**CSCI 1100 – Fall 2016**

**Assignment 1 – Due Sunday Oct. 23 at 11:00 pm (night time)**

**Submit on Brightspace**

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**Assignments are to be your own work. If you have questions, you can ask your Instructor, course TAs, or TAs in the Learning Centre.**

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| **Declaration: Please complete this declaration** | | |
| 1 | “This document is entirely my own work.” If no, acknowledge any assistance below; outside help should only be used to help you understand the questions NOT to provide the solutions. | Yes/no. |
| 2 | I obtained help to complete this document (e.g., from a TA). | Yes/no. If Yes, give Details. |
| 3 | This document contains some guidance from the Internet or another document or file or program (e.g., Java's API). | Yes/no. If Yes, give details and provide references. |

*Your task is to complete this report using Word and JGrasp and to submit the complete Word document on Brightspace saved as a pdf. Acknowledge any help that you obtained from your Lab or Learning Centre TAs in the table above.* ***Again note, assignments must be your own work****.*

**Submit using Brightspace. Make sure you double check that the file has been added to Brightspace.TAs can only provide help in understanding the problem and by giving other small hints.**

**Make sure your programming code is neatly formatted and properly commented (you will lose marks for poor formatting and commenting).**

**Also, be sure to provide the requested number of test outputs. Each test output must be different from the sample outputs given for each question.**

**Question 1.** Write a Java application that displays a triangle 4 lines high, made up of two different numbers. The program will ask a user to input two numbers: one between 0 and 4 and one between 5 and 9. The first and third line of the triangle will be filled with the first number; the second and last line of the triangle will be filled with the second number.

***Sample output:***

Input a number between 0-4: 2

Input a number between 5-9: 6

2

6 6

2 2 2

6 6 6 6

Provide a printout of properly formatted source code (your entire Java program).

Provide 2 example outputs/test cases.

**Question 2.** Write a Java application that displays an upside down triangle 4 lines high, made up of one of two possible characters: *asterisk* [\*] **OR** *Dollar Sign* [$]. The program will ask a user to enter one number between 1 and 10. If the number is odd, the triangle will be made up of asterisks; if the number is even it will be made up of $ characters. (Hint – look at the modulus operator to help you!)

***Sample outputs:***

Input a number between 1-10: 7

\* \* \* \*

\* \* \*

\* \*

\*

Provide a printout of properly formatted source code (your entire Java program).

Provide 2 example outputs/test cases: one that shows a printout of asterisks and one that shows a printout of $ characters.

**Question 3.** Write a Java application that plays a word game with the user. The program asks the user to enter the following:

* Your name
* One number between 1 and 10
* Your favorite sport
* Your hometown
* Your favorite movie
* Your favorite animal

Once the user enters these items, the program will display one of two stories depending on what number they entered. If the number they entered is less than 5 it will print the following by replacing the inputted variables into the correct locations:

THIS IS THE BEST STORY EVER

My name is <name>. And I'm from <hometown>.

My favorite sport is <sport>. I have a pet <animal>

who I take to watch my favorite movie <movie>.

The End!

If the number they entered is 5 or greater, it will print the following:

THIS IS THE BEST STORY EVER

My name is <name> and I am a <animal>. I live in <hometown> and love to watch <movie> while trying to play <sport>. It does not work out so well though.

The End!

Here is a sample run. Words in orange are user input from the keyboard.

Enter your name: Bob

Enter a number from 1 to 10: 7

Enter your favorite sport: hockey

Enter your hometown: Halifax

Enter your favorite movie: Star Wars

Enter your favorite animal: snake

THIS IS THE BEST STORY EVER

My name is Bob and I am a snake. I live in Halifax and love to watch Star Wars while trying to play hockey. It does not work out so well though.

The End!

Provide a printout of properly formatted source code (your entire Java program).

Provide 2 example output/test cases (to show both stories).

**Question 4.** Write a program that will calculate the cost of airline ticket for Air Canada. There is a special sale on flights for students and senior citizens. If a person is a student there is a 20% discount; and if a person is a senior citizen there is a 10% discount. If a person is neither a student nor a senior citizen, no discount applies to their ticket price.

Use a Scanner object to read in the regular price of an airline ticket plus the sales tax rate on the ticket (e.g., the HST rate), and find out if the person flying is a student or a senior citizen. You will apply the discount (if applicable) to the cost of the ticket BEFORE adding the tax. After you apply the discount, then apply the tax and print the total. See the sample below for proper formatting of the output. *Do not concern yourself with controlling the display of the decimal point.*

Sample 1:

Enter the price of the flight: $ 300

Enter the tax rate: % 10

Enter 1 for student, 2 for senior, or 3 for neither: 1

Discount on price of ticket: $60.0

Price of ticket (after discount): $240.0

Tax: $24.0

Total: $264.0

Sample 2:

Enter the price of the flight: $ 300

Enter the tax rate: % 10

Enter 1 for student, 2 for senior, or 3 for neither: 3

Discount on price of ticket: $0.0

Price of ticket (after discount): $300.0

Tax: $30.0

Total: $330.0

Provide a printout of properly formatted source code (your entire Java program).

