

Report

① What type of graph would you use to model the problem input, and how would you construct this graph?

An adjacency list where vertices are stored with a list of connected neighbors. I used a struct to store other information like color, direction & weight associated with each vertex. A vertex has a list of the neighbor vertices it's connected to. This allows for both directed & undirected graph implementations. This implementation was chosen due to the ease (complexity-wise) of finding & accessing neighbors of a vertex.

② What algorithm will you use to solve the problem?

Be sure to identify how you will identify the sequence of moves Apollo must make in order to reach the goal

Algorithm:

Input: Maze text file

Output: Output text file

1. Extract information from maze & save rows, columns, direction, color
2. Set up adjacency list with vertices & all their connected neighbors using extracted info
3. Add all the vertices to the created graph & record weights of edges that connect vertices
4. Once graph is created, traverse it using BFS & record the parent of every node.
5. Use recorded parents to traverse backwards from goal to start vertex recording the direction & weights seen along the way
6. Reverse the path to get start to goal & output recorded weight + direction to a text file