

# COP 290

## Assignment -2

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### Subtask -2

#### **Q. Problem-**

=Starting from starting point of the deadly Maze Tony Stark has to collect all these infinity stones and also he has to close all terminals at the edges of the Maze to prevent Thanos and its minions to enter the maze to kill Tony and to take infinity stones away from Tony in minimum time.

After collecting all those stones and closing all the terminals, Tony put them on the gauntlet and snap to destroy Thanos and its army. He needs to close all the terminals of the Maze because in our situation Tony's gauntlet takes some time for execution if it does not close Thanos or its Minions may enter the maze.

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#### **Idea—**

- 1) First we want to collect all these stones placed at different -different location of the Maze.
- 2) Also we have to close all opened terminals at the edges of the Maze to prevent Droid to enter the Maze.

-For this we can use DFS (Depth First Search) because-

- 1) Firstly we can travel all the places in the graph and if our stone is placed in some deep corner of the graph we collect it and travelling to the end of that path we get a terminal we will close it.
- 2) Secondly, if we do not get any stone following that path we can successfully close every open terminal in the graph.
- 3) We have to do this 2 process in minimum times before any minion or Thanos enters the maze.

4)And when number of the stones collected is 6 and all 5 terminals are closed (i.e in our case there are 5 terminals in the maze) then we can put it into our gauntlet and snap with sound “I am Iron man”. THE END.

## **Algoritms used here---**

1)Maze creation--

=a)<https://en.wikipedia.org/wiki/User:Dllu/Maze>

b)[https://en.wikipedia.org/wiki/Maze\\_generation\\_algorithm](https://en.wikipedia.org/wiki/Maze_generation_algorithm)

c)<https://www.makeschool.com/academy/track/standalone/trees-and-mazes/generating-a-maze-with-dfs>

d)[https://en.wikipedia.org/wiki/Maze-solving\\_algorithm](https://en.wikipedia.org/wiki/Maze-solving_algorithm)

2)Modified DFS (Depth First Search)---

=a)<https://www.geeksforgeeks.org/depth-first-search-or-dfs-for-a-graph/>

3) After Effects--

=a)<https://videofort.com/courses/after-effects-pac-man-part-1-board-creation/>

4)Visualization algoritm-

=a)<https://www.cs.usfca.edu/~galles/visualization/Algorithms.html>

## **Data Structure used--**

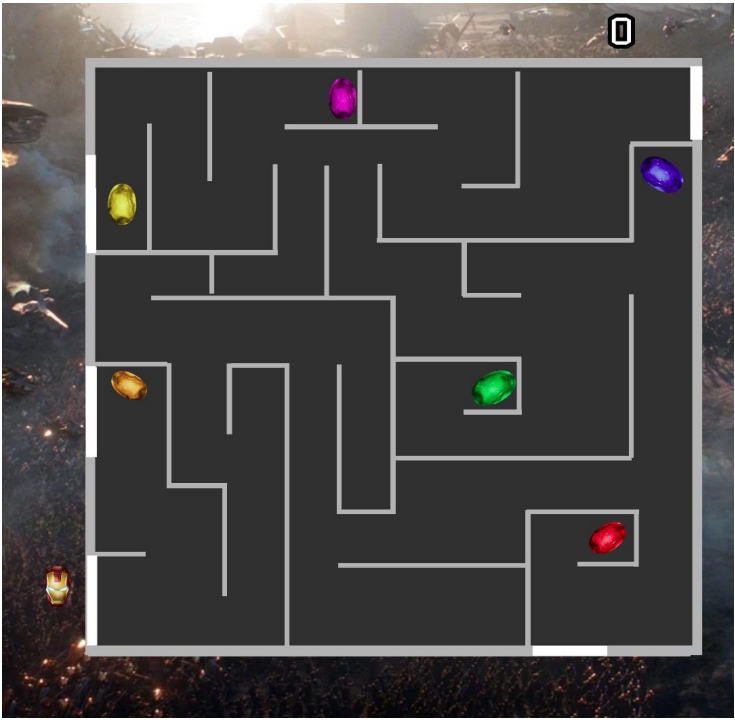
1)For our modified DFS we need array for maintained visited vertices in the graph.