Provide 3 example outputs/test cases different than above: one that shows a printout of the sale of ticket for a student, a senior and a person who is neither a student nor a senior.

**Question 5**. Create a Java program that asks the user to enter four numbers between 0-9, then checks to see how many pairs of numbers there are (in any order). There can be 0 pairs, 1 pair, or 2 pairs. Once a number is assigned to a pair, it cannot be used to form a different pair. For example:

If the user enters 0 1 0 1 the output would be 2 pair.

If the user enters 9 9 5 5 the output would be 2 pair.

If the user enters 9 9 9 9 the output would be 2 pair.

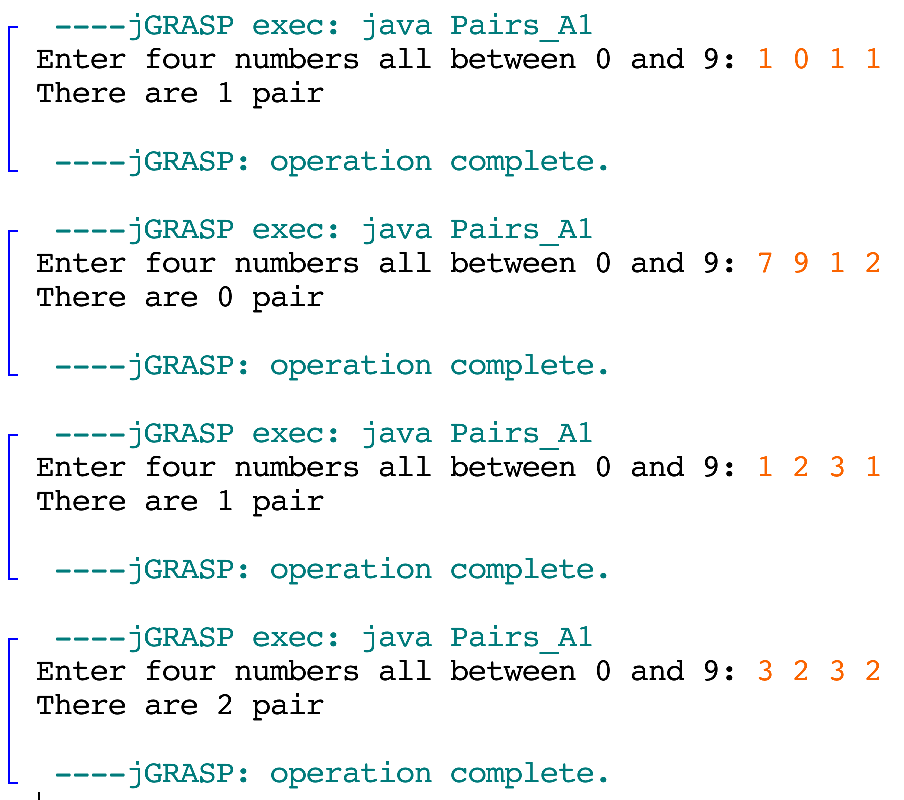
If the user enters 9 9 9 5 the output would be 1 pair.

If the user enters 3 2 1 3 the output would be 1 pair.

If the user enters 5 6 7 1 the output would be 0 pair.

If the user enters 1 0 1 1 the output would be 1 pair.

See below for a sample of runs.



Provide a printout of properly formatted source code (your entire Java program).

Provide 4 example outputs/test cases: showing all four possibilities – no pairs, 1 pair, 2 pairs and a case with 1 pair when three numbers match.

**Question 6.** Write a Java program that uses a Scanner object to read in three numbers and determines the smallest and largest numbers *without* using Java's Math Class.

Ask a user to enter three numbers. Then print the sum of the three numbers, the largest of the three numbers and the smallest of the three numbers. Finally, print all three numbers from largest to smallest. See the sample below for proper formatting of the output. *Do not concern yourself with controlling the display of the decimal point.* **You can assume all three numbers are different.**

Sample:

Enter three numbers: 22 10 30

The sum of 22.0, 10.0, and 30.0 is 62.0

The largest number is 30.0

The smallest number is 10.0

The numbers from largest to smallest are: 30.0, 22.0, and 10.0

Provide a printout of properly formatted source code (your entire Java program).

Provide 3 example outputs/test cases (different from above that shows all possible cases).