

University of Scranton
ACM Student Chapter
Department of Computing Sciences
27th Annual (2017) High School Programming Contest

Date: Friday, April 21, 2017

Place: Loyola Science Center 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 Computer Lab	11:45am–11:55am
Pre-contest Instruction	11:55am–12 noon
Contest	12 noon–4:00pm
Awards Banquet	4:10pm–5:15pm

Contestants are expected to arrive at the 1st floor of the Loyola Science Center (corner of Monroe Ave. and Ridge Row) between 9:15am and 9:45am, at which time they will be issued a login ID and assigned to a workstation in one of the Computing Sciences Department's labs. A team may have up to three members, each of whom must be a student 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 Windows user interface)
2. the jGrasp integrated development environment, through which one creates and executes programs.
3. procedures for submitting programs and queries to the judges, and for receiving the judges' responses using the PCWSA programming contest management software

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 in Brennan Hall 509 (the Rose Room), which is about a three-minute walk from the Loyola Science Center. (Brennan Hall is labeled 16 on the campus map and is about 200 yards north of the LSC.) Contestants are to return to their assigned workstations 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 509 for the awards banquet. Scholarships of \$500 (towards tuition at the U of S for entering as a full-time first-year student) will be awarded to the members of the winning team, and the top three teams will be presented with plaques.

Registration:

In the months preceding the contest, you will find a link to an online registration form at www.cs.uofs.edu/~mccloske/hs_prog_contest/. An authorized school representative may use the form to register up to three teams. The registration fee of \$50 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 repeat the above using the list of schools that registered at least two teams. If, afterwards, there is still room for more teams, we repeat the above using the list of schools that registered three teams.

Shortly after the 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 a workstation in one of the Computing Sciences Department's labs in the Loyola Science Center (either LSC 182, 183, 164, or 165). The workstation will connect to a Windows Server that presents a user interface similar to that of the **Microsoft XP** operating system. Teams are expected to use jGrasp for editing, compiling, and running their programs.

Programming Languages: Contestants may write programs in Java, C, C++, 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.)

Input/Output: All contest problems will call for input to be obtained from "standard input" (or from a file with a specified name) and for output to be written to "standard output" (or to a file with a specified name).

Text Editing: It is recommended that contestants use jGrasp's text editing features, both for developing source code and for creating files containing input data for testing their programs. However, Notepad and Wordpad will be available, too.

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 to be used, nor are cell phones. 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 desired 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 a **query** (via the "Request Clarification" feature in PCWSA) to the judges in order to ask for a clarification. A query is for the purpose of asking a specific question about how to interpret a contest problem. A query is not for the purpose of asking for advice on how to solve a problem or for confirmation that a particular approach to solving a problem is sound. Nor should a query ask for assistance in making use of jGrasp, an operating system utility, or PCWSA. U of Scranton student 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** on PCWSA within several minutes of its receipt. (In PCWSA, click on the "View Clarifications" link.)

Prior to submitting a query, team members should examine the query bulletin board, as their question may have been posed and answered already.

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. However, the judges will notify the team who submitted the query to let them know that no substantive answer will be forthcoming.

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 in the Rose Room of Brennan Hall (509). 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.¹

¹This small scholarship can be used only by a student who enrolls as a full-time first-year student.