CS116

LAB 8

This Lab is due April 21 on Blackboard time stamped by 10:00 p.m.

This lab. assignment is worth 5 points.

Objectives:

1. Using IO streams.
2. Using Object Streams to write objects in a file and read them back from the file.
3. Implementing methods that can throw multiple exceptions.
4. Write and read objects from a file.
5. Working with recursion problems.

Task 1 (Writing/Reading Objects) 5 points)

In this lab we want to use the solution from Lab 6 Task 2. We will be writing objects into a binary coded file using object streams and we will be reading these objects back from the file. The purpose of this lab is to demonstrate that a serialized object carries with it all the inherited classes when it is written in a file. The entire hierarchy of classes is recovered from the file when it is read including library classes that may have been imported (keep in mind that an object of the class that we are creating can hierarchically inherit library classes also).

In other words, not only the fields of the serialized object class, but also the entire hierarchical tree information is saved (the fields of the super class are also saved). For example, let us go back to Lab 5 for a moment and let us assume that the super class Employee was declared to be serializable. That is all we need to do, we do not need to declare the subclasses Engineer e.t.c serializable. They become serializable simply because they inherit a serializable class (the Employe class).

When we write an Engineer type of object into a .ser file (binary coded file for objects), the values of the attributes of class Employee are also saved in the file, since Engineer inherits Employee. Make sure that you open the file and examine its contents after you interpret your program. Even though most of the data is encoded, you should be able to determine that more information is stored in the .ser file every time the program is run.

Now let us go back to the Lab 6 Task 2 solution and decide which objects are to be declared serializable and which objects we are going to write into the .ser file. In Lab 6 Task 2 we deal with an abstract class called Figure and with subclasses of Figure. We also have a class called Customers. We will like to serialize both of these classes.

Programming instructions:

1. Use your files from Lab 6 Task 2 (not my solution files). If your program had mistakes, you will need to correct them so that the program in Lab 6 Task 2 works correctly. Do not use my solution!
2. Modify the proper classes so that they become serializable.
3. Modify the class FigureCost so that the code that is responsible for writing into the text file output.txt is deleted.
4. Now, create the proper streams to write the objects stored in the ArrayList of Figure types in a file named **figures.ser**. Write one Figure object at a time in the file.
5. Next capture all the Customers objects created and write them one at a time in a file called customers.ser.
6. Next write the objects from the ArrayList of String types that have the information about the cost of each drawing, into the file cost.ser.
7. Next ask the user if the user wants to have the files read (again use the example demonstrated in class). Ask the user for one file at a time. If the user types "read" the file figures.ser is opened for reading with the proper streams. It reads the Figure objects recorded and displays each object as read on the DOS window. Anything else typed by the user causes the program to terminate. The same applies for the files customers.ser. and cost.ser.
8. Compile and run the programs.

File objects.ser is created

SAMPLE OUTPUT

```
C:\CS116\SPRING2014\Labs\Lab8\Lab8Solution\TASK1>java FigureCost
Please enter the shape the length(or radius) and the asked value separated by space or type done
cube 2.0 area
Please enter the shape the length(or radius) and the asked (area or volume) separated by space or type done
sphere 3.0 volume
Please enter the shape the length(or radius) and the asked (area or volume) separated by space or type done
cube 1.0 volume
```

Please enter the shape the length(or radius) and the asked (area or volume) separated by space or type done
sphere 5.0 area
Please enter the shape the length(or radius) and the asked (area or volume) separated by space or type done
done
I am ready to create the file figures.ser
I am reday to create the file customers.ser
Please enter the 2 pieces of information for type and score for a customer object separated by space or type done
Architect 500
Please enter the information for type and score for a customer object separated by space or type done
Other 700
Please enter the information for type and score for a customer object separated by space or type done
done
I am ready to create the file cost.ser
If you want the file figures.ser read type the word read otherwise type anything else to stop the program
read
The name of the shape is: cube The length is 2.0 And the parameter asked for is: area
The name of the shape is: sphereThe radius is 3.0 And the parameter asked for is: volume
The name of the shape is: cube The length is 1.0 And the parameter asked for is: volume
The name of the shape is: sphereThe radius is 5.0 And the parameter asked for is: area
null
Closing the file
If you want the file customers.ser read type the word read otherwise type anything else to stop the program
read
type= Architect score= 500
type= Other score= 700
null
Closing the file
If you want the file cost.ser read type the word read otherwise type anything else to stop the program
read
The area drawing cost for an Architect with score <600 is 480 (note: 1st cube)
The area drawing cost for an Other with score >=600 is 480 (note: 1st cube)
The volume drawing cost for an Architect with score <600 is 6785.84 (note: 2nd sphere)
The volume drawing cost for an Other with score>=600 is 8482.3 (note: 2nd sphere)

The volume drawing cost for an Architect with score <600 is 40 (note: 3rd cube)
The volume drawing cost for an Other with score>=600 is 50 (note: 3rd cube)
The area drawing cost for an Architect with score <600 is 12566.37 (note: 4th sphere)
The area drawing cost for an Other with score >=600 is 12566.37 (note: sphere)
Null
Exiting the program

Closing the fileSubmission instructions

- In your submission you must include
    a. This document with the answers (copies of the outputs as requested above).
    b. The source code files and the compiled files from Task 1 in the folder Task1.
- Zip all files and name the zip file using your first name followed by your last name followed by lab1.
    i.e. George_KayLab8.zip
- Upload the file on Blackboard by 10:00 p.m. on the due date (Blackboard time stamps automatically)