**COMP 132 - Homework # 1**

**Objects and Classes**

**Part 1**

1. Is the computer that you are using to read this web page an object or a class? Justify your answer.

2. Give a real-world example of a class and at least two instances of that class.

**Part 2 (uses Car.java)**

3. When you create a new Car object, what attributes does the car object have? What are the values of its attributes? How can you tell?

4. Which field of a Car object changes when you call the setMake method?

5. What is the type of the color field? Of the year field?

6. What does the getYear method do? What type of value does it return?

**Part 3 (uses Account.java)**

7. Add a main method to Account.java. In the main method, create an instance of the Account class with account number 12345, and then deposit $5 into the account. What information is displayed when you call the print method? What value is returned when you call the getBalance method?

8. Deposit another $3 into the account. Now what information is displayed when you call the print method?

9. Add a field customerName of type String to the Account class. Copy and paste your field declaration as your answer to this question. Ensure that no errors are introduced in the code by adding this code.

10. Add another constructor to the Account class that takes the account number, a balance for the account, the customer's name, and the accountType as parameters and uses their values to initialize the fields of the object as appropriate. (Also be sure to add the accountType field.) Copy and paste this definition of the new constructor into your answer for this exercise.

11. Add an accessor method named getCustomerName to the Account class. This method should return the customer's name. Copy and paste the definition of the new accessor into your answer for this exercise.

12. Does the Account class contain any accessor methods in addition to getBalance? If so, name them.

13. List all mutator methods in the Account class. How do you know that they are mutators?

**Part 4 (uses Account2.java)**

18. Modify the print method so that it does not use + to concatenate any Strings, but still produces exactly the same output. Copy and paste your revised method definition into your answer for this exercise.

Hints: use System.out.print, rather than System.out.println. The following code:

System.out.print("Using print");

System.out.println("instead");

System.out.print("of println");

will produce this output:

Using print instead

of println.

You can also print out the value of a field by passing it as a parameter to print. For example: System.out.print(balance); will display the value of the balance field.

19. In Java, what is the value of the following expression?: 99 / 100

20. In Java, what is the value of the following expression?: 99 % 21

**Part 5**

21. Implement a Computer class that represents computers as follows:

a. create a new class called Computer.

b. In the Computer class, declare fields so that each instance of the class can keep track of the manufacturer, amount of main memory (in MB or millions of bytes), and amount of disk drive storage (in GB or billions of bytes) of a computer. Make sure that your class compiles correctly. Note that the fields should all be private.

c. Add a constructor that initializes all fields of a Computer using parameters.

d. Add a method called getMainMemory that returns the amount of main memory in the computer in gigabytes (GB or billions of bytes), not megabytes (MB). Note that 1 GB is 1024 MB. Any fractional part of a gigabyte should be ignored. For example, if the computer has 1500 MB of main memory, the getMainMemory method should return 1.

e. Add a method called print that prints all information about a Computer on the screen. For example, for a Dell computer with 512 MB of main memory and a 40 GB drive, the method could print: "A Dell computer with 512 MB of memory and a 40 GB drive."

Be sure to write comments for each constructor and method in your Computer class (use those in the Account class as a guide). Also be sure to test the constructor and each method to be sure they work. Copy and paste the source code for your Computer class as your answer for this problem.

22. The following definition of class Book contains at least four errors that would prevent the class from compiling. Identify each error, and explain why it is an error. Do not use Eclipse to find the errors.

class public Book {

 private String title; // title of the book

 private String author; // author of the book

 private int numPages // number of pages

 /\*\* create a new Book with the specific field values

 \* @param initTitle the title

 \* @param initAuthor the author

 \* @param initNumPages the number of pages

 \*/

 public NewBook(String initTitle, String initAuthor, int initNumPages) {

 title = initTitle;

 author = initAuthor;

 numPages = initNumPages;

 }

 /\*\* get the title of the book

 \* @return the title of the book \*/

 public String getTitle() {

 return title;

 }

 /\*\* set the author of the book

 \* @param newAuthor the new author of the book \*/

 public void setAuthor(String newAuthor) {

 initAuthor = newAuthor;

 }

}