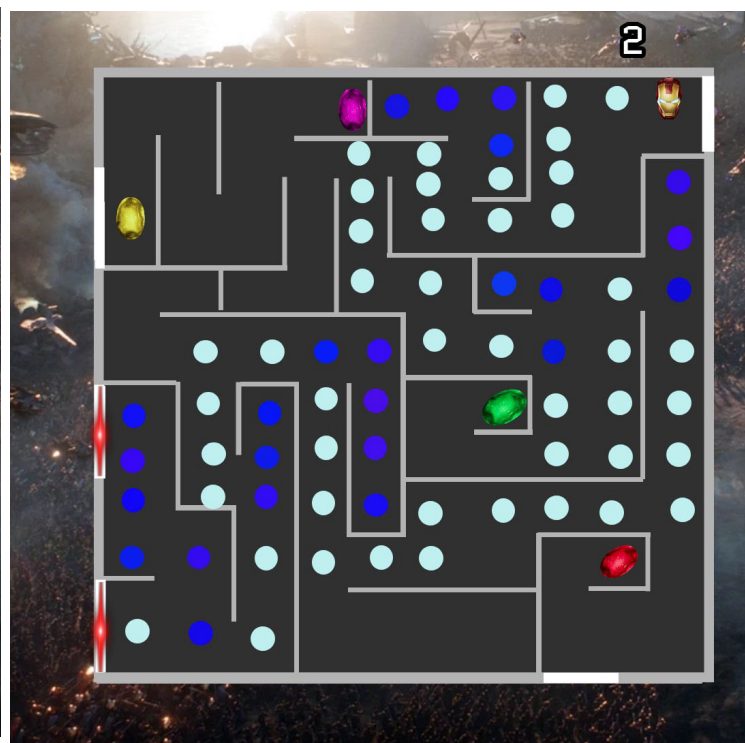
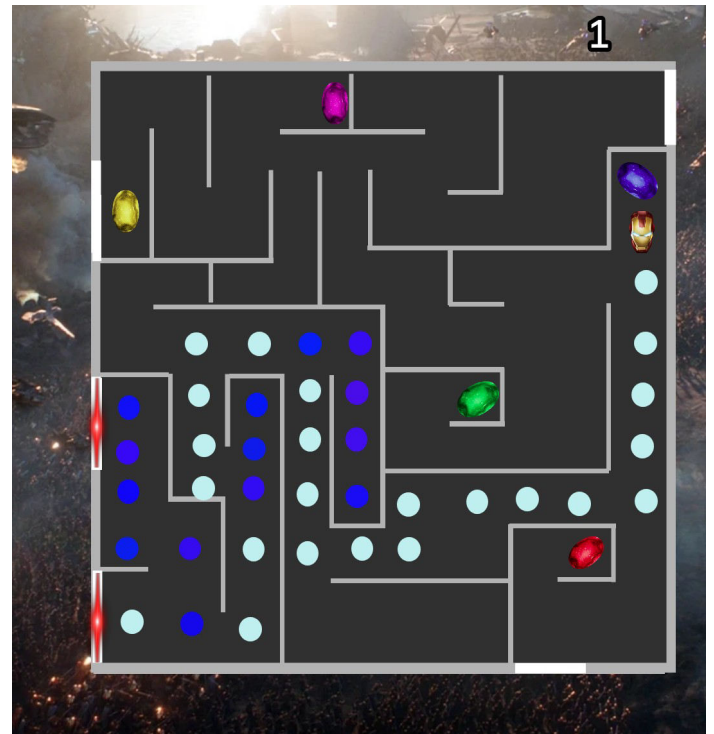
2) Binary tree for visualization and visual effect in the game.

