Lab Assignment 01



| **Course Code:** | **CSE111** |
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| **Course Title:** | **Programming Language II** |
| **Topic:** | **Input, Output, Operators, and Branching** |
| **Number of Tasks:** | **11** |

**Task 1**

Write the Java code for the following:

1. Declare an **integer** variable. Initialize it with some value of your choice and print it to check the value has been stored properly.
2. Declare and initialize another **integer** variable. Add this to the first one (without creating a new variable) and print out the result. Verify that the addition has been done correctly.
3. Now print the product and division of the two **integer** numbers.
4. Repeat exercises 1A, 1B, and 1C for variables of data type **double**. Verify your answers.
5. Repeat exercises 1A, 1B, and 1C for one **double** data type and one **integer** datatype. Verify your answers.
6. Repeat exercises 1A and 1B for variables of data type **String**. How does the addition operator work for Strings? What if the first variable is an integer and the second is a String and vice versa?
7. Repeat 1A and 1B for integers taken as inputs from the user.

**Task 2**

Write a Java program declaring two integer variables and initializing them. Your task is to swap the values of these two variables. You must complete it using two different approaches.

* By Creating a third variable.
* Without creating any other variables.

**Task 3**

Write a Java program that displays the 2 rightmost digits of your student ID in reverse order. For example, if your student id is 23221454, you need to print 4, and then 5.

| **Sample Input** | **Output** |
| --- | --- |
| 23221454 | 4  5 |

**Task 4**

Write a Java code to display the multiplication table for a positive integer 'n'. The table should include the products of 'n' with each of the numbers from 1 to 10. For example, if n = 5, your code should output:

5 x 1 = 5

5 x 2 = 10

5 x 3 = 15

...

5 x 10 = 50

*[You are not allowed to use loops to solve this problem.]*

**Task 5**

Write the Java code of a program to find the largest among three different numbers entered by the user.

| **Sample Input** | **Output** |
| --- | --- |
| 100  23  -4 | Largest number: 100 |
| 5  17  -5 | Largest number: 17 |

**Task 6**

Write a Java code that will take a year as input and print whether that year is a leap year or not.

* A year may be a leap year if it is evenly divisible by 4.
* Years that are divisible by 100 (century years such as 1900 or 2100) cannot be leap years unless they are also divisible by 400 (1600 or 2000).

| **Sample Input** | **Output** |
| --- | --- |
| 2020 | 2020 is a leap year |
| 2001 | 2001 is not a leap year |
| 1900 | 1900 is not a leap year |
| 2000 | 2000 is a leap year |

**Task 7**

Write a Java code of a program that takes an integer number as user input and then determines if that number is divisible by both 5 and 7; otherwise display “No”. For example, numbers like 35, 70, 105, 140, 175, 210, 245, 280 etc. can be divisible by both 5 and 7.

| **Sample Input** | **Output** |
| --- | --- |
| 15 | Invalid: Divisible by 5 Only |
| 28 | Invalid: Divisible by 7 Only |
| 105 | Divisible by Both |
| 36 | No |

**Task 8**

Write a Java Program, that takes in a BRACU student ID as integer, and prints out the year and the session the student enrolled in.

Hints:

* The first two digits denote the year the student got enrolled
* The 3rd digit denotes the session Student joined

(Spring→1, Summer→3, Fall→2)

| **Sample Input** | **Output** |
| --- | --- |
| 16101307 | Student Joined BRAC in Spring 16 |
| 19301307 | Student Joined BRAC in Summer 19 |
| 20201307 | Student Joined BRAC in Fall 20 |

**Task 9**

Write a Java program that takes the CGPA and no of credits completed by a student and prints whether the student is eligible for a waiver and of what percentage.

To be eligible for a waiver, a student must have completed at least 30 credits and earned a CGPA greater or equal to 3.8. If not, please print "The student is not eligible for a waiver".

| **CGPA** | **Waiver percentage** |
| --- | --- |
| 3.80 - 3.89 | 25 percent |
| 3.90 - 3.94 | 50 percent