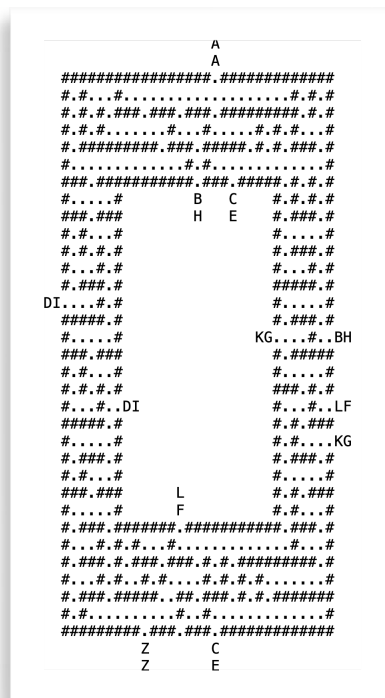


UC Merced SIAM Student Chapter Applied Math Challenge 2023

“Find the secret picnic spot for the Pooh bear and friends.”

The Pooh bear and his friends decided to go on a picnic in the magical Weenie forest park. They want to find the legendary secret spot to hang out during spring break, using the following mystery map the Pooh bear got from the sky.



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In the map, the (#) shows the trees or prohibited areas that nobody can go through, and the (.) is the passageway. The entrance of this forest park is at the (AA) position, and the secret picnic spot is located at the (ZZ).

Although a path to get the picnic spot can be found only with the passages (.), you can also use one or more magical portals: (BH), (CE), (DI), (KG), and (LF). When they hop on one of these portals, a single step can take them to another location with the same label portal.

Help the Pooh bear and friends to find a way to get to the secret spot for a perfect picnic!

Three of applied math faculties will judge your work based on your poster. You may include the followings **in your poster**:

- **What you Understand** the problem and brain-storm how to approach the puzzle
- **What computational tool you use**, such as MATLAB, Python, or C++
- **Explain** the process
 - how to import/sort the data
 - The algorithm or method to solve the puzzle (provide a pseudo code)
- **Visualize and verify** the solution you obtain
 - Show the path you found clearly
- **Discuss** what they learned while solving this puzzle

You must **submit your poster** file (.pptx) to eyoo3@ucmerced.edu by **Friday, April 7, 2023**.

WARNING

- Write the code from scratch. (**No copy & paste a code from online**)
 - If we found out this, you would no longer eligible to continue the applied math challenge.

Some advice

- Read the problem carefully and understand the problem before coding.
- Make a note or draw a graph on the paper to brainstorm
- Write an algorithm with an example.
 - Perhaps, make a simple example that mimics the actual puzzle.
- Remember that you do not have to use the magical portals to find a path.
- There are multiple ways to find the secret picnic spot!
 - Try to find as many as you can :D

Some useful methods:

- Breadth-First Search (BFS) method:

https://en.wikipedia.org/wiki/Breadth-first_search

<https://youtu.be/oDqjPvD54Ss>

<https://youtu.be/KiCBXu4P-2Y>

- Depth-First Search (DFS) method:

https://en.wikipedia.org/wiki/Depth-first_search

<https://youtu.be/7fujbpJOLB4>

This is a TEAM-work!

- Please respect your peers and learn from each other.
- Try to keep each other posted and communicate often.

This is Your work!

- Mentor CANNOT
 - Give you the solution (They also do not know how to solve this problem),
 - Give you a task to proceed this challenge.
- They may not be an expert on a particular programming language.
- You may prepare and organize your thoughts before you discuss with your mentor.

If you find this challenging that is great! It is supposed to be like that :D

If you feel something easy, try to go over your limit and find a new way to solve the problem!

Good Luck 🍀