## Simulation-

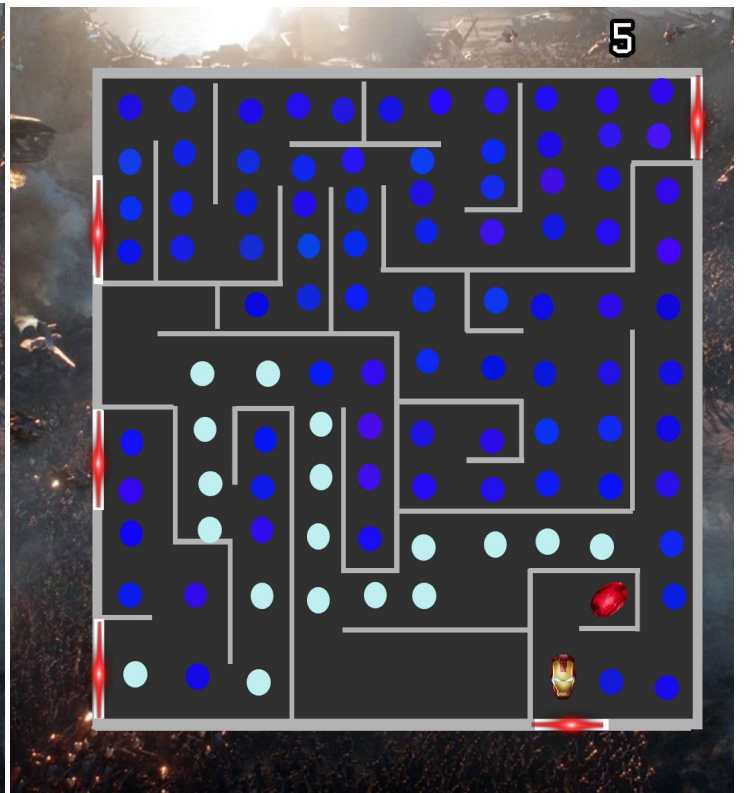
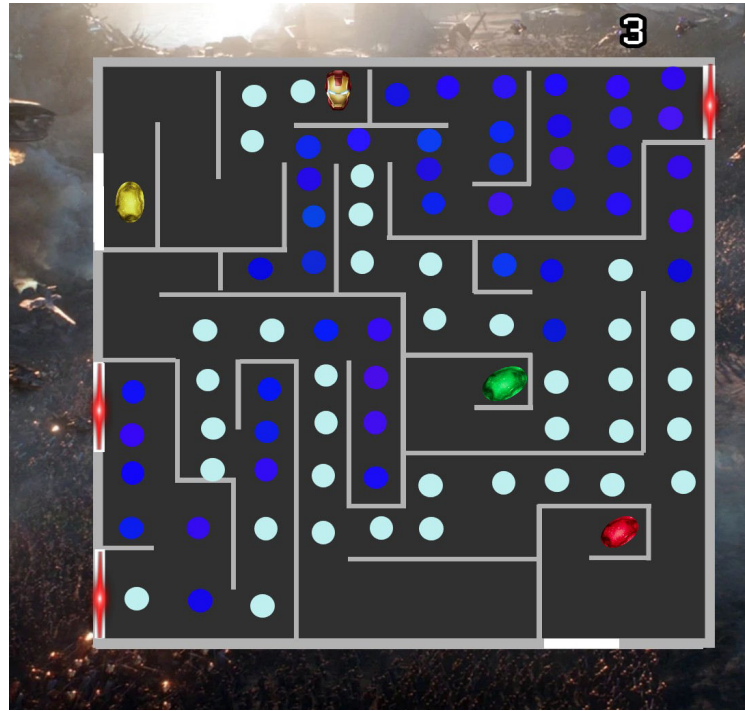
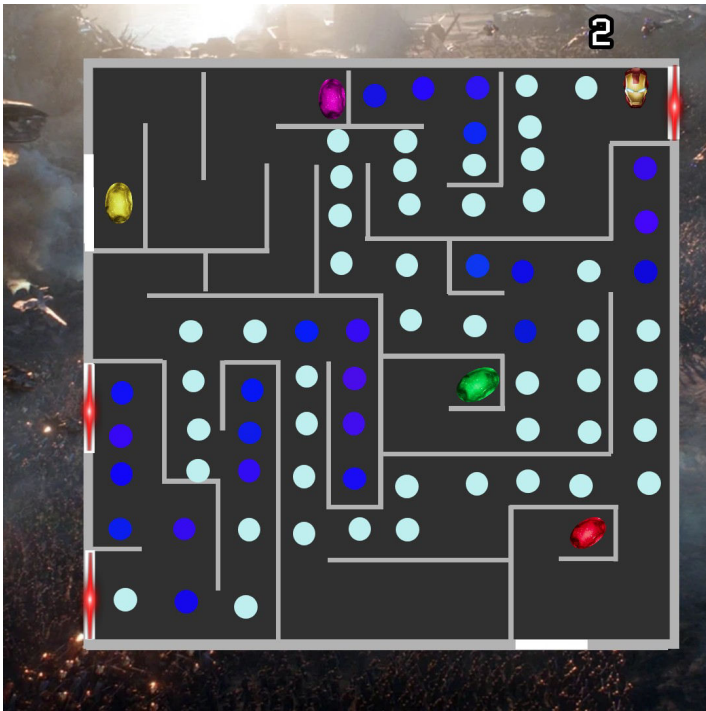
- a) Game starts with our tony standing at the Maze entry point and thanos's minions walking toward the Maze for collecting the maze through terminals gate at the edges of the Maze. In the background there will be the sound of minions creature walking and making noises.
- b) Tony travelling all the paths in the Maze to collect the stones and closing the terminal gate in the edges of the gate. Tony is travelling the maze with his suit so there should be sound of his suit when he is travelling.
- c) When he travels along a path this path turn into light blue path if travel that path only once and dark blue if travel that path more than one time.
- d) After each collecting of the stone by the tony we have a happy sound of energy entered the Tony and count increase by one and similarly in case of number of terminals we have closed (i.e here we need a closing sound of a gate).
- e) When all stones are collected and all door closed closed, after some seconds we will change our top view of Maze and our only focus is tony who is saying "I am Iron man" and then all minion and thanos vanishes with Avengers End Game Sound in the background.
- f) If this happen GAME OVER and YOU WIN otherwise YOU LOOSE.
- g) Each time location of stones and gate and the maze will be changed by our Maze creation algorithms.

