Assignment Prefix: Lab111

Points: 100

Due Date: Friday, May 3, 2018 @ 11:59pm

For this assignment you may use any classes from the online version of the code for the textbook. The textbook code is in a jar (Java archive) file which uses the zip file format. One easy way to deal with a jar file is to rename the file with a .zip extension, use Windows Explorer to browse the zip archive, and copy and paste the necessary class files into your NetBeans project directory.

Note 1– In Windows you will need to make file extensions visible using File Explorer Options -> View tab, uncheck Hide extensions for known file types box.

I still believe that there is a learning benefit from transcribing the code from the textbook but many of the needed classes are not in the textbook so you are allowed to copy and paste the code from the online jar file.

Note 2 – you may need to comment out the package statement in each of the files that you copy from the online version of the code.

**Task 1:**

* Create a new NetBeans project named Lab111-LastFM following the naming convention used in previous assignments.
* Place the GraphExamples.java file from the online version of the code for the textbook into your project’s source code directory
* This GraphExamples.java file contains the main class.
* Add additional .java files from the online version of the code for the textbook until you are able to compile and run the main class without errors.
* **You will need to include more than ten but less than twenty Java classes and interfaces.**
* **Points will be deducted for any unnecessary Java classes that are included in your assignment.**
* Notice that the output of the program is essentially the Adjacency List Structure described in section 14.2.2

**Task 2:**

* Modify your project so that in addition to printing out the Adjacency List Structure it also prints out the Adjacency Matrix Structure as a nicely formatted ASCII table.
* Write your code so that:
  + It uses the same input (i.e. an edge list).
  + It can correctly handle edge lists that represent
    - Directed or undirected graphs by using a boolean parameter as is already done to create the Adjacency List Structure.
    - Weighted or unweighted graphs automatically (without the use of a parameter) by examining the edge list.
  + Examples of the output can be found at the end of this assignment.

**Turning in your assignment:**

* **Make sure that all of your code is properly documented.**
* Turn in your assignment using the standard method.
* Create a Word document that contains:
  + A screenshot of your output
  + Your modified GraphExamples client class
  + A screen shot of your projects Source Packages list showing all of the java files in your project.
  + Any other files you wrote or modified for this assignment.
  + Do not include files that you only modified the package statement.
* Export your NetBeans project to a zip archive.
* Turn in the Word document, and zipped project file as separate files in a single Blackboard submission.

Below is an example of what your output should look like:

run:

Figure 14.3

Vertex BOS

[outgoing] 3 adjacencies: (MIA, 1) (SFO, 1) (JFK, 1)

[incoming] 1 adjacencies: (JFK, 1)

Vertex DFW

[outgoing] 3 adjacencies: (LAX, 1) (ORD, 1) (SFO, 1)

[incoming] 3 adjacencies: (MIA, 1) (JFK, 1) (ORD, 1)

Vertex JFK

[outgoing] 4 adjacencies: (BOS, 1) (MIA, 1) (DFW, 1) (SFO, 1)

[incoming] 1 adjacencies: (BOS, 1)

Vertex LAX

[outgoing] 1 adjacencies: (ORD, 1)

[incoming] 2 adjacencies: (MIA, 1) (DFW, 1)

Vertex MIA

[outgoing] 2 adjacencies: (LAX, 1) (DFW, 1)

[incoming] 3 adjacencies: (ORD, 1) (JFK, 1) (BOS, 1)

Vertex ORD

[outgoing] 2 adjacencies: (MIA, 1) (DFW, 1)

[incoming] 2 adjacencies: (DFW, 1) (LAX, 1)

Vertex SFO

[outgoing] 0 adjacencies:

[incoming] 3 adjacencies: (DFW, 1) (BOS, 1) (JFK, 1)

Figure 14.3:

