

University of Scranton
ACM Student Chapter
Department of Computing Sciences
19th Annual (2009) High School Programming Contest

Date: Monday, April 6, 2009

Place: The Andrew W. Plonsky Software Engineering Lab (room 488) in the Harper-McGinnis wing of St. Thomas Hall at the University of Scranton.

Schedule:

Arrival and Sign In	9:15am– 9:45am
Orientation/Practice	9:15am–11:00am
Lunch (food provided)	11:00am–11:45am
Return to Plonsky Lab	11:45am–11:55am
Pre-contest Instruction	11:55am–12 noon
Contest	12 noon–4:00pm
Awards Banquet	4:00pm–5:15pm

Contestants are expected to arrive on the 4th floor of the Harper-McGinnis wing of St. Thomas Hall between 9:15am and 9:45am, at which time they can sign in. Upon signing in, each team will be issued a login ID and assigned to one of the PC's in the Plonsky Lab. A team may have up to three members, all of whom must be students at the school represented by the team.

Contestants may use the next 90 minutes or so (until the 11am lunch break) attempting to solve two practice problems. This will give them the chance to become familiar with

1. the computing environment (Microsoft XP, Unix)
2. programming language compiler(s)/interpreter(s) they intend to use,
3. text editor(s) they intend to use, and
4. procedures for submitting programs and queries to the judges, and for receiving the judges' responses.

U of S student volunteers will be present to provide assistance during this time, as well as during the contest.

Beginning at 11:00am, lunch will be held on the fifth floor of Brennan Hall, which is about a five minute walk from the Plonsky Lab.

Contestants are to return to the Plonsky Lab by 11:55am for pre-contest instructions and distribution of contest problems. The contest begins at 12 noon and ends at 4:00pm. At the conclusion of the contest, contestants and coaches can make their way back to Brennan Hall for the awards banquet. Scholarships of \$500 (towards tuition at the U of S) will be awarded to the members of the winning team, and the top three teams will be presented with plaques.

Registration:

At www.cs.uofs.edu/~mccloske/hs_prog_contest/ you will find a hyperlink to an online registration form. An authorized school representative may use the form to register up to two teams. (If you prefer not to register online, you can print the form, fill it out by hand, and send it via the U.S. Postal Service to Robert McCloskey, Dept. of Computing Sciences, University of Scranton, Scranton PA 18510-4664.) The registration fee of \$40 per team covers everything, including lunch and dinner for the team members and coach.

We would like for every team that registers to participate, but space limitations may preclude this. Therefore, we have established the following priority scheme, which is intended to accommodate teams from the greatest possible number of schools: The earlier the date on which all its registration materials (i.e., registration form and payment) have been received, the higher the priority assigned to a school. Going down the list of schools in order of priority, we invite one team from each school until either the maximum number of teams is reached or there are no more schools. In the latter case, we go back to the top of the list and invite one more team from each school until either the maximum number of teams is reached or there are no more schools.

Shortly after the March 30 registration deadline, the contact person from each school will be notified via e-mail as to how many teams from her/his school we can accommodate. We will return the registration fee of any team whom we could not invite due to a lack of space.

Computing Environment:

Operating System: Each team will be assigned to one of the PC's in the Computing Sciences Department's A.W. Plonsky Lab in room 488 of St. Thomas Hall. The machines in this lab will be running the **Microsoft XP** operating system (or accessing a server that makes it appear so). Teams programming in languages other than Java will use a telnet client to connect to one of the CS dept.'s servers running Unix (specifically, FreeBSD 6.1). There, they will have access to a Python interpreter and to compilers for C/C++ and Pascal.

Programming Languages: Contestants may write programs in Java, C, C++, Pascal, or Python. (On the registration form, please be sure to mark all the languages that your team(s) may wish to use.) (If your students would like to use some language not on this list, please inform us; we might be able to accommodate you.) Specifically, they will use Java SE 6 (i.e., 1.6), the GNU C/C++ compiler (version 3.4.4 under FreeBSD), Free Pascal (version 1.0.10) (see www.freepascal.org), and Python (version 2.4.2).

