ACM & WiCS Fall 2022 Programming Contest

Upper Division
November 5th, 2022

Do not open until contest starts
Instructions for Participants

• Contest URL: https://domjudge.cs.fsu.edu
• You have 5 hours to answer questions.
• You may submit solutions in the following languages:
  – C/C++
  – Python 3.9.2
  – Java 11
  – C# 7.0

• You are only allowed access to official language documentation and COP3014/COP3363 reference material. You are restricted to:
  – C/C++: http://www.cplusplus.com/reference/
  – Python 3.9.2: https://docs.python.org/3/
  – C# 7.0 https://docs.microsoft.com/en-us/dotnet/csharp/
  – COP3014/COP3363 Reference:
    * https://www.cs.fsu.edu/~vastola/cop3014/
    * https://www.cs.fsu.edu/~vastola/cop3363/
    * https://www.cs.fsu.edu/~jayarama/prog1.html

• You are also allowed one textbook or material no larger than 8.5” x 11” x 2” volume.
• No other resources (e.g. Stack Overflow, Google, Wikipedia) are permitted. Using non-permitted materials will lead to disqualification.
• Teams are restricted to using one workstation (computer) each.
• Use of a cell phone to circumvent these restrictions will lead to disqualification. Use of cell phones in contest rooms is not permitted.
• The Clarifications tab on Domjudge may be used to submit questions pertaining to each problem. Do not use this feature to request troubleshooting help.
• All input is redirected via STDIN.
• All output must be formatted to specification in terms of capitalization and spacing. Please refer to the example output for each question.
• Do not include a shebang in your submissions.
• Scoring:
  – Teams are ranked according to score. A higher score is rewarded by answering more questions while acquiring fewer penalties.
  – The team that solves the greatest number of questions in the quickest time wins.
  – Teams which solve the same number of problems are ranked by least total time.
  – Teams may resubmit solutions as many times as needed, but incorrect submission attempts will result in time penalties (and thus a lower score.)
  – The scoreboard may be accessed during the first four hours of the contest. The scoreboard will freeze during the final hour.

Question Writers:
• Luke Baker
• Marco Cognetta
• Supriya Palli
• Vic Rodhin
• Ben Zech
• Jack Skellington

A special thank you to all the question writers, proctors and volunteers for helping make this contest possible!
1 Creepy Corn Maze

Dr. Frankenstein is hosting a grand Halloween party this year with the exciting addition of simple corn mazes for the children.

There’s only one problem...he has lost the directions to the way out of each of the corn mazes! He is far too busy with party preparations, so he has asked you to create a program that will generate directions out of the corn maze for his monster to test.

Be careful though! If your directions are incorrect...Frankenstein’s monster will get lost and eat his way out of the corn maze, which would ruin it for the kids!

1.1 Input

Please note that all input read into the program is done via STDIN, (e.g. using cin statements in C++).

The first two lines will be integers, \( c \) and \( r \) representing the number of columns followed by the number of rows.

The next \( r \) lines of input will be the representation of the maze where ‘X’ (uppercase) marks corn and ‘.’ marks a spot on the path out of the maze.

There will only be one path out of the corn maze and the path will always have a width of 1. The path will only touch the top edge of the maze once where it starts, and the bottom edge of the maze once where it ends, so it will never touch the side walls.

1.2 Output

Domjudge will have sample Input and Output that you can download directly, so you do not need to manually type out the sample provided.

The first letter (uppercase) of the cardinal directions to get out the corn maze with each value separated by a single whitespace.

1.3 Sample Input/Output

<table>
<thead>
<tr>
<th>Sample Input 1</th>
<th>Sample output 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 6 XX.XXX XX..XX XXXX.XX X...XX X.XXXX X.XXXX</td>
<td>S E E S S W W S S</td>
</tr>
</tbody>
</table>