GSoC 2019
JdeRobot C++ Challenge
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Labyrinth Problem:

As nothing has been given about the agent's entrance position, it has been assumed that the agent can only enter the labyrinth from the outer holes (boundary walls) of the labyrinth and not from the middle.

Ex 1:

Input Labyrinth:

```
# # . # # . # # #
# # . # . . # # #
# # # # . . # # #
# # . . . . # # #
# # . # # # # . #
# # # # # # # # #
. . . . . # # # #
```

As can be seen from here that there are multiple entrance on the boundary of the walls and hence the program will be executed and the below output will be obtained.

Output Labyrinth:

```
# # . # # 0 # # #
# # . # 2 1 # # #
# # # # 4 3 # # #
# # 8 7 6 5 # # #
# # 9 # # # # . #
# # # # # # # # #
. . . . . # # # #
```

Ex 2:

Input Labyrinth:

```
# # # # # # #
# # . # . . #
# # # # . . #
# # . . . . #
# # # # # # #
```

Output:
No path available for the agent to enter from outside
Only checking the boundary walls

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As it can be seen that there are no holes on the boundary, there is no way for the agent to enter the labyrinth and hence will prompt the user to input a different maze.

Results:
All the trial mazes and their output are included in the folder, the output maze and pathway is stored in a file named output_n.txt
Source code file is also included in the folder.

Libraries used:
- iostream
- vector
- queue
- stdio.h
- cstring

As nothing has been mentioned about the row and column size of the labyrinth, it has been assumed that it will not be given explicitly and hence dynamic container like vector is required to carry out this program. ROWS and COLS are calculated from the input file and then used in the entire program.

Instructions to run the code:

Cmake version > 3.1 required
Gcc > 4.8 required
C++ = c++11

Compiled using cmake

Go to the src directory and enter the below commands in the terminal:
cmake .
make
./output inputFile.txt outputFile.txt

Ex:
cd ~/JdeRobot_Cpp_Challenge/src
cmake .
make
./output maze_2.txt output_2.txt

The command line shows certain output like the input and output labyrinth and the maximum pathway length.