+---------+---------+---------+---------+---------+---------+---------+---------+

| | BOS | DFW | JFK | LAX | MIA | ORD | SFO |

+---------+---------+---------+---------+---------+---------+---------+---------+

| BOS | 0 | 0 | 1 | 0 | 1 | 0 | 1 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| DFW | 0 | 0 | 0 | 1 | 0 | 1 | 1 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| JFK | 1 | 1 | 0 | 0 | 1 | 0 | 1 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| LAX | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| MIA | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| ORD | 0 | 1 | 0 | 0 | 1 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| SFO | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

Figure 14.11

Vertex BOS

[outgoing] 2 adjacencies: (JFK, 1) (MIA, 1)

[incoming] 1 adjacencies: (JFK, 1)

Vertex DFW

[outgoing] 3 adjacencies: (LAX, 1) (ORD, 1) (SFO, 1)

[incoming] 3 adjacencies: (ORD, 1) (MIA, 1) (JFK, 1)

Vertex JFK

[outgoing] 4 adjacencies: (BOS, 1) (SFO, 1) (DFW, 1) (MIA, 1)

[incoming] 1 adjacencies: (BOS, 1)

Vertex LAX

[outgoing] 1 adjacencies: (ORD, 1)

[incoming] 2 adjacencies: (DFW, 1) (MIA, 1)

Vertex MIA

[outgoing] 2 adjacencies: (LAX, 1) (DFW, 1)

[incoming] 2 adjacencies: (JFK, 1) (BOS, 1)

Vertex ORD

[outgoing] 1 adjacencies: (DFW, 1)

[incoming] 2 adjacencies: (LAX, 1) (DFW, 1)

Vertex SFO

[outgoing] 0 adjacencies:

[incoming] 2 adjacencies: (DFW, 1) (JFK, 1)

Figure 14.11:

+---------+---------+---------+---------+---------+---------+---------+---------+

| | BOS | DFW | JFK | LAX | MIA | ORD | SFO |

+---------+---------+---------+---------+---------+---------+---------+---------+

| BOS | 0 | 0 | 1 | 0 | 1 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| DFW | 0 | 0 | 0 | 1 | 0 | 1 | 1 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| JFK | 1 | 1 | 0 | 0 | 1 | 0 | 1 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| LAX | 0 | 0 | 0 | 0 | 0 | 1 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| MIA | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| ORD | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| SFO | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

Figure 14.14

Vertex BOS

4 adjacencies: (SFO, 2704) (MIA, 1258) (JFK, 187) (ORD, 867)

Vertex DFW

4 adjacencies: (LAX, 1235) (SFO, 1464) (MIA, 1121) (ORD, 802)

Vertex JFK

3 adjacencies: (MIA, 1090) (BOS, 187) (ORD, 740)

Vertex LAX

3 adjacencies: (MIA, 2342) (DFW, 1235) (SFO, 337)

Vertex MIA

4 adjacencies: (BOS, 1258) (DFW, 1121) (JFK, 1090) (LAX, 2342)

Vertex ORD

4 adjacencies: (SFO, 1846) (JFK, 740) (BOS, 867) (DFW, 802)

Vertex SFO

4 adjacencies: (ORD, 1846) (LAX, 337) (BOS, 2704) (DFW, 1464)

Figure 14.14:

+---------+---------+---------+---------+---------+---------+---------+---------+

| | BOS | DFW | JFK | LAX | MIA | ORD | SFO |

+---------+---------+---------+---------+---------+---------+---------+---------+

| BOS | 0 | 0 | 187 | 0 | 1,258 | 867 | 2,704 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| DFW | 0 | 0 | 0 | 1,235 | 1,121 | 802 | 1,464 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| JFK | 187 | 0 | 0 | 0 | 1,090 | 740 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| LAX | 0 | 1,235 | 0 | 0 | 2,342 | 0 | 337 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| MIA | 1,258 | 1,121 | 1,090 | 2,342 | 0 | 0 | 0 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| ORD | 867 | 802 | 740 | 0 | 0 | 0 | 1,846 |

+---------+---------+---------+---------+---------+---------+---------+---------+

| SFO | 2,704 | 1,464 | 0 | 337 | 0 | 1,846 | 0 |

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