Input/Output: All contest problems will call for input to be obtained from "standard input" and output to be written to "standard output". Instructions for "redirecting" standard input

and standard output to files will be supplied, which will make it easy to do program testing using data files.

Text Editing: Windows XP has several application programs that can serve as text editors, including (in increasing order of sophistication/overkill) Notepad, Wordpad, and Word. Java programmers are encouraged to use jGrasp, which is an “integrated development environment” for Java. Because jGrasp has a nice editor, it can serve in that limited capacity even for other languages.

On the Unix side, available text editors include **vi** and **pico**.

Printing: There is a printer in the lab that will be available for use by contestants.

Reference Material: Each team may bring (a reasonable amount of) reference material (books, notes, source code listings, etc.) so long as none of it is in computer-readable form. Removable storage devices (e.g., USB flash drives, CD’s, DVD’s, etc.) are not allowed. Reference material is not to be shared with other teams.

Contest Procedures:

Overview: The competition is based on a set of programming problems. Each problem is a specification of a computer program (i.e., a description of a relationship between inputs and outputs) that can be solved by developing a program that behaves in a manner consistent with the specification. Each team’s objective is to solve as many problems as possible, as quickly as possible.

Program Submission: Instructions describing how contestants are to submit a program for judging will be provided before the contest. Submissions will be carried out electronically using **PCWSA** (Programming Contest Web Submission Application), which was developed by two University of Scranton students.

Judging: Under normal conditions, the judges’ evaluation of a program will be delivered to the team (electronically) within several minutes of its submission. The judges’ evaluation will indicate either that the submitted program was found to be correct or that it was found to be in error. In the latter case, some indication will be given as to what kind of error was detected.

Prior to the contest, the judges will develop a set of test data for each contest problem. To evaluate a submitted program, the judges will apply the program to the pertinent test data. (Thus, all programs submitted as potential solutions to a particular problem will be applied to the same test data.) If the program produces correct output, it will be judged to be correct. Otherwise, the judges will indicate on their evaluation which kind of error occurred. (If more than one error occurred, they will indicate the kind of error that seems to be the most serious or that seems to best characterize the program’s behavior.)

Queries: If the members of a team do not fully understand a contest problem, they may submit (via PCWSA) to the judges a **query** asking for clarification. A query is for the purpose of asking a specific question about how to interpret a contest problem. A query should not ask for a problem to be reworded in its entirety, nor should it ask for advice on how to attack a problem or for confirmation that a particular approach to attacking a problem is sound. Nor should a query ask for assistance in making use of an operating system utility, or a text editor, or a compiler, etc. Volunteers will be on hand for providing such assistance.

Normally, the judges will post a query, together with their response, to the **query bulletin board** (which is accessible to all contestants via PCWSA) within several minutes of its receipt.

Prior to submitting a query, team members should examine the query bulletin board in order to ensure that their question was not previously posed and answered.

Any query that is deemed by the judges to be “out of bounds” (e.g., because it was meant as a joke or it asks for advice on how to solve a problem) will not be posted. The team that submitted the query will be notified that its query will not be answered.

Assistance from Coaches: Coaches may assist their teams during the orientation/practice session prior to the contest, but they are not to communicate with any contestants during the contest, unless some unusual circumstance arises.

Team Rankings: Teams will be ranked according to the number of problems solved. If two teams solve the same number of problems, they will be ranked according to how quickly they solved those problems. More precisely, the time used in solving a problem is defined to be the number of minutes from the start of the contest until the submission of the solution, plus a penalty of twenty minutes for each submission of an “incorrect solution” for that problem. The sum of these times is used as the relevant measure.

For example, suppose that each of two teams solve three problems, with the first team using 75, 142, and 260 minutes, respectively, in solving theirs (including penalties assessed) and with the second team using 95, 150, and 200 minutes, respectively, in solving theirs. The second team will be ranked ahead of the first, because its total time was 445 minutes, compared to 477 minutes for the first team.

Awards Banquet

Following the contest, there will be an awards banquet on the 5th floor of Brennan Hall. At the conclusion of dinner, plaques will be awarded to the 1st, 2nd, and 3rd place teams. In addition, each member of the winning team will receive a \$500 scholarship to the University.