import java.applet.Applet;

import java.awt.\*;

import java.awt.event.ActionEvent;

import java.awt.event.ActionListener;

import java.io.\*;

import java.util.Scanner;

/\*\*

@author Govind Yatnalkar & Kanimozhi Kalaichelvan

\* @Marshall ID: 901875614, 901881363

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\* @CS580 Advanced OOPS Programming Assignment - JAVA Project - Maze Solver

\*/

public class MazeSolverTest extends Applet{

static char[][] maze;

int n, startX, startY, goalX, goalY;

String filename="C:\\Users\\Ezhil Malliga\\eclipse-workspace\\AssignmentLab\_MazeProject\\src\\maze5.txt";

Button nextButton = new Button("Next");

int count =0;

public void init() {

this.add(nextButton);

this.setSize(500,500); //you can choose the size

ActionListener listener = new NextListener();

nextButton.addActionListener(listener);

}

class NextListener implements ActionListener{

public void actionPerformed(ActionEvent event)

{

if(solveMaze())

System.out.println("Maze Solved Successfully!!");

else

System.out.println("Maze Not Solvable...");

WriteMaze();

repaint();

}

}

public void readMaze() {

try

{

FileReader fr = new FileReader(filename);

BufferedReader br = new BufferedReader(fr);

n = Integer.parseInt(br.readLine());

maze = new char[n][n];

for(int i = 0; i < n ;i++)

{

String s = br.readLine();

for(int j = 0; j< n; j++)

{

maze[i][j] = s.charAt(j);

if(maze[i][j] == 'S')

{

//Code to get start coordinate

startX=i;

startY=j;

}

if(maze[i][j] == 'G')

{

//Code to get the end coordinate

goalX=i;

goalY=j;

}

}

}

}

catch(FileNotFoundException e)

{

e.getMessage();

e.printStackTrace();

System.out.println("File Not Found");

}

catch(IOException e) {

e.getMessage();

e.printStackTrace();

System.out.println("Invalid Entry");

}

}

public void paint(Graphics g)

{

readMaze();

System.out.println();

int k= this.getHeight()/n;

int l= this.getWidth()/n;

for(int i = 0; i < n ; i++)

{

for(int j = 0; j < n ; j++)

{

if((maze[i][j]=='S')||(maze[i][j]=='G'))

{

g.setColor(Color.RED);

g.fillRect(i\*l,j\*k,l,k);

}

if(maze[i][j]=='#')

{

g.setColor(Color.BLACK);

g.fillRect(i\*l,j\*k,l,k);

}

if(maze[i][j]=='.')

{

g.setColor(Color.WHITE);

g.fillRect(i\*l,j\*k,l,k);

}

// System.out.print(maze[i][j]);

// if(maze[i][j]=='P')

// {

// g.setColor(Color.CYAN);

// g.fillRect(i\*l,j\*k,l,k);

// }

}

}

for(int q=0;q<10000000;q++)

for(int w=0;w<10000000;w++);

for(int i = 0; i < n ; i++)

{

for(int j = 0; j < n ; j++)

{

if(maze[i][j]=='P')

{

g.setColor(Color.CYAN);

g.fillRect(i\*l,j\*k,l,k);

for(int q=0;q<10000000;q++)

for(int w=0;w<10000000;w++);

}

}

}

}

public boolean solveMaze()

{

boolean status = solveMaze(startX, startY);

return status;

}

private boolean solveMaze(int x, int y) {

// Scanner mys = new Scanner(System.in);

System.out.println("Press Enter for next step \n "

+ "Currently Checking row = "+x+ " and column ="+y+" goalX = "+goalX+ " goalY = "+goalY );

// String e = mys.nextLine();

if(x<0 || x>=n || y<0 || y>=n)

return false;

if(x == goalX && y == goalY)

return true;

if (maze[x][y] == '#') {

return false;

}

if (maze[x][y] == 'G') {

return true;

}

if (maze[x][y] == 'P') {

return false;

}

if(maze[x][y]=='.')

{

maze[x][y] = 'P';

displayMaze();

}

if(solveMaze(x+1,y) == true)

return true;

if(solveMaze(x, y+1) == true)

return true;

if(solveMaze(x-1,y) == true)

return true;

if(solveMaze(x,y-1) == true)

return true;

return false;

}

public void displayMaze()

{

System.out.println();

for(int i = 0; i < n ; i++)

{

for(int j = 0; j < n ; j++)

System.out.print(maze[i][j]);

System.out.println();

}

}

public void WriteMaze() {

try

{

FileWriter fwrite = new FileWriter(filename);

PrintWriter pw = new PrintWriter(fwrite);

String len = Integer.toString(n);

fwrite.write(len);

pw.println();

for(int i = 0; i < n ;i++)

{

for(int j = 0; j< n; j++)

{

String str= Character.toString(maze[i][j]);

fwrite.append(str);

}

pw.println();

}

fwrite.close();

}

catch(FileNotFoundException e)

{

e.getMessage();

e.printStackTrace();

System.out.println("File Not Found");

}

catch(IOException e) {

e.getMessage();

e.printStackTrace();

System.out.println("Invalid Entry");

}

}

}