CS331 Assignment -6

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Requirements:

sudo apt-get install graphviz

generateMaze.cpp

I have made little bit changes in generateMaze.cpp file to run my prolog code in a smooth manner. I took Sir's permission for this. So, please run my prolog code with my generateMaze.cpp file.

Commands-:

$ g++ generateMaze.cpp -o generateMaze

$ ./generateMaze 10 10 0.3 1 1 9 9

Format-: ./generateMaze <height> <width> <faultynode probality> <sourceX> <sourceY> <DestX> <DestY>

$ swipl

?- [180101033].

Shortest Distance Command-:

?- getPath(sourceNode, detinationNode, Path). Press 'w' for full path.

Make faulty node command-:(to make a node faulty)

makeNodeFaulty(Node).

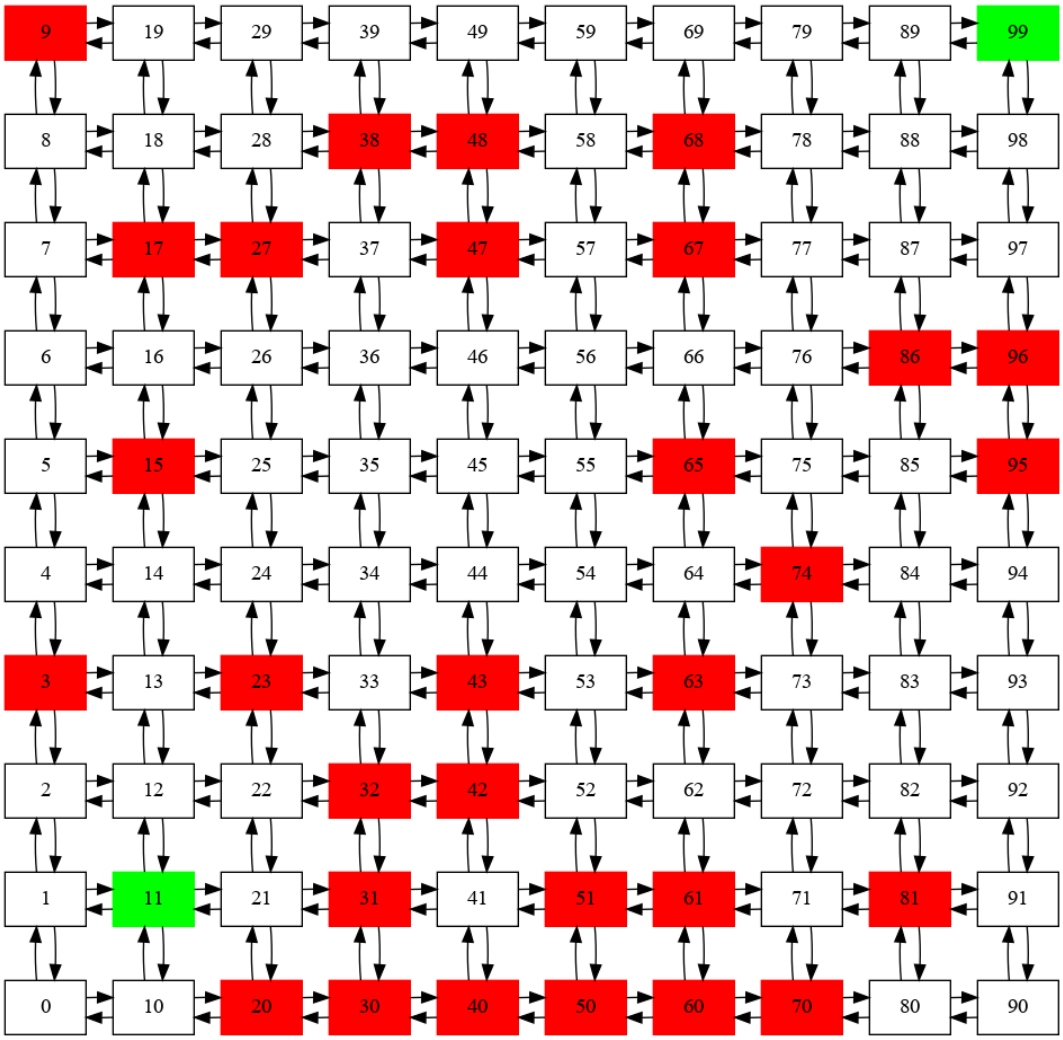
Remove Faulty Node Command-: (to make a faulty node non-faulty)

makeNodeNotFaulty(Node).

The output of the code and run time behaviour is shown in the screenshot below:

```
krtky@krtky-G3-3579:~/Downloads/180101033$ swipl
Welcome to SWI-Prolog (threaded, 64 bits, version 7.6.4)
SWI-Prolog comes with ABSOLUTELY NO WARRANTY. This is free software.
Please run ?- license. for legal details.

For online help and background, visit http://www.swi-prolog.org
For built-in help, use ?- help(Topic). or ?- apropos(Word).

?- [180101033].
true.

?- getPath(11,99,Path).
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55|...] [write]
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55, 56, 66, 76, 77, 87, 97, 98, 99] .

?- makeNodeFaulty(24).
Operation done on node 24

Now you may calculate the shortest path.
true.

?- getPath(11,99,Path).
Path = [11, 12, 13, 14, 4, 5, 6, 16, 26, 36, 46, 56, 66, 76, 77, 87, 97, 98, 99] [write]
Path = [11, 12, 13, 14, 4, 5, 6, 16, 26, 36, 46, 56, 66, 76, 77, 87, 97, 98, 99] .

?- makeNodeNotFaulty(24).
Operation done on node 24

Now you may calculate the shortest path.
true.

?- getPath(11,99,Path).
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55, 56, 66, 76, 77, 87, 97, 98, 99] [write]
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55, 56, 66, 76, 77, 87, 97, 98, 99] .

?- makeNodeFaulty(13).
Operation done on node 13

Now you may calculate the shortest path.
true.

?- getPath(11,99,Path).
false.

?- makeNodeNotFaulty(13).
Operation done on node 13

Now you may calculate the shortest path.
true.

?- getPath(11,99,Path).
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55, 56, 66, 76, 77, 87, 97, 98, 99] [write]
Path = [11, 12, 13, 14, 24, 34, 44, 54, 55, 56, 66, 76, 77, 87, 97, 98, 99] .

?-
```

In the graph1.png file, the graph is shown.



Explanation of output:

I marked node 24 as faulty using **makeNodeFaulty** command. Now the shortest path does not pass through node 24 rather it takes a left turn from node 14.

Now, I unmarked node 24 as faulty using **makeNodeNotFaulty** command. Again, I calculated the shortest path from node 11 to node 99 and I got the new shortest path.

After this, I marked node 13 as faulty. So, now there does not exist any path from node 11 to node 99, and that's why the command is returning false.

For any query or problem in running the code, contact me. Email: kartikay@iitg.ac.in Phone number: 8397078667