the response, as well as moving the file from “Being Judged” directory to the “Correct” or “Incorrect” Directory. (The head judge predetermines the responses back to the teams.)

JudgeB: If a judge wants to clarify a question sent by one of the teams, he/she can select a question to clarify and click the “Clarify Question” button, which will pull the file out of the “Questions Submitted” directory on Turing. Once this happens, a new section is popped up where the question is in one text area, and there is a spot for the judges to answer the question in the area depicted “Please enter your answer to the question here.” The judge then types in their response to the teams, and can decide to send it to the team that sent the question, or send it to the entire message board. (The head judge determines the logistics of which clarifications should be sent to the team itself and which ones should go to the message board.) The judges can also view the scoreboard by clicking the “Scoreboard” button that will bring up a new web browser with the scoreboard.

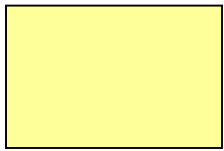
Contest Home Page: The contest home page is available to anyone that has access to the Internet. This page will contain some information about the contest, as well as having a contact if someone wanted to join the contest. This will also have links to pages for the scoreboard for the current/latest contest that is/had occur(ed), and a page with problems used in previous contests.

Previous Problems Page: This page will have links to Word files that will have problems from previous years that anyone can see.

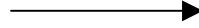
Scoreboard: The scoreboard will have each team listed as well as each problem. The time a team finishes a problem will be shown underneath the problem number by each team’s name. The teams will be ranked based on the number of correct solutions as well as the amount of time used to submit the solutions. While the standings change, the ranking on the scoreboard will reflect that change. Scoreboard1 is a sample scoreboard with the teams in ranked order, with the top team being in the lead, and the bottom being in last. A few minutes later, Scoreboard2 depicts what happens when the site is changed, and a team takes over the lead from another team.

Section 1.3 Detailed Data Flow Diagrams

Legend:



