# IEEE SoutheastCon 2023 Software Competition Rules

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## Introduction

The IEEE SoutheastCon 2023 software competition will challenge teams of up to 3 students to exercise problem-solving abilities and programming skills to solve a set of given problems in four hours. The competition will be held during IEEE SoutheastCon 2023 in Orlando, Florida on 14 April 2023.

## Registration

The software competition registration deadline is March 20, 2023.  Late entries may be rejected based on availability.

Competitors must also register for IEEE SoutheastCon 2023 at https://ieeesoutheastcon.org/registration/.

## Language

The language of the competition is English. Therefore, all written contest materials will be in English.

## Team Composition

Each team may have up to 3 contestants eligible to compete in the Software contest. The team's contestants must be enrolled in an undergraduate degree program  and be an active member with an IEEE student branch. An IEEE student branch/post-secondary institution shall only send 1 team of up to 3 members to participate in the competition.  All team members must be a current member or student member of IEEE.

## Competition Computing Environment

Teams are allowed to bring one laptop with C, C++, Java, or Python installed. Judges will use C/C++ based on Version 17 Standards, GNU gcc Compiler 11.2 or greater, Java Version 8, and Python Version 3.7. Teams shall ensure their source code compiles and runs on these compilers. Teams are allowed to have one or more of the programing language environments installed. Teams have the option of solving different problems in different languages. Only one laptop per team is allowed during the competition. A second laptop may be brought as a backup and must remain powered off until the judges determine it may be used to replace the original machine. All laptops must have one USB port available and remain disconnected from any network (Internet, FTP, etc.) during the contest.

## Competition Problems

The competition consists of four to eight programming problems of varying complexity. The team should strive to solve as many problems as possible as quickly as possible. The solution to the problems will avoid dependence on any particular computing environment. In the case of multiple problems, the problems are independent and may be solved in any order.

1. The maximum execution time for each problem will be provided with the problem specification. Submissions exceeding the maximum execution time will receive a 0 score.
2. Teams will be allotted 4 hours to work on the solutions.
3. Only 1 team submission per problem will be allowed.

4. Correctness of a solution will be based on the program producing the correct output for a set of inputs.
5. Teams will be given examples of inputs and outputs. All problems will include some recommended sample data, but additional test data will be used during judging.
6. Input will be received from the standard input stream (e.g., keyboard), and output will be sent to the standard output (e.g., terminal window).

# Competition Conduct

1. Advisors and guests will not contact their teams during the contest. The penalty for contact is immediate disqualification of the teams.
2. The contest officials may disqualify a team for any activity that jeopardizes the contest, such as accessing the Internet, dislodging extension cords, unauthorized modification of contest materials, or distracting behavior.
3. Neither electronic media nor electronic devices (calculators, cell phones, pads, etc.) may be brought into the contest area. However, contestants may bring books and notebooks (no loose paper, please) for use during the competition.
4. Staff will be available during the competition to answer questions.

## Reference Materials

1. Absolutely no internet access will be allowed during the contest, either from the team's competition laptop or from any other devices. The venue will not provide wi-fi/internet to download files at the last minute before the contest starts.
2. Teams may pre-load reference materials onto their competition laptop, including language reference documents, IDE (interactive development environment) language support packs, and sample source code. Be cautious of IDE features or reference software which require internet access in order to function.
3. Teams may also bring and use any reference materials which are non-electronic and non-machine-readable, such as books, printouts of language documentation, and printouts of source code.
4. As every member of every team is responsible to know and follow the rules, it is highly recommended that each team should pre-load their laptop with these rules (along with any other information provided about the software competition) and/or bring printouts of the same, for their reference during the contest. No printouts or electronic versions of the rules will be provided by the contest staff at the event.
5. If a team elects to bring a second laptop as a backup, it should be prepared with all the same software, references, and tools that are on the first.

## Communication, Clarifications, and Issues during the Contest

1. During the contest, team members are permitted to communicate only with their team members and the contest staff. Communication, by any means, with other teams or anyone other than contest staff is prohibited.
2. During the contest, if a team has a file to print, a procedural issue, an accessibility issue, a health issue, or a technical issue (such as loss of power, disk crash, etc.) they should get the attention of the contest staff immediately, to get assistance or remediation of the issue.

3. If a team requires clarification to one of the posed problems, they must write their request for clarification on a provided form and give it to a contest staff member to be answered.
   a. The contest staff will accept the clarification request, but cannot guarantee to answer in any timeframe, or at all. If the clarification request itself is unclear, it will not be answered. If the clarification request is asking for a hint, asking for algorithm information, or asking for programming language details, it will not be answered.
   b. If the contest officials agree that there is ambiguity in the problem specification, they will formulate a concise answer and provide that same answer to all teams as soon as possible. If the answer is provided as a verbal announcement, this is not an invitation to a verbal discussion; additional clarification requests must be written.

