ComS 207: Programming I

Homework 2

Out: Wed. Aug 30, 2006

Due: Fri. Sep 8, 2006 (*BEFORE* the start of class)

Student Name:

Recitation Section:

1. **Escape Sequences**

   For each of the following snippets of code write down what will be printed on the screen.

   (a) ```
        System.out.print ("\u0047\u006f\u0020\u0043\u0079\u0063");
        System.out.println("\u006c\u006f\u006e\u0065\u0073\u0021");
        ```

   (b) This code will not run correctly in jGRASP. Use the command prompt if you decide to run it.

   ```
   System.out.print  ("Java\tis\n\t\t\bready\nfor\tinternational\n");
   System.out.println("\tuse\nthanks\tto\n\tunicode\ncharacters.\n");
   System.out.println("\'\\u004A\'\tis\tthe\u0020unicode\u0020for\br\u0020\"\u004A\"");
   ```

Now do the the inverse operation. For each of the following output lines write down snippets of code the that can generate them.

(c) Please use unicode characters for this one (similar to a).

```
========= OUTPUT =========
"Hello World!"
======= YOUR CODE ========
```

(d) Use the tab escape sequence to make the columns line up.

```
========= OUTPUT =========

Name        HW1   HW2   HW3
----        ---   ---   ---
John        80    92    70
Mary        90    99    95
Adam        91    79    93

======= YOUR CODE ========
```

(e)

```
======== OUTPUT ========

////////////\\\\\\\\\\\\
== "ComS 207 Rocks!"  ==
\\\\\\\\\\\\////////////

====== YOUR CODE =======
```

2. **Evaluating Assignments**

   Given the following declarations, what result is stored in each of the listed assignment statements?

   [Same as Exercise 2.6 on p. 107 in the textbook]

   ```
   int iResult, num1 = 25, num2 = 40, num3 = 17, num4 = 5;
   double fResult, val1 = 17.0, val2 = 12.78;
   ```

   a. iResult = num1 / num4;   j. fResult = (double) (num1 / num2);

   b. fResult = num1 / num4;   k. iResult = (int) (val1 / num4);

   c. iResult = num3 / num4;   l. fResult = (int) (val1 / num4);

3

d. fResult = num3 / num4;

m. fResult = (int) ((double) num1 / num2);

e. fResult = val1 / num4;

n. iResult = num3 % num4;

f. fResult = val1 / val2;

o. iResult = num2 % num3;

g. iResult = num1 / num2;

p. iResult = num3 % num2;

h. fResult = (double) num1 / num2;

q. iResult = num2 % num4;

i. fResult = num1 / (double) num2;

3. **Order of Evaluation**

   For each of the following expressions, indicate the order in which the operators will be evaluated by writing a number beneath each operator. [Same as Exercise 2.7 on p. 108 in the textbook]

   a. a - b - c - d

   b. a - b + c - d

   c. a + b / d / d

   d. a + b / c * d

   e. a / b * c * d

   f. a % b / c * d

   g. a % b % c % d

   h. a - (b - c) - d

   i. (a - (b - c)) - d

   j. a - ((b - c) - d)

   k. a % (b % c) * d * e

   l. a + (b - c) * d - e

   m. (a + b) * c + d * e

   n. (a + b) * (c / d) % e

4. **Expression Trees**

For each of the following two expressions draw their corresponding expression trees in the space below.

a) (a*b -(c%d))/(1+e)   b) a+ ((b%c) - ((d+e*f)) + g*(h/i)*j)/k

5. **Programming Projects**

   Choose ***three of the following five*** programming projects and implement them. Your grade will NOT depend on which ones you choose. Just puck the ones that you like.

   (a) Currency Converter

   Write an application that reads a single value representing an amount in US dollars and prints out its equivalent amount in three other currencies of your choice. To get the required exchange rates go to http://xe.com/

   For example, suppose that you entered 100.00 USD and you picked Euros, Japanese Yen, and Bulgarian Leva as your three currencies. Here is a sample output of the program (the exchange rates were valid as of Jan 16, 2005)

```
=================================================
Please enter amount of UDS:  100.00

100.00 USD =   82.4778 EUR (Euros)
100.00 USD = 11486.91 JPY (Japanese Yen)
100.00 USD =  161.355 BGN (Bulgarian Leva)
=================================================
```

   (b) Calculate Your Grade For This Class

   Write an application that calculates your final numeric grade for this class. Your program must ask the user to enter five floating point values (in the range 0.00 to 100.00) which represent your scores for attendance, homework assignments (all 10 homeworks combined), first midterm exam, second midterm exam, and final exam. The weight of each of the five components is specified in the class syllabus. For example, suppose that the user enters (100.00, 90.00, 85.0, 90.0, and 92.0). In this case the program should print out 0.905 (which according to the syllabus will correspond to A-, but you don't have to print the letter grade).

   (c) Converting Hours to Seconds

   Write an application that reads values representing a time duration in hours, minutes, and seconds, and then prints the equivalent total number of seconds (For example, 1 hour, 28 minutes, and 42 seconds is equivalent to 5322 seconds.)

   [Same as programming project 2.6 on p.109 in the textbook]

   (d) Converting Seconds to Hours

   Create a revised version of the previous project that reverses the computation. That is, read a value representing a number of seconds, then print the equivalent amount of time as a combination of hours, minutes, and seconds. (for example, 9999 seconds is equivalent to 2 hours, 46 minutes, and 39 seconds).

   [Same as programming project 2.7 on p.109 in the textbook]

(e) Print a Name Tag

Suppose that you are in charge or organizing a social event for students. You want to print name tags for all attendees but you don't know who will show up in advance. Therefore, you decide to write a java program that will ask each student that shows up to enter his name (First and then Last) and his major. The program will then print a name tag for the student.

For the purposes of this assignment, the program must print only one name tag per execution and must print it on the screen only (i.e., not on the printer). You can format the name tag any way you want (see below for one example). The only requirement is that the name is printed in the following format (LAST, FIRST) and the major is printed below the name. You will not be graded on how pretty the name tag looks.

```
+--------------------------+
|                          |
|       Bond, James        |
|    Major: Criminology    |
|                          |
+--------------------------+
```

6. *** For Advanced (or Bored) Students Only!**

   Implement the same problem as in 5.e but this time do is as an applet which draws the name tag. Please use at least two colors to make the name tag more flashy.

   Note: We have not covered applets yet but if you are an advanced student your should be able to learn how to use them on your own. Read sections 2.7 - 2.9 of the textbook.

7. **What to Submit**

   Print paged 1-6 of this assignment. Write your name and recitation section on the top of the printout. For parts 1, 2, 3, and 4 write your answers on the printout. For part 5 submit three additional printouts, one for each of the three programs that you chose to write. The printouts should represent complete programs, not just snippets of code. If you choose to do part 6 submit a printout for it as well.

   Submit your homework *BEFORE* the start of class on Friday, Sep 8.

   IMPORTANT: Staple all of your printouts together. We are not be responsible for finding missing or misplaced pages.

   IMPORTANT: Once again, no late homeworks will be accepted.

That's it. Good Luck!