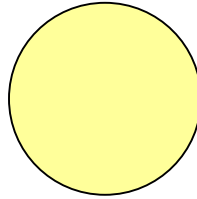
External Entity



Data Flow

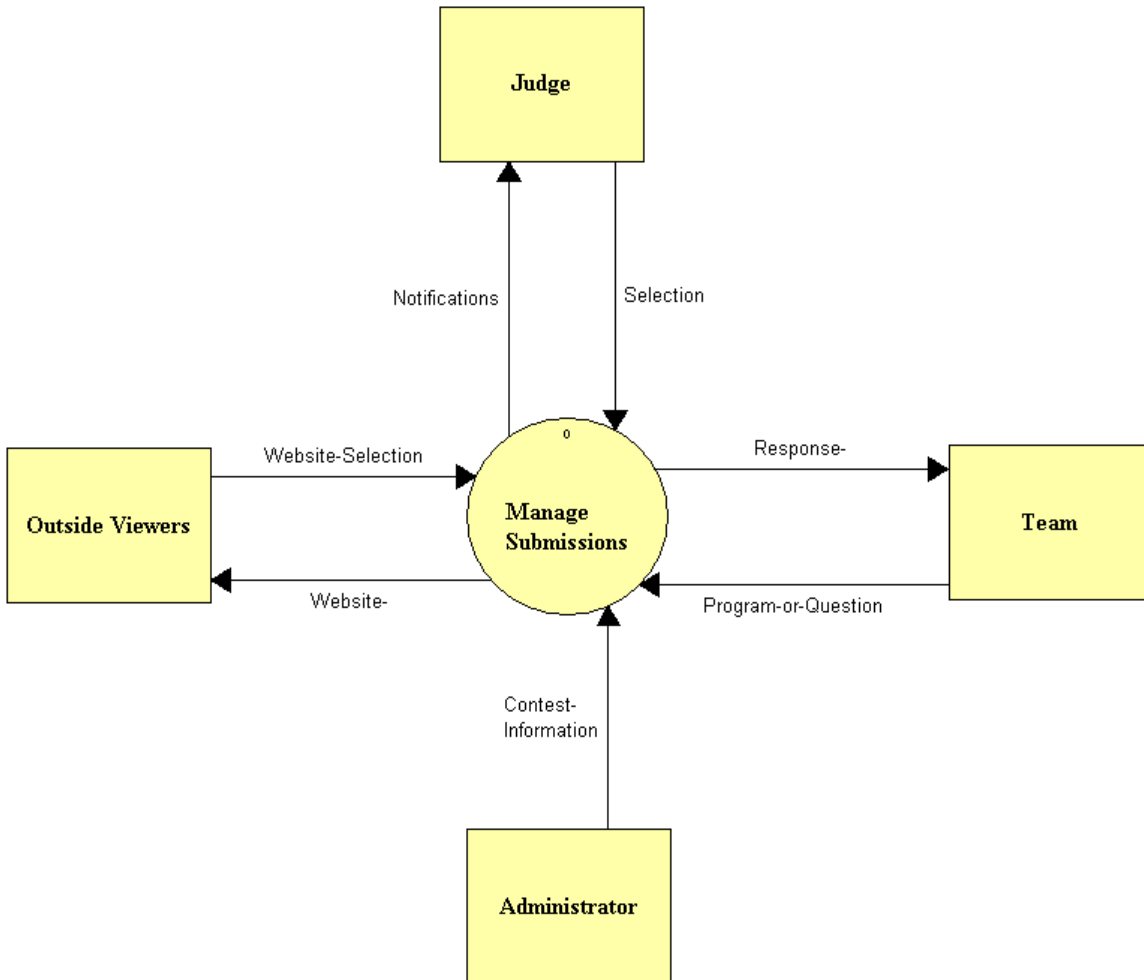


Data Store

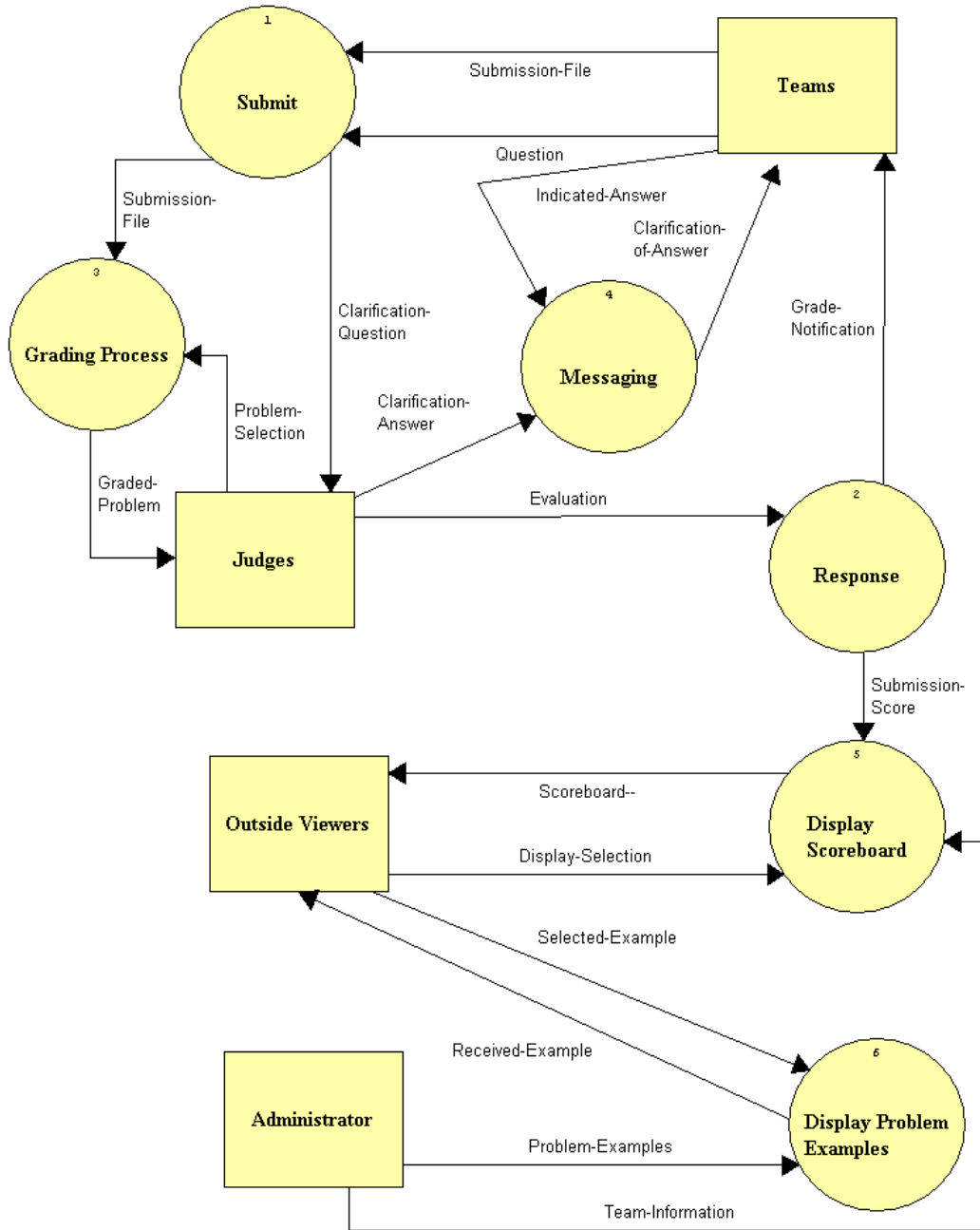


Process

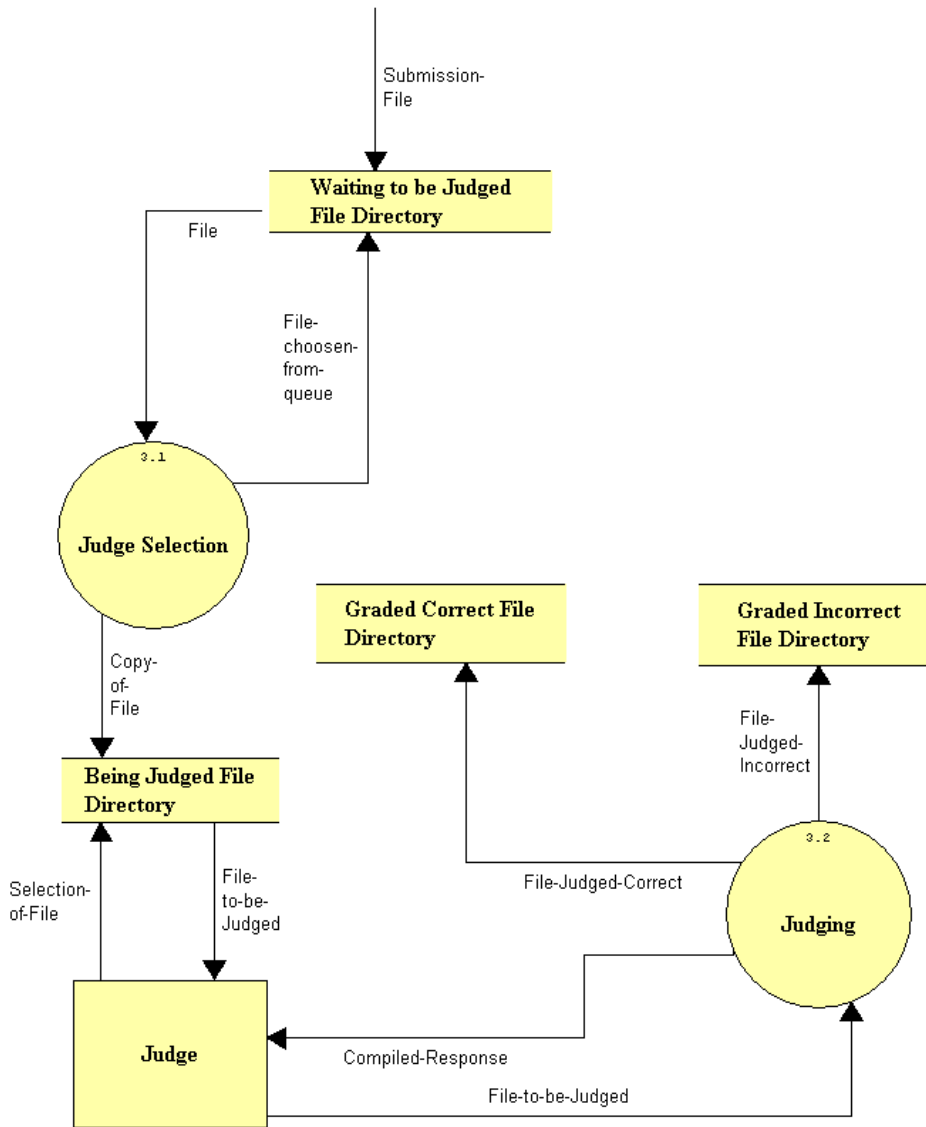
Context Diagram



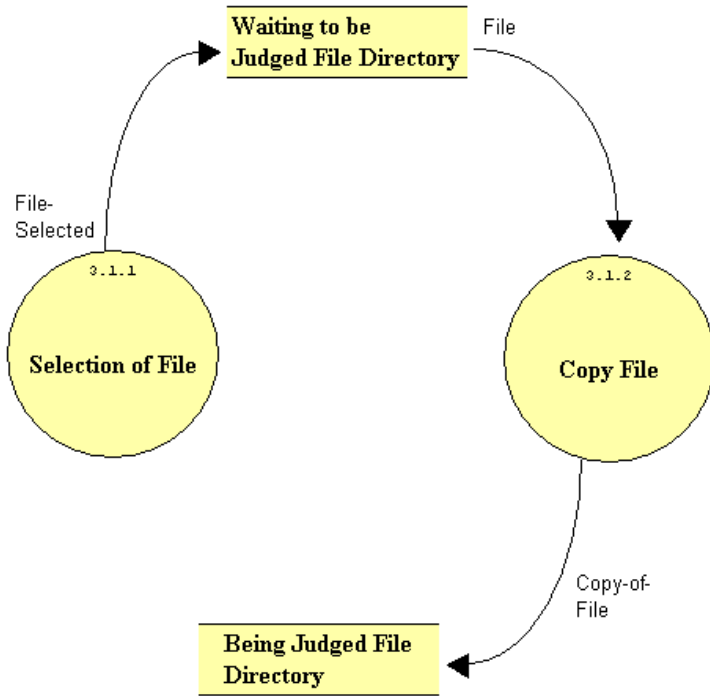
Level 0 – Manage Submissions:



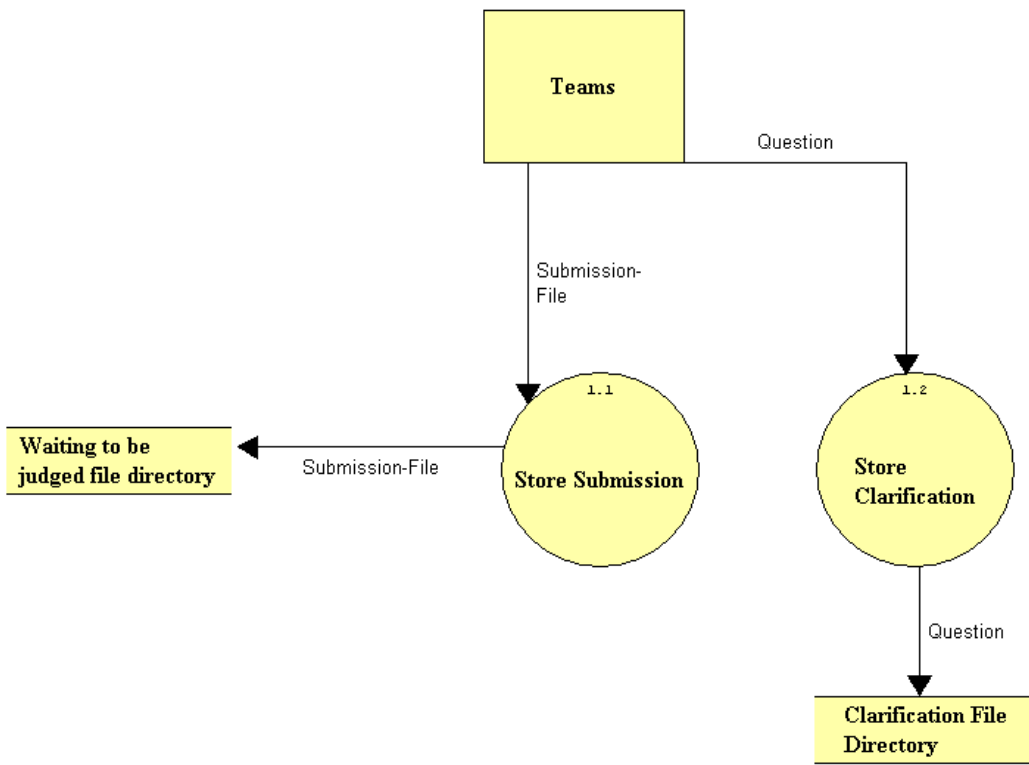
Level 1 – Grading Process:



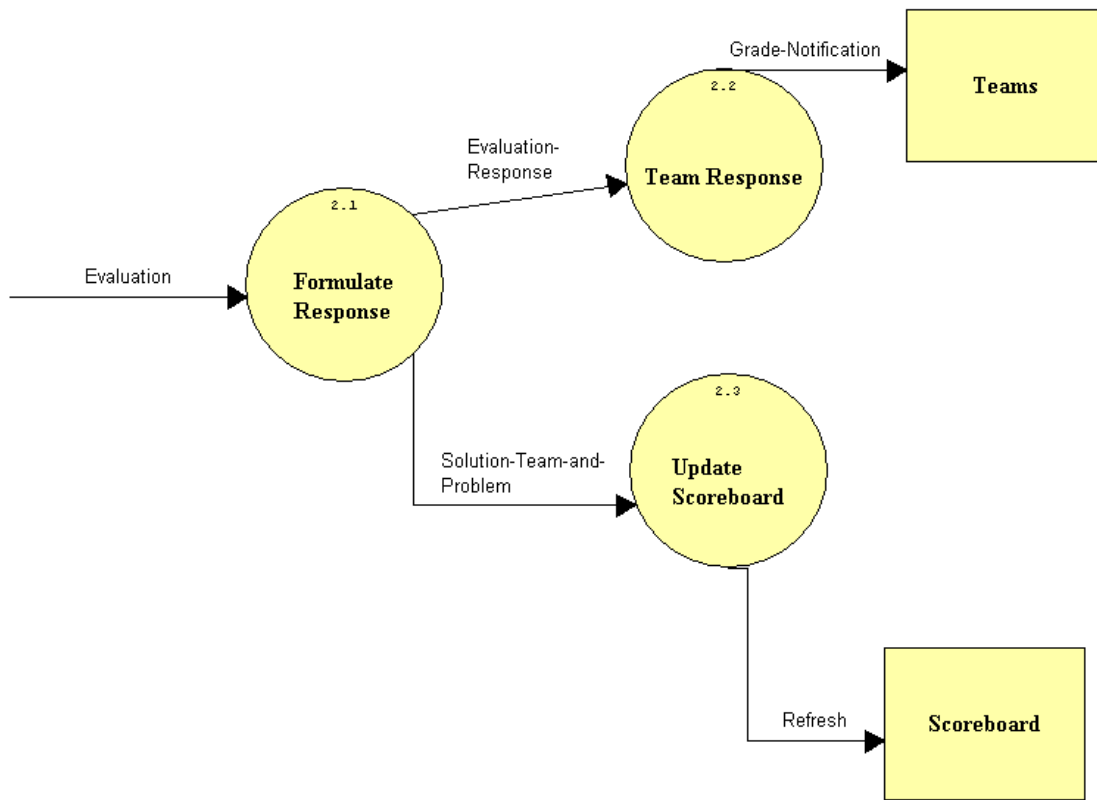
Level 2 – Judge Selection:



Level 1 – Submit:



Level 1 - Response:



Data Flow Diagram Detailed Listings:

Date: 12/6/2004 *Project:* SEG *Page:* 1

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Administrator Source/Sink

Description:

Person who has to maintain the submission software by updating the team names on the scoreboard and th

Location:

Context Diagram (CONTEXT)

Output Flows:

Contest-Information

Submission Software (0)

Output Flows:

Problem-Examples

Team-Information

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Being Judged File Directory File

Description:

File Directory where teams program is stored while being graded

Location:

Grading Process (3)

Input Flows:

Copy-of-File

Selection-of-File

Output Flows:

File-to-be-Judged

Judge Selection (3.1)

Input Flows:

Copy-of-File

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Clarification-Answer Data Flow

Description:

Answer to teams question provided by the judge

Date: 12/6/2004 *Project:* SEG *Page:* 2

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Submission Software (0)

Source: Judges (Source/Sink)

Dest: Messaging (Process)

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Clarification-of-Answer Data Flow

Programming Contest Software

Description:

The answer to the question is sent to the teams

Location:

Submission Software (0)

Source: Messaging (Process)

Dest: Teams (Source/Sink)

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Clarification-Question Data Flow

Description:

Teams question that is sent to the judges

Location:

Submission Software (0)

Source: Submit (Process)

Dest: Judges (Source/Sink)

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Clarification File Directory File

Description:

File Directory that stores all the teams questions for the judges to respond to

Date: 12/6/2004 *Project:* SEG *Page:* 3

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Submit (1)

Input Flows:

Question

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Compiled-Response Data Flow

Description:

