Homework 8

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Question 3

Problem-solution approach

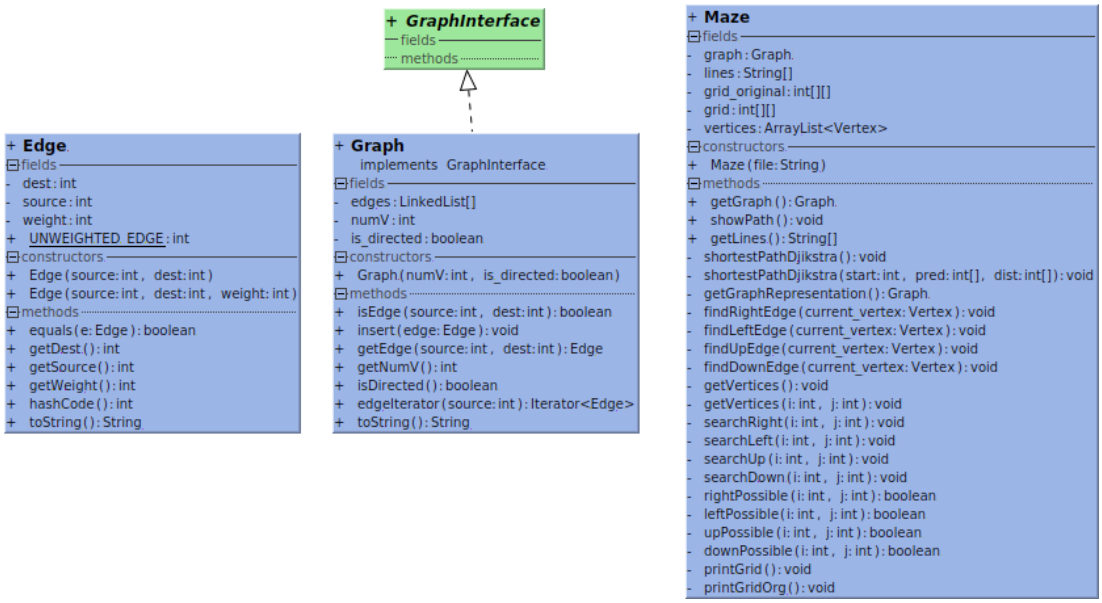
Here first thing I did was read the maze from a file and than converted those characters read into grid int array. Afterwards I had to convert this grid to a graph. My point is to convert it to a connected graph. I didn't want any unnecessary vertices that could be maybe trapped In a maybe and not connected to other vertices. Because of this I partially recursively traversed all the paths and added each vertex to a list of vertices. After that I used these found vertices to construct the graph from them. Weights were calculated with respect to row or column at which vertex is placed. After this I used adjacency list graph to solve the graph. For this graph I just implemented djikstra's algorithm and found the shortest path. Inside I used basic graph operations and graph's edgeIterator also. For visited vertices I used a boolean array. Also two ararys for distance and predecesting vertex. The shortest path can be displayed to console using the showPath() method.

Tests cases

Test cases are run inside the virtual machine provided. Its actual results can be confirmed from the attached screenshots.

