Assignment Prefix: lab12
Points: 100
Due Date: Tuesday, December 6, 2016 @ 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 that I still believe that there is a learning benefit from transcribing the code from the textbook but you are allowed to copy and paste the code from the online jar file.

Task 1:

- Create a new NetBeans project named Lab12
- 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.
- **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 your wrote or modified for this assignment.
  - Do not include any files that you did not modify.
- 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