The program is ran by the judge to see if it works correctly

Location:

Grading Process (3)

Source: Judging (Process)

Dest: Judge (Source/Sink)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Contest-Information Data Flow

Description:

Team Names,Number of Teams and Number of Problems for the contest

Location:

Context Diagram (CONTEXT)

Source: Administrator (Source/Sink)

Dest: Manage Submissions (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Copy-of-File Data Flow

Description:

Programming Contest Software

Copy of the file that the judge selected is copied and moved into being judged file directory

Date: 12/6/2004 *Project:* SEG *Page:* 4

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Grading Process (3)

Source: Judge Selection (Process)

Dest: Being Judged File Directory (File)

Judge Selection (3.1)

Source: Copy File (Process)

Dest: Being Judged File Directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Copy File Process

Description:

Process that copies file from directory to directory

Process #: 3.1.2

Location:

Judge Selection (3.1)

Input Flows:

File

Output Flows:

Copy-of-File

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Display-Selection Data Flow

Description:

User is viewing the scoreboard

Location:

Submission Software (0)

Source: Outside Viewers (Source/Sink)

Dest: Display Scoreboard (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

Date: 12/6/2004 *Project:* SEG *Page:* 5

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Display Problem Examples Process

Description:

Displays the problems for people to see

Process #: 6

Location:

Submission Software (0)

Input Flows:

Selected-Example

Problem-Examples

Output Flows:

Received-Example

Date Last Altered: 12/3/2004 *Date Created:* 11/30/2004

Display Scoreboard Process

Description:

Displays the scoreboard for people to see

Process #: 5

Location:

Submission Software (0)

Input Flows:

Submission-Score

Display-Selection

Team-Information

Output Flows:

Scoreboard--

Date Last Altered: 12/3/2004 *Date Created:* 11/30/2004

Evaluation Data Flow

Description:

Judges response to the problem

Location:

Response (2)

Date: 12/6/2004 *Project:* SEG *Page:* 6

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Source: *** Not on Diagram ***

Dest: Formulate Response (Process)

Submission Software (0)

Source: Judges (Source/Sink)

Dest: Response (Process)

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Evaluation-Response Data Flow

Description:

The judges evaluation of the submission

Location:

Response (2)

Source: Formulate Response (Process)

Dest: Team Response (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

File Data Flow

Description:

File that the judges going to grade

Location:

Grading Process (3)

Source: Waiting to be judged file directory (File)

Dest: Judge Selection (Process)

Programming Contest Software

Judge Selection (3.1)

Source: Waiting to be judged file directory (File)

Dest: Copy File (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Date: 12/6/2004 *Project:* SEG *Page:* 7

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

File-choosen-from-queue Data Flow

Description:

Judges select program to grade

Location:

Grading Process (3)

Source: Judge Selection (Process)

Dest: Waiting to be judged file directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

File-Judged-Correct Data Flow

Description:

File that is judged correctly

Location:

Grading Process (3)

Source: Judging (Process)

Dest: Graded Correct File Directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

File-Judged-Incorrect Data Flow

Description:

File that is judged incorrectly

Location:

Grading Process (3)

Source: Judging (Process)

Dest: Graded Incorrect File Directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Date: 12/6/2004 *Project:* SEG *Page:* 8

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

File-Selected Data Flow

Description:

file judges select to grade

Location:

Judge Selection (3.1)

Source: Selection of File (Process)

Dest: Waiting to be judged file directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

File-to-be-Judged Data Flow

Description:

File judge selected to grade

Location:

Grading Process (3)

Source: Being Judged File Directory (File)

Dest: Judge (Source/Sink)

Source: Judge (Source/Sink)

Dest: Judging (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Formulate Response Process

Description:

Process that judges use to respond to the teams program submission

Process #: 2.1

Location:

Response (2)

Input Flows:

Evaluation

Output Flows:

Evaluation-Response

Date: 12/6/2004 *Project:* SEG *Page:* 9

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Solution-Team-and-Problem

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Grade-Notification Data Flow

Description:

Response to teams to let them know if their program was graded correct or incorrect

Location:

Submission Software (0)

Source: Response (Process)

Dest: Teams (Source/Sink)

Response (2)

Source: Team Response (Process)

Dest: Teams (Source/Sink)

Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

Graded-Problem Data Flow

Description:

Evaluation of the problem

Location:

Submission Software (0)

Source: Grading Process (Process)

Dest: Judges (Source/Sink)

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Graded Correct File Directory File

Description:

File Directory that contains correct programs

Date: 12/6/2004 *Project:* SEG *Page:* 10

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Grading Process (3)

Input Flows:

File-Judged-Correct

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Graded Incorrect File Directory File

Description:

File Directory that contains incorrect programs

Location:

Grading Process (3)

Input Flows:

File-Judged-Incorrect

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Grading Process Process

Description:

The process that determines if the teams submitted file is correct or incorrect

Process #: 3

Location:

Submission Software (0)

Input Flows:

Submission-File

Problem-Selection

Output Flows:

Graded-Problem

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Date: 12/6/2004 *Project:* SEG *Page:* 11

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Indicated-Answer Data Flow

Description:

Team selects the answer to the question they want to see

Location:

Submission Software (0)

Source: Teams (Source/Sink)

Dest: Messaging (Process)

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Judge Source/Sink

Description:

The person that will be evaluating each teams submissions

Location:

Context Diagram (CONTEXT)

Input Flows:

Notifications

Output Flows:

Selection

Grading Process (3)

Input Flows:

File-to-be-Judged

Compiled-Response

Output Flows:

Selection-of-File

File-to-be-Judged

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Judge Selection Process

Description:

Process of judge selecting program to grade

Process #: 3.1

Date: 12/6/2004 *Project:* SEG *Page:* 12

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Grading Process (3)

Input Flows:

File

Output Flows:

File-choosen-from-queue

Copy-of-File

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Judges Source/Sink

Description:

People who determine if the submitted files by the teams are correct or incorrect using the submission sof

Location:

Submission Software (0)

Input Flows:

Clarification-Question

Graded-Problem

Output Flows:

Evaluation

Problem-Selection

Clarification-Answer

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Judging Process

Programming Contest Software

41

Detailed Design

Description:

Process of evaluating a teams program

Process #: 3.2

Location:

Grading Process (3)

Input Flows:

File-to-be-Judged

Output Flows:

File-Judged-Incorrect

File-Judged-Correct

Compiled-Response

Date: 12/6/2004 *Project:* SEG *Page:* 13

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Manage Submissions Process

Description:

Software that manages the contest

Process #: 0

Location:

Context Diagram (CONTEXT)

Input Flows:

Selection

Program-or-Question

Website-Selection

Contest-Information

Output Flows:

Notifications

Response-

Website-

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Messaging Process

Description:

Process of posting the judges answers to questions by the teams to a message board for either all the team

Process #: 4

Location:

Submission Software (0)

Input Flows:

Clarification-Answer

Indicated-Answer

Output Flows:

Clarification-of-Answer

Date Last Altered: 11/1/2004 *Date Created:* 11/1/2004

Date: 12/6/2004 *Project:* SEG *Page:* 14

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

Programming Contest Software

All Entries -- Data Flow Diagrams

Notifications Data Flow

Description:

Notifys judges that there is a new program to be graded or a question needs to be answered

Location:

Context Diagram (CONTEXT)

Source: Manage Submissions (Process)

Dest: Judge (Source/Sink)

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Notify-Grade Data Flow

Description:

Notify team if they got the problem correct or incorrect

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Outside Viewers Source/Sink

Description:

People outside the contest who want to view the current status of the contest or prior problems

Location:

Submission Software (0)

Input Flows:

Scoreboard--

Received-Example

Output Flows:

Display-Selection

Selected-Example

Context Diagram (CONTEXT)

Input Flows:

Website-

Output Flows:

Website-Selection

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Date: 12/6/2004 *Project:* SEG *Page:* 15

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Problem-Examples Data Flow

Description:

New examples of previous years contests.

