CSC-103 Programming Fundamentals

Prerequisite Knowledge: Loops, Conditions, Data Types, printf() and scanf().

Mini Project 1: Develop a Maze Solving Game.

Submission Deadline: 15th March 2019, 11:59 pm

Restrictions: Arrays, Pointers and user defined Functions are not allowed.

Game Description:

Ali has been visiting the mansion like house of the great grand father of his friend Asim. Ali has been given a room (R1) to stay the night by his host (Asim). As Ali lay awake due to the strange new place he was in, he felt very hungry. Remembering that there was some delicious Biryani left over, he decides to go get some Biryani from the kitchen (R9) refrigerator. The mansion is a labyrinth of rooms and corridors and suddenly Ali realizes that he can't seem to find his way to the kitchen.

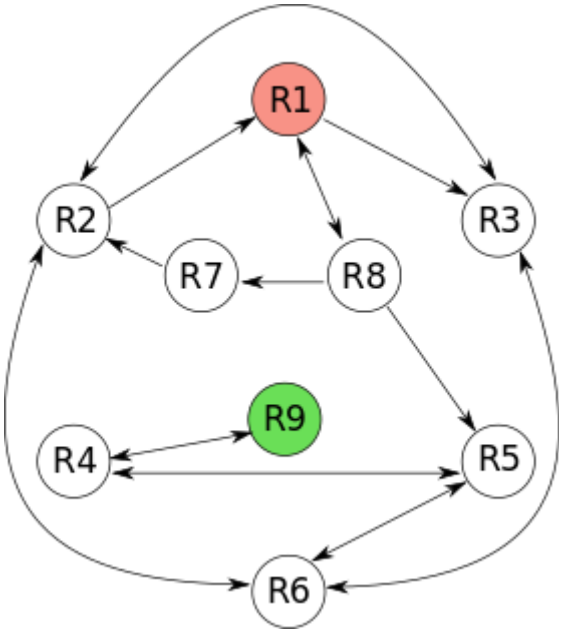

Figure 1: *Connections between all the rooms.*

You have to help Ali get to the kitchen and back to his room so that he may sleep peacefully. The mansion has 9 rooms in all numbered R1 to R9.

Task:

Figure 1 shows the connections between different rooms (R1, R2 etc) in the mansion. Arrows connecting the rooms represent the doors. A one-way arrow depicts a one-way door. E.g. the arrow between R8 and R5 means that Ali can enter R5 from R8 but but cannot use the same door back to R8. A two-way arrow depicts a two-way door what can be used to move freely between the connecting rooms (for example Ali can enter from R1 to R8 and back again).

Your task is to write a C program that fulfills the following requirements

1. It should present the player with options to try different doors (by entering a number 1-4).
2. If a door is open (arrow leaving the room node), player should find himself in the connecting room.
3. If the entered door number is invalid (e.g. the room only has 2 doors and the user enters 3), the user should get a message to ask him to enter a valid choice.
4. Your program must ensure that the connections shown in **Figure 1** are correctly implemented.
5. Upon entering the kitchen R9 (for the first time only) it should print a messaging congratulating the player that he has successfully guided Ali to the kitchen.
6. Upon entering the bedroom (R1) after visiting the kitchen (R9), it should print a message congratulating the player that he has finished the game successfully and return exit.

Deliverables and Grading: **Total Marks (7)**

- Working C program (**4**)
- A written report presenting the details of your solution. (**1**)
- A viva exam (**2**)

The C program along with the report in soft form must be submitted via the CU-Online portal before the deadline.

Note: Negative marks for plagiarized work.

Helpful Material: Finite State Machines (FSM based Design)

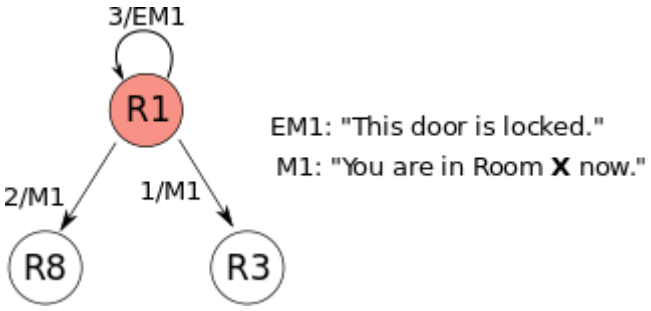

Figure 2: *FSM for Room1*

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