
Programming Assignment 4: Social Network

Topics

String Methods, for-loop, Array, 2-D Array

Problem

You are intrigued by these social networking websites and want to know how they work. You started with figuring out your school's social network. You want to know who is friends with who and how many friends each person has. Write a program that shows a two dimensional array of friends where each element taking a value of either 1 or 0 representing whether the person at row i is friends with person at column j . Your program should also output the number of friends each person has.

Procedure

1. Ask the user to enter the total number of people in the network to create the 2-D array (There should be at least 1 person in the network).
2. Store their names in a separate array
3. We will decide whether one person is friends with another if their names' lexicographic difference is not greater than 12
4. Populate the 2-D array with 1 representing row i and column j being friends and 0 representing row i and column j not being friends
5. You should assume that you are not friends with yourself, which means that $ArrayOfFriends[i][j] = 0$, where $i = j$
6. Output the 2-D array to the screen (use only tabs for spacing)

-
7. Also output the total number of friends each person has (calculate using the 2-D Array).

Sample Outputs

```
----jGRASP exec: java SocialNet
What is the total number of friends in the network:
>> f
fis an incorrect input! Please enter an integer.
>> 3
Enter name:
>> Jack
Enter name:
>> Jill
Enter name:
>> Bob

      Jack  Jill  Bob
Jack  0   1   1
Jill  1   0   1
Bob   1   1   0

Total Friends Count:
Jack  2
Jill  2
Bob   2

----jGRASP: operation complete.
```

```
----jGRASP exec: java SocialNet
What is the total number of friends in the network:
>> 2
Enter name:
>> Cat
Enter name:
>> Zebra
      Cat    Zebra
Cat    0    0
Zebra 0    0

Total Friends Count:
Cat    0
Zebra 0

----jGRASP: operation complete.
```

```
----jGRASP exec: java SocialNet
What is the total number of friends in the network:
>> 2
Enter name:
>> Jack
Enter name:
>> Jill
      Jack    Jill
Jack    0    1
Jill    1    0

Total Friends Count:
Jack    1
Jill    1

----jGRASP: operation complete.
```

Error Handling

Your code should handle user input errors using loops. For example, if they enter strings like “*jane*” when you are expecting an integer, you should tell the user to enter the correct input. See sample outputs. Same applies for

total number of people in the network.

Hints

- `Math.abs()` method
- `String's compareTo` method
- `Scanner's hasNextInt()` method
- Use debugger and breakpoints to find array errors

Grading Criteria - 100pts

1. Header [5]: Author, Date, Purpose, etc.
2. Good Programming Practices [5]: commenting, white space, indentation, etc.
3. Pseudocode [5]: show main logic design within one page. You should have pseudocode before coding. Don't copy/change your source code.
4. Errors [5]: show at least 5 different screenshots for different errors, followed by explanation of those errors and how you fixed it
5. Code [80]: [60] - based on the number of test cases passed on zyBook's PA4 in PAs Chapter and [20] - based on manual inspection. The sample outputs are just for reference. Your program will be tested on large inputs.

Note: If your code does not compile, your score will be an automatic zero regardless of other assignment sections (no partial credits), with the exception of contacting me beforehand. Also, do not submit your java code in a *docx* or *pdf* file, it has to be a *.java* file. You are more likely to receive better partial credits if you document and explain the errors that you were not able to fix, rather than me finding it.

Deliverables

1. *SocialNet.java* - Use the template java file provided and do not change the class name
2. Everything else should be in a PDF file and name it *LastName-FirstName-Report.pdf*

Compress two files into a zip file and name it LastName-FirstNamePA4.
Submit the zip file online.