

**Gebze Technical University
Computer Engineering**

CSE 222 - 2018 Spring

HOMEWORK 8 REPORT

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1 INTRODUCTION

1.1 Problem Definition

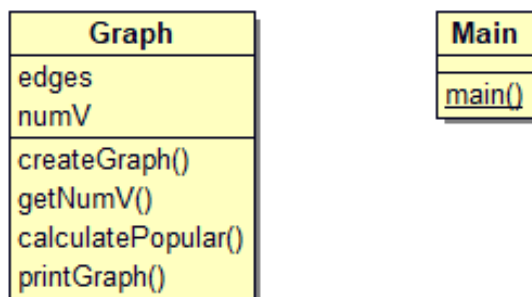
A group of people in which an ordered popularity relation is defined between person pairs. If there exist a relation such that (P1,P2) this means that A thinks that B is popular. The relation is transitive which means that if the relations (P1,P2) and (P2,P3) exist, than (P1,P3) also exist event if it is not specified by the input pairs. I write a Java program which finds the people who are considered popular by every other person. There is an input.txt file. Line 1 contains two space-separated integers, number of people and number of relations. Output should be the number of people who are consired popular by every other person.

1.2 System Requirements

This project requires the graph class and the main class for this class's scan object. The matrix structure will be used in the graph class so it should keep a two-dimensional array. A graphical method and auxiliary methods are required.

2 METHOD

2.1 Class Diagrams



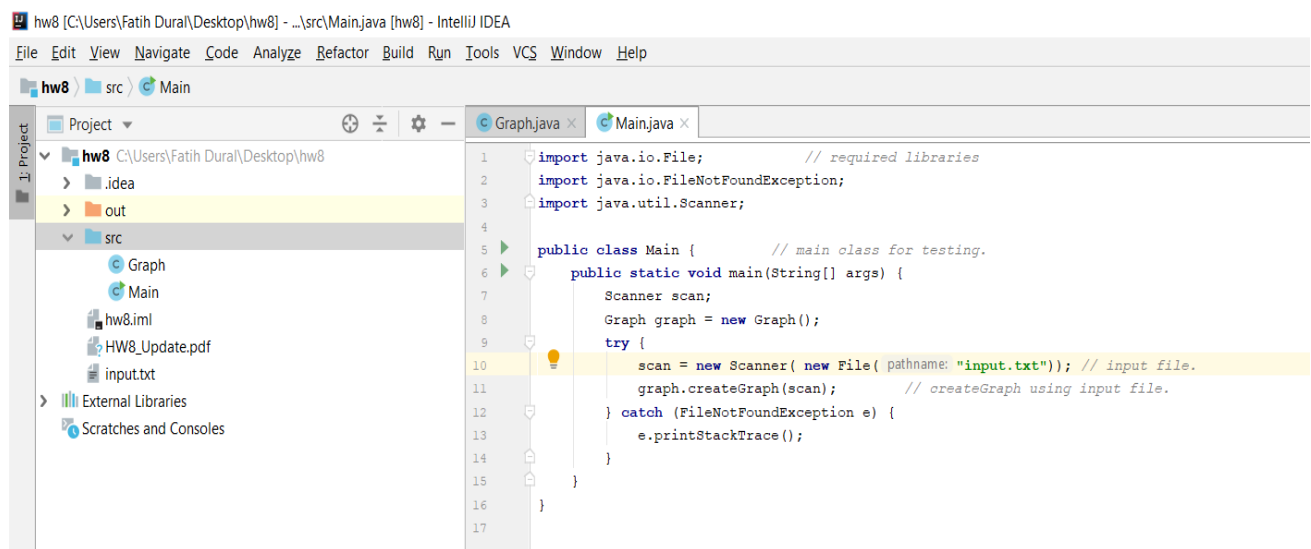
2.2 Problem Solution Approach

In the main class, I enter the input file as a parameter to the graph create method. numV numE is initially taken. Then integers are added to the array, check whether there is

a transitive feature. For 1 2, 2 3, see if there are any elements in column 2 if there is 1 3 passes. In order to prevent interference, I added the number 2 to the array in the transitive, I added 1 in the normal addition. The number of people who are popular with the calculatePopular method is found after the array fill. Time complexity varies from $O(V)$ to $O(1)$.