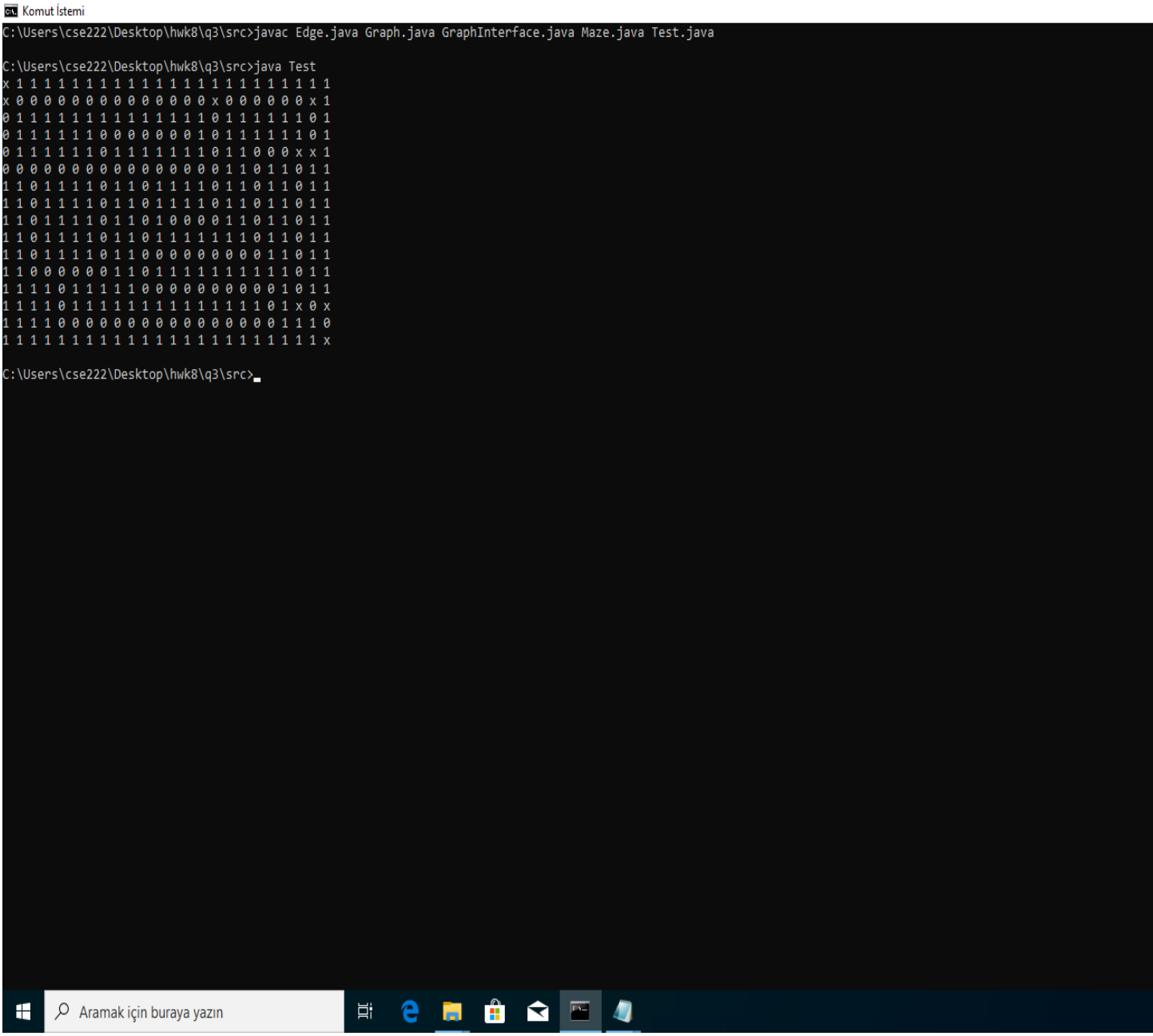
Test Scenario	Expected Results	Actual Results
Construct a maze from file	Should construct	As expected
Show the shortest path in console	Correct shortest path should be output(vertices visited denoted by x)	As expected

Class diagram



Running command and results

Output of the code executed in the virtual machine is provided in here


Komut İstemi
C:\Users\cse222\Desktop\hwk8\q3\src>javac Edge.java Graph.java GraphInterface.java Maze.java Test.java
C:\Users\cse222\Desktop\hwk8\q3\src>java Test
x 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
x 0 0 0 0 0 0 0 0 0 0 0 0 0 0 x 0 0 0 0 0 0 x 1
0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 0 1
0 1 1 1 1 1 1 0 0 0 0 0 0 0 1 0 1 1 1 1 1 1 0 1
0 1 1 1 1 1 1 0 1 1 1 1 1 1 1 0 1 1 0 0 0 x x 1
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 0 1 1 0 1 1
1 1 0 1 1 1 1 0 1 1 0 1 1 1 1 1 0 1 1 0 1 1 0 1 1
1 1 0 1 1 1 1 0 1 1 0 1 1 1 1 1 0 1 1 0 1 1 0 1 1
1 1 0 1 1 1 1 0 1 1 0 1 0 0 0 0 1 1 0 1 1 0 1 1
1 1 0 1 1 1 1 0 1 1 0 1 1 1 1 1 1 1 0 1 1 0 1 1
1 1 0 1 1 1 1 0 1 1 0 0 0 0 0 0 0 0 0 1 1 0 1 1
1 1 0 0 0 0 0 0 1 1 0 1 1 1 1 1 1 1 1 1 1 0 1 1
1 1 1 1 0 1 1 1 1 1 0 0 0 0 0 0 0 0 0 0 1 0 1 1
1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1 1 0 1 x 0 x
1 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 1 1 0
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 x
C:\Users\cse222\Desktop\hwk8\q3\src>
Aramak için buraya yazın