Location:

Submission Software (0)

Source: Administrator (Source/Sink)

Dest: Display Problem Examples (Process)

Date Last Altered: 12/3/2004 *Date Created:* 11/30/2004

Problem-Selection Data Flow

Description:

Problem that judge selects to judge

Location:

Submission Software (0)

Source: Judges (Source/Sink)

Dest: Grading Process (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Program-or-Question Data Flow

Description:

Submission by teams of their program or question for clarification

Location:

Context Diagram (CONTEXT)

Source: Team (Source/Sink)

Dest: Manage Submissions (Process)

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Date: 12/6/2004 *Project:* SEG *Page:* 16

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Question Data Flow

Description:

Teams question about a certain problem

Location:

Submission Software (0)

Source: Teams (Source/Sink)

Dest: Submit (Process)

Submit (1)

Source: Teams (Source/Sink)

Dest: Store Clarification (Process)

Source: Store Clarification (Process)

Dest: Clarification File Directory (File)

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Received-Example Data Flow

Description:

A problem a outside user decides to view

Location:

Submission Software (0)

Source: Display Problem Examples (Process)

Dest: Outside Viewers (Source/Sink)

Date Last Altered: 12/3/2004 *Date Created:* 11/30/2004

Refresh Data Flow

Description:

Updates the scoreboard

Location:

Response (2)

Date: 12/6/2004 *Project:* SEG *Page:* 17

Time: 2:11:43 PM

Detailed Listing -- Alphabetically
All Entries -- Data Flow Diagrams

Source: Update Scoreboard (Process)
Dest: Scoreboard (Source/Sink)
Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Response Process

Description:
Process that sends the judges evaluation to the teams and to the scoreboard for updating
Process #: 2
Location:
Submission Software (0)
Input Flows:
Evaluation
Output Flows:
Grade-Notification
Submission-Score
Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Response- Data Flow

Description:
Response back to teams of their submission of program or clarification question
Location:
Context Diagram (CONTEXT)
Source: Manage Submissions (Process)
Dest: Team (Source/Sink)
Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Scoreboard Source/Sink

Description:
Shows current status of teams in the contest
Date: 12/6/2004 *Project:* SEG *Page:* 18
Time: 2:11:43 PM
Detailed Listing -- Alphabetically
All Entries -- Data Flow Diagrams

Location:

Response (2)
Input Flows:
Refresh
Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Scoreboard-- Data Flow

Description:
Scoreboard is displayed on the viewers monitor
Location:
Submission Software (0)
Source: Display Scoreboard (Process)
Dest: Outside Viewers (Source/Sink)

Date Last Altered: 12/3/2004 *Date Created:* 11/30/2004

Selected-Example Data Flow

Description:

The example problem that the outsider viewer wants to see

Location:

Submission Software (0)

Source: Outside Viewers (Source/Sink)

Dest: Display Problem Examples (Process)

Date Last Altered: 12/3/2004 *Date Created:* 12/3/2004

Selection Data Flow

Description:

Judges selection of either a program to judge or a question to clarify

Date: 12/6/2004 *Project:* SEG *Page:* 19

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Context Diagram (CONTEXT)

Source: Judge (Source/Sink)

Dest: Manage Submissions (Process)

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Selection-of-File Data Flow

Description:

File judge selects to grade

Location:

Grading Process (3)

Source: Judge (Source/Sink)

Dest: Being Judged File Directory (File)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Selection of File Process

Description:

Judges select file to be graded

Process #: 3.1.1

Location:

Judge Selection (3.1)

Output Flows:

File-Selected

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Solution-Team-and-Problem Data Flow

Description:

Team Name, Problem Number and Time

Date: 12/6/2004 *Project:* SEG *Page:* 20

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Location:

Response (2)

Source: Formulate Response (Process)

Dest: Update Scoreboard (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Store Clarification Process

Description:

Process that takes a teams question and stores it in the Clarification File Directory

Process #: 1.2

Location:

Submit (1)

Input Flows:

Question

Output Flows:

Question

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Store Submission Process

Description:

Process that takes the submission file and moves it to the waiting to be judged file directory

Process #: 1.1

Location:

Submit (1)

Input Flows:

Submission-File

Output Flows:

Submission-File

Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Date: 12/6/2004 *Project:* SEG *Page:* 21

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Submission-File Data Flow

Description:

Teams answer to the problem

Location:

Submission Software (0)

Source: Teams (Source/Sink)

Dest: Submit (Process)

Submit (1)

Source: Teams (Source/Sink)

Dest: Store Submission (Process)

Source: Store Submission (Process)

Dest: Waiting to be judged file directory (File)

Submission Software (0)

Source: Submit (Process)

Dest: Grading Process (Process)
Grading Process (3)
Source: *** Not on Diagram ***
Dest: Waiting to be judged file directory (File)
Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Submission-Score Data Flow

Description:
Web site is updated with correct submissions
Location:
Submission Software (0)
Source: Response (Process)
Dest: Display Scoreboard (Process)
Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Date: 12/6/2004 *Project:* SEG *Page:* 22
Time: 2:11:43 PM
Detailed Listing -- Alphabetically
All Entries -- Data Flow Diagrams

Submit Process

Description:
The process that takes the teams problem answer file and sends it to other aspects of the program
Process #: 1
Location:
Submission Software (0)
Input Flows:
Submission-File
Question
Output Flows:
Clarification-Question
Submission-File
Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Team Source/Sink

Description:
The group of students who will be participating in the contest
Location:
Context Diagram (CONTEXT)
Input Flows:
Response-
Output Flows:
Program-or-Question
Date Last Altered: 11/30/2004 *Date Created:* 10/27/2004

Team-Information Data Flow

Description:
Number of Teams and Team Names for the contest
Location:
Submission Software (0)
Date: 12/6/2004 *Project:* SEG *Page:* 23

Time: 2:11:43 PM
Detailed Listing -- Alphabetically
All Entries -- Data Flow Diagrams

Source: Administrator (Source/Sink)
Dest: Display Scoreboard (Process)
Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

Team Response Process

Description:
Process that sends judges evaluation to the individual teams
Process #: 2.2
Location:
Response (2)
Input Flows:
Evaluation-Response
Output Flows:
Grade-Notification
Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

Teams Source/Sink

Description:
A team consists of high school students from the local area that are competing in the programming contest
Location:
Submission Software (0)
Input Flows:
Grade-Notification
Clarification-of-Answer
Output Flows:
Submission-File
Question
Indicated-Answer
Submit (1)
Output Flows:
Submission-File
Question
Response (2)
Input Flows:
Grade-Notification
Date: 12/6/2004 *Project:* SEG *Page:* 24
Time: 2:11:43 PM
Detailed Listing -- Alphabetically
All Entries -- Data Flow Diagrams