3 RESULT

3.1 Test Cases



```
hw8 [C:\Users\Fatih Dural\Desktop\hw8] - ...src\Main.java [hw8] - IntelliJ IDEA
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

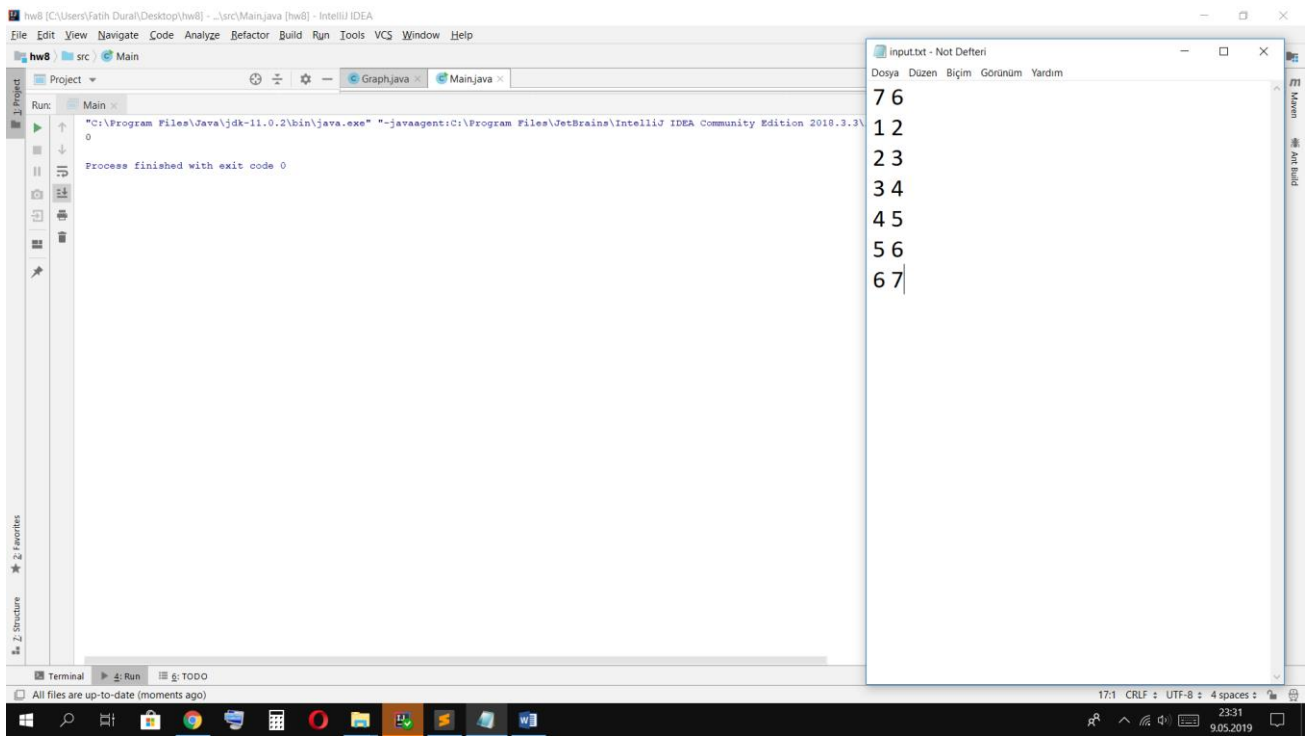
hw8 src Main
Project
  hw8 C:\Users\Fatih Dural\Desktop\hw8
    .idea
    out
    src
      Graph
      Main
      hw8.iml
      HW8_Update.pdf
      input.txt
    External Libraries
    Scratches and Consoles

1  import java.io.File;           // required libraries
2  import java.io.FileNotFoundException;
3  import java.util.Scanner;
4
5  public class Main {           // main class for testing.
6  public static void main(String[] args) {
7      Scanner scan;
8      Graph graph = new Graph();
9      try {
10         scan = new Scanner( new File( pathname: "input.txt")); // input file.
11         graph.createGraph(scan); // createGraph using input file.
12     } catch (FileNotFoundException e) {
13         e.printStackTrace();
14     }
15 }
16
17
```

3.2 Running Results

```
hw8 [C:\Users\Fatih Dural\Desktop\hw8] - ./src/Main.java [hw8] - IntelliJ IDEA
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
Project: hw8
src Main
Run: Main
"C:\Program Files\Java\jdk-11.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2018.3.3\lib\idea_rt.jar=2330:C:\Program Files\Java\jdk-11.0.2\bin\java.exe"
Process finished with exit code 0
input.txt - Not Defteri
Dosya Düzen Biçim Görünüm Yardım
6 15
1 2
2 1
2 3
5 6
1 3
4 2
3 6
6 1
2 6
1 5
1 1
1 3
3 4
4 5
3 2
Terminal Messages Run TODO
Compilation completed successfully in 2 s 359 ms (moments ago)
5:1 CRLF UTF-8 4 spaces 23:30 9.05.2019
```

```
hw8 [C:\Users\Fatih Dural\Desktop\hw8] - ./src/Main.java [hw8] - IntelliJ IDEA
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
Project: hw8
src Main
Run: Main
"C:\Program Files\Java\jdk-11.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2018.3.3\lib\idea_rt.jar=2330:C:\Program Files\Java\jdk-11.0.2\bin\java.exe"
Process finished with exit code 0
input.txt - Not Defteri
Dosya Düzen Biçim Görünüm Yardım
3 3
1 2
2 1
2 3
Terminal Messages Run TODO
All files are up-to-date (moments ago)
5:1 CRLF UTF-8 4 spaces 23:30 9.05.2019
```



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