## Printing

1. During the contest, a team may find it useful to print source code or input/output data for offline development and debugging by one team member while another team member works on a different problem directly on the laptop. The contest will provide a print station with printer and paper, for this purpose alone.
2. Printing facilities will be available only during the contest and are to be used only for plain text files (such as source code) of a few pages, at most roughly a dozen pages. Other kinds of files, such as images, DOC, PDF, HTML documents, are not allowed to be printed using the contest print station.
3. Excessive use of the print facilities is prohibited. Excessive use will be determined in the sole discretion of the contest officials, on a case-by-case basis, according to the goals and purpose of the contest. For example, a team printing 12 pages every few minutes for over an hour could be deemed excessive, both because it is potentially disruptive to other teams who need to print, and because the team is unlikely to have created sufficient original work during the contest that justifies that much printing. Note that reference materials should be printed by the team in advance of the contest, using their own printer and paper.
4. Anticipated printing procedure (subject to change if contest officials deem necessary):
   a. To print a plain text file, insert the provided USB drive and delete everything on it.
   b. Copy the desired file to the root directory of the USB drive. There should be only one plain text file on the USB drive.
   c. Safely eject the USB drive and give it to the contest staff.
   d. The contest staff will collect the USB drive and, as soon as possible, return the USB drive along with your printout. There is no guarantee on the amount of time it will take to get your file printed.
   e. If there are multiple files on the USB drive, you may receive a printout of an unexpected file. If the file is not plain text, you may receive no printout at all. If the file is too large, you might receive a truncated version in the printout.

# Problem Submissions – File Naming and Submitting Code

1. For each problem your team attempts, you will submit only a single file containing only your source code. Do not submit executable files, project files, makefiles, test input or output files, README files, scripts, or installation packages. Do not provide a ".h" header file for C or C++ solutions.

2. The entire solution for each problem must be in a single, compilable source code file, with no external dependencies other than standard libraries for a supported language/compiler version.

3. The name of the source file must identify the problem and the language, using the following naming convention. Use the lowercase word "problem", followed by the problem number (in the fewest possible digits), followed by the dot ('.') with the language suffix. For Python 3, use ".py"; for C use ".c"; for C++ use ".cpp"; for Java use ".java". Examples: The source code for the C++ of the second of the posed problems should be named "problem2.cpp". The source code for the fourth posed problem solved in Python 3 should be "problem4.py".

4. The file name of a Java source code file must be consistent with the class name, therefore the source code for the third posed problem solved in Java should be "problem3.java" with a main class name of "problem3". The same source code file may contain additional classes, either as inner classes or after the main class. Additionally, all Java source code should be in the default package (i.e. no package statement in the code). Note that some programming environments will "helpfully" add a package statement for you, but this will result in your submitted code failing to compile outside of that environment.

5. Do not expect the contest staff to spend lots of time trying to figure out how to get your code to compile and run. For efficiency and fairness, your submissions may be evaluated by a partially automated process. Submitted code that follows all instructions should compile and run without issues.

6. Anticipated code submission procedure (subject to change if contest officials deem necessary):
   a. Insert the provided USB drive and delete everything on it.
   b. Copy the individual source files, using the required file names, to the root directory of the USB drive. For example, if your team has created solutions in Python 3 for the first and fourth problems, and a Java solution for the second problem, then the USB drive should contain only the source code files "problem1.py", "problem2.java", and "problem4.py".
   c. Safely eject the USB drive and give it to the contest staff.

## Competition Scoring

Solutions to problems submitted for judging are called runs. A problem is solved when the judges accept the submitted run for the problem. Each team may submit only one run submission per problem. At the end of the contest, each will be provided a single USB. Each team will save their source code for their programs on the judges' provided USB. Each team shall save, at most, one file per problem on the USB. The Judges are solely responsible for determining the correctness of submitted runs. In consultation with the judges, the contest officials will determine the winners. The contest officials and judges are empowered to adjust for or adjudicate unforeseen events and conditions. Their decisions are final.

Grading will be based on the number of correct solutions submitted by a team. Partial credit will be awarded for partially correct answers.

The output should follow the specification as closely as possible. Deviation in the output will cause the submission to be rejected.

Teams are ranked according to the total points scored. Each problem has a unique scoring value. The scoring values will be noted on each problem. The total number of possible awarded points for a

problem will be included in the problem statement. The score on the problem with the highest points will be used to break the ties in case of ties. If there is still a tie, the next highest points problem will be the tiebreaker, etc. The tying teams will be co-winners if the tiebreaker does not resolve a clear winner.

## Competition Judging

1.  A team of independent judges will score the run submissions and determine the top three winners.
2.  Judges can adjust for or adjudicate unforeseen events and conditions. Their decisions are final.
3.  Although they are unlikely, the Contest officials have the authority to resolve ties by examining the quality of submitted solutions and the number of incorrect submissions.
4.  The final contest results will be announced during the award ceremony.

## Protests, Appeals, and Remedies

If irregularities or misconduct are observed during the competition, team members should bring them to the attention of the competition officials and organizing committee so that action can be taken as soon as possible. The decision of the committee on all issues is final.

## Questions should be directed to:

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