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Update Scoreboard Process

Description:
Process that updates scoreboard with new number of problems answered correctly and time needed to complete
Process #: 2.3

Location:

Response (2)

Input Flows:

Solution-Team-and-Problem

Output Flows:

Refresh

Date Last Altered: 11/30/2004 *Date Created:* 11/1/2004

View Data Flow

Description:

Outside entity view the website to see what place they are currently in

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Waiting to be judged file directory File

Description:

File directory that stores the submitted program to the question and is waiting to be judged

Location:

Submit (1)

Input Flows:

Submission-File

Grading Process (3)

Input Flows:

Submission-File

File-choosen-from-queue

Output Flows:

File

Judge Selection (3.1)

Date: 12/6/2004 *Project:* SEG *Page:* 25

Time: 2:11:43 PM

Detailed Listing -- Alphabetically

All Entries -- Data Flow Diagrams

Input Flows:

File-Selected

Output Flows:

File

Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

Website Source/Sink

Description:

Contains the scoreboard of the current contest along with questions from prior contests along with a set of

Date Last Altered: 11/1/2004 *Date Created:* 10/27/2004

Website- Data Flow

Description:

Website is displayed on outside viewers monitor

Location:

Context Diagram (CONTEXT)

Source: Manage Submissions (Process)

Dest: Outside Viewers (Source/Sink)

Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

Website-Selection Data Flow

Description:

Outside viewers want to view the website

Location:

Context Diagram (CONTEXT)

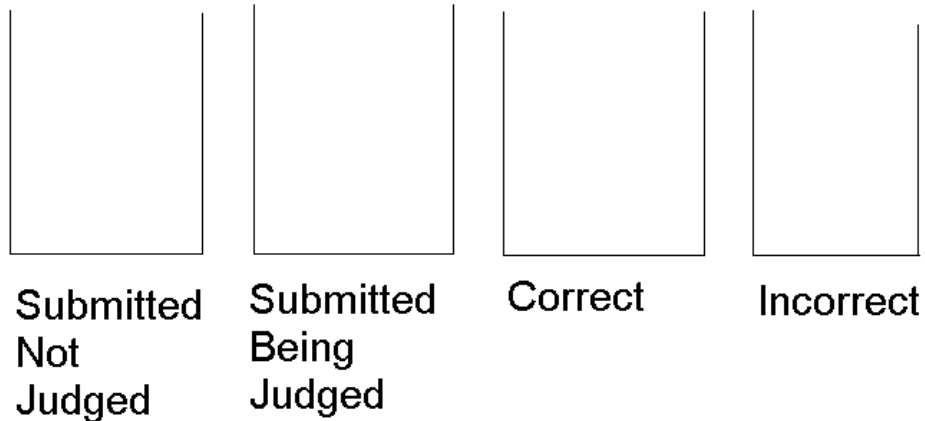
Source: Outside Viewers (Source/Sink)

Dest: Manage Submissions (Process)

Date Last Altered: 11/30/2004 *Date Created:* 11/30/2004

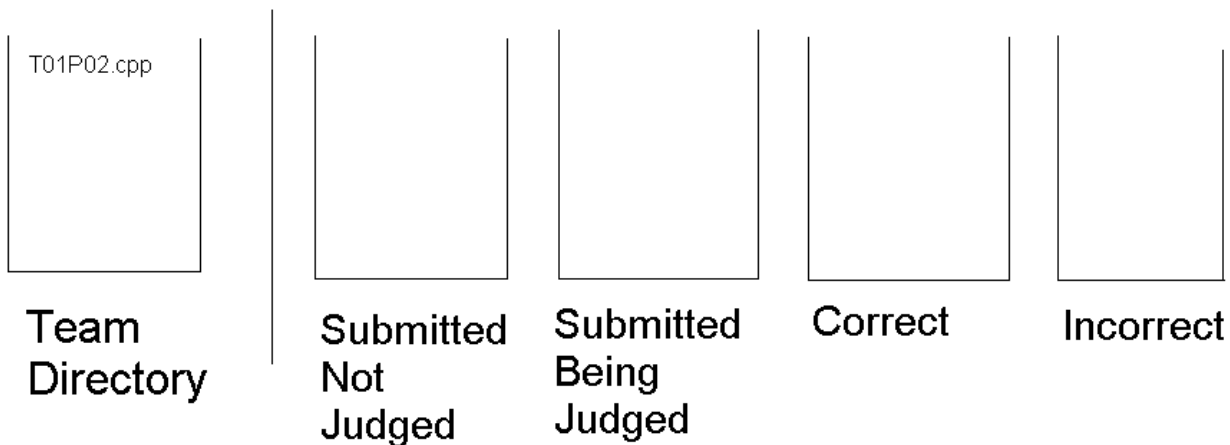
Section 1.4 Logical Data Stores

All of the data stores that will be used for the Programming Contest Submission and Scoreboard will be housed on the Turing server for the Siena College Computer Science Department, administered by Mr. Kenneth Swarner.



Submission Data Stores – There will be four directories on Turing to deal with the submitting of a solution:

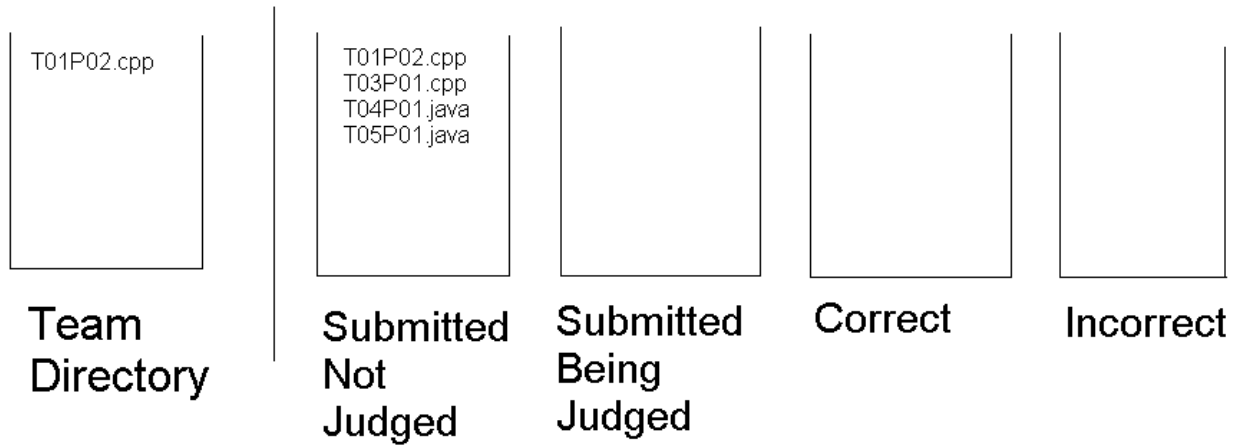
- 1) “Submitted Not Judged” – solutions submitted but not judged
- 2) “Submitted Being Judged” – solutions submitted and being judged
- 3) “Correct” – Solutions Correct
- 4) “Incorrect” – Solutions Incorrect



Team Directory:

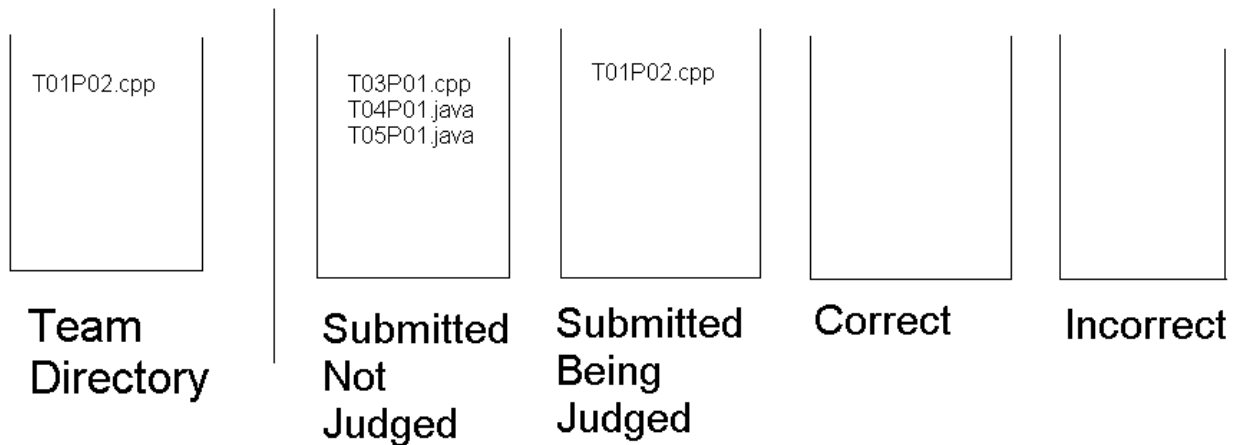
A team will save their solutions in a directory on their computer that can be pulled by the solution web page to allow the solution to be submitted to the judges.

Team Submission:



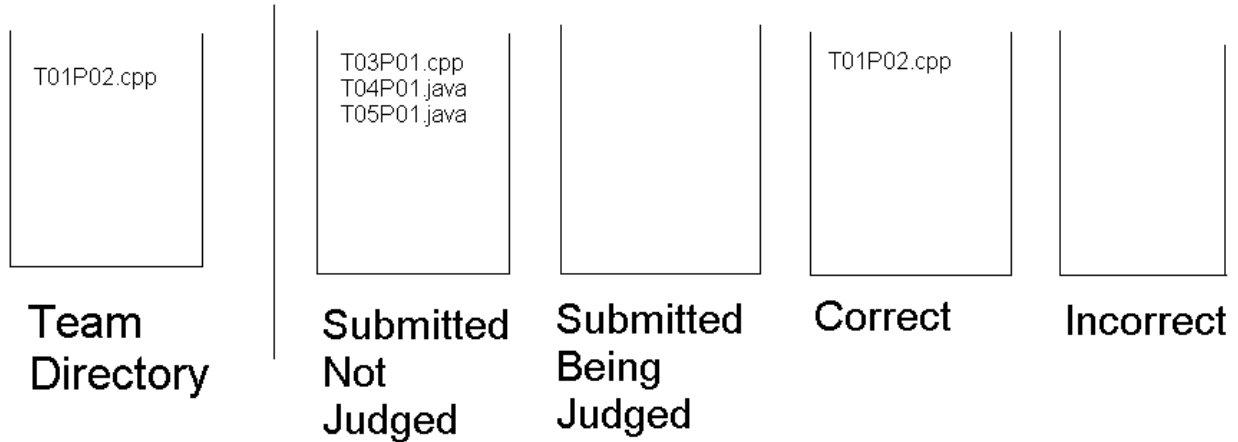
When a team submits their solutions to the problems given, a copy of the solution will be made from the team’s computer to the data store “Submitted Not Judged.” While in this directory, every judge will be able to see that is it on his or her web site in the queue that is displayed. This will also make the team see “Submitted Not Judged” on the status bar for that specific problem.

Judge Selection:



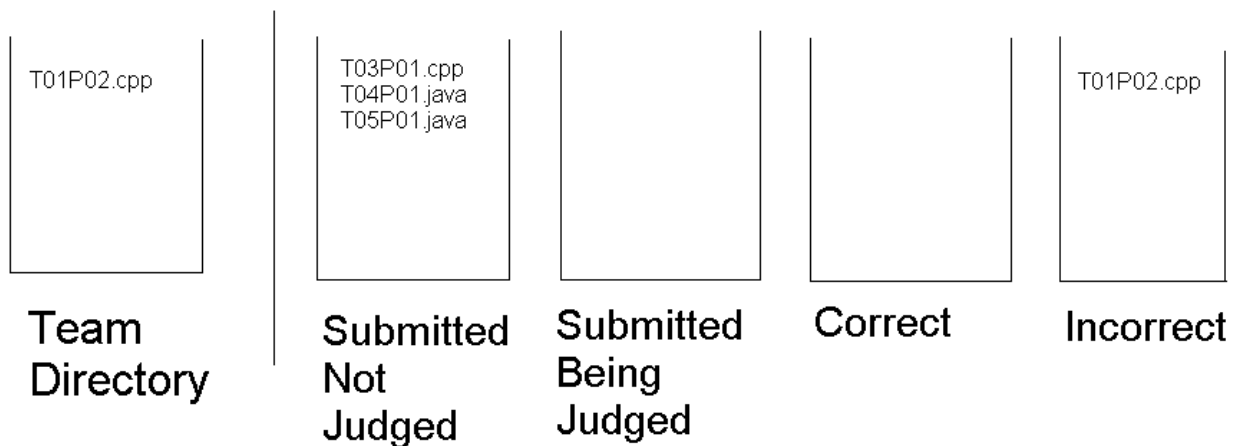
Once a judge selects a solution to judge, it will be moved from “Submitted Not Judged” to “Submitted Being Judged.” This will make sure that only one judge will choose a solution to grade. When a solution is in this directory, a team will see “Submitted Being Judged” in the status bar for that specific problem.

Correct Submission:



Once a judge completes the judging of the solution, if it is correct and a judge selects that as a response to the team, it will be moved from the “Submitted Being Judged” directory to the “Correct” directory. A team will see “Correct” in the status bar for the specific problem and know that they do not have to do anymore work on this problem.

Incorrect Submission:



If a file is incorrect, a judge will select the appropriate response to a team, and when submitted, the solution will be placed into the “Incorrect” directory. The reason for doing the submission like this takes care of the problem of teams in the past not being able to resubmit a solution, and judges judging the same solution.

Questions Submitted

The Questions Submitted directory will hold all the text files of questions to problems submitted by the specific teams.

```
T01P01.bt  
T01P02.bt  
T03P01.bt  
T04P01.bt  
T06P05.bt
```

Questions Submitted

All the judges will be able to see all the questions in this directory on their queue displayed on their website.

```
T01P01.bt  
T01P02.bt  
  
T04P01.bt  
T06P05.bt
```

Questions Submitted

When a judge selects to answer a question and select it from the queue, it will be removed from the “Questions Submitted” directory, to make sure only one judge answers each question.