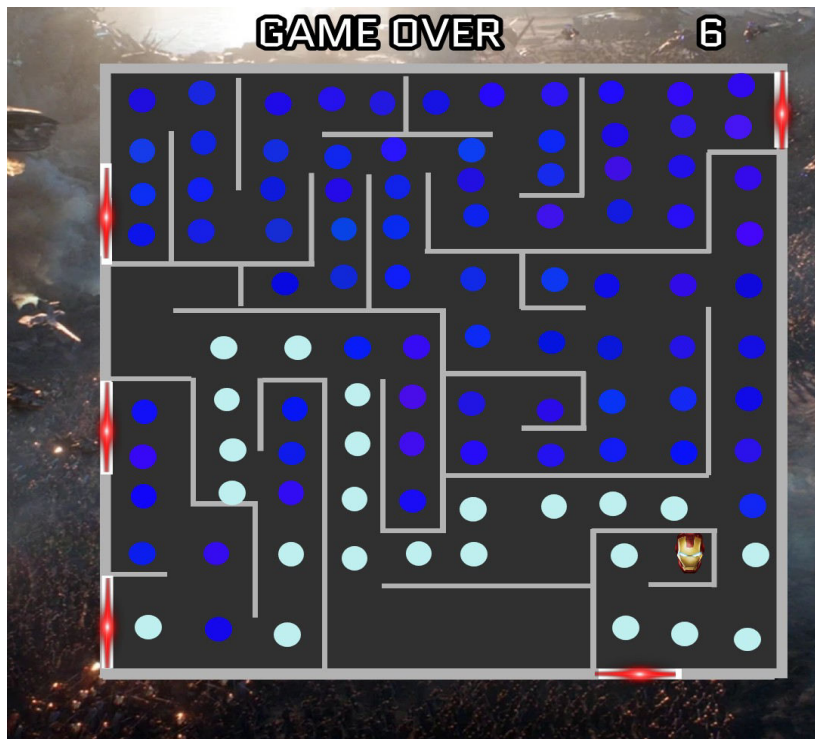
Simulation --











----- THE END -----