Scoreboard Directory:

	A	B	C	D	E	F	G	H	I	J	K	
1						Problems						
2			1	2	3	4	5	6	7	Correct	Time	
3		1										
4	T	2										
5	E	3										
6	A	4										
7	M	5										
8	S	6										
9		7										
10		8										
11		9										
12		10										

There will be a two dimensional array (matrix), $10 \times T$ where T = number of teams in the contest, to allow the ease of displaying the scoreboard. Each row in the array will represent a different team and each column will represent a different problem. The scoreboard will display all the data placed into the array, which will be the times a team finishes a respective problem. Once this is updated, it will be reflected on the scoreboard as well.

Previous Problems Text Files:

In order to allow outside users to view the problems from previous years, we must make text files of the old problems to be able to be opened from the problem web site. These text files will be stored in the same place where the website pages are stored.

Previous Scoreboard Web Pages:

In order to allow outside users to view the final scoreboards from previous years, we make available links that will take the viewers directly to other web pages that contain the old scoreboards. These web pages will be stored in the same place where the Contest website pages are stored.

Section 2: Testing Requirements

In order to test the GUI's for the Programming Contest Submission and the Scoreboard we must verify each GUI individually to ensure perfection.

Section 2.1: Team GUI Testing

Test to ensure that every entity in the team GUI works as expected, starting from the status bars showing the correct status to when a team chooses to view the scoreboard.

Course of action	Expected Result	Pass/Fail	Comments
Check status bars	Current file location is shown	P F	
Select radio button	Only one can be selected	P F	
Click on submit button	One of the radio buttons must be selected	P F	
To submit a solution: 1. A language must be selected. 2. Click on "Submit"	1. The language section is displayed. 2. Solution is sent to the Judges panel and the page is refreshed	P F	
If "Submit" is clicked without selecting a language	Error: You must select a language for your solution	P F	
Select a question	The question box is displayed	P F	
"Submit" is clicked without typing a question	Error: You must type a question to submit	P F	
Submit a question	1. Ensure that a question is typed 2. Ensure the question is sent to the message board and the team homepage is refreshed	P F	
Click on scoreboard	1. The scoreboard is displayed in a new browser with teams in ranked order. 2. Ensure that the order is correct	P F	
Click on Dropdown box	Must allow you to choose a problem to view clarifications on in the message board	P F	
Choose a problem from drop-down box	All clarifications for the specified problem are shown in the message boards	P F	

Section 2.2: Judges GUI Testing

Test to ensure that every entity in the judge GUI works as expected, starting from viewing items in the queues to sending clarification answers to correct message board.

Course of action	Expected Result	Pass/Fail	Comments
Check file queues	Solution and question queues must show current solutions/questions to be processed.	P F	
To Judge a solution: 1. Select solution from queue 2. Click “judge solution” 3. A response is selected	- Team name and problem number are displayed - Response section is displayed	P F	
A response to a solution (Correct/Incorrect) is selected	-Only one radio button can be selected at a time.	P F	
Click “Submit”	The selected response is sent to the team and the page is refreshed to the judges’ homepage.	P F	
To Clarify a question: 1. Select question from the queue and click “Clarify question”	1. A new section is displayed with 2 text boxes: one with the question and the other one to answer the asked question.	P F	
Type your answer in the lower text box	Nothing is expected to happen	P F	
Click “Submit to Team”	Answer is sent to team that asked the question and the judge page is refreshed to the judges’ homepage	P F	
Click “Submit to Board”	Answer is sent to the message board for everyone to see it and the page is refreshed to the judges’ homepage	P F	
If a question is selected and the judge clicks on “Judge Solution”	Error: you must click on the “Clarify Question” button	P F	
If a solution is selected and the judge clicks on “Clarify Question”	Error: you must click on the “Judge solution” button	P F	
The judge clicks on “Submit” without selecting a response	Error: You must select a response before submit	P F	

Click on scoreboard	1. The scoreboard is displayed in a new browser with teams in ranked order. 2.Ensure that the order is correct	P	F	
---------------------	---	---	---	--

Section 2.3:Scoreboard Testing

Test to make sure that the scoreboard is viewable and the most importantly that the information in there is correct and accurate, starting from displaying the information in a two-dimensional array to ranking the teams in the correct standing order.

Course of action	Expected Result	Pass/Fail	Comments
Display Scoreboard	1. The information is viewable and is in a two-dimensional array (matrix)	P F	
Scoring	Correct calculation	P F	
Timing	Correct calculation of timing	P F	
Ranking	Correct ranking based on timing and scoring	P F	
Updates	The scoreboard updates constantly and continues to rank teams accordingly.	P F	

Section 2.4:Programing Contest Website Testing

Procedure	Expected Result	Pass/Fail	Comments
Viewing the main page and any sub pages of the contest.	Any and all pages must be able to be viewed from a variety of operating systems, browsers, and resolutions.	P F	
Navigating links	All links are in working order (including email links).	P F	
Contest Home	Refresh the Homepage	P F	
Scoreboard	Taken to correct page in a separate browser window.	P F	
Past problems	Taken to correct year problems (in PDF format)	P F	
Home	Taken to college homepage	P F	
Search	Taken to a Google search page.	P F	
Adobe Acrobat	Taken to Adobe Acrobat download page	P F	
E-mail (SienaSEG...)	Open the e-mail page	P F	
Disclaimer	Open Siena College Web Disclaimers	P F	

Section 3: Sources Of Information

The information for this section was obtained from meetings with our clients, Mr. James Matthews and Dr. Scott Vandenberg. Other sources of information include Dr. Lederman's class lectures, the Software Engineering class textbook *Software Engineering: A Practitioner's Approach* by Roger S. Pressman and previous Software Engineering teams' projects, located at <http://www.cs.siena.edu/%7Elederman/csis410/csis410.html>.

Section 4: Glossary of Terms

Computer Science Programming Contest – A programming contest administered by the Computer Science Department for local high school teams to come to Siena and compete.

DFD – Data Flow Diagram – A graphical representation that depicts information flow and the transformations that occur as data moves from input to output.

Directories – Folders on Turing in which files will be stored, as well as being moved from and to them.

DreamWeaver – A program that will be used to develop all needed websites.

Gantt Chart - A chart that depicts progress in relation to time, often used in planning and tracking a project.

GUI – Graphical User Interface – The screens that users will see while using the Programming Contest Submission Software.

HTML - A markup language used to structure text and multimedia documents and to set up hypertext links between documents, used extensively on the World Wide Web.

Internet - An interconnected system of networks that connects computers around the world via the TCP/IP protocol.

Java- Programming language that our program will possibly be built in.

Linear Sequential Model / Classic Waterfall Model – A systematic, sequential approach to software development that begins at the system level and progresses through analysis, design, coding, testing, and support.

Scoreboard – A web-based list of teams, in ranked order, based on the number of problems each team has answered correctly, and the time used to answer the questions.

Turing – The Unix Server that every PC in the Computer Science Department Connects to. It is under the administration of Mr. Ken Swarner.

VB- Visual Basic - Programming language that our program will possibly be built in.

Web-based – A software that uses the World Wide Web on the Internet as a user interface

Team ranking – Teams in the contest are placed in an order based on the number of correct solutions and the about of time taken to submit those solutions.

Array - An arrangement of memory elements in one or more planes.

Section 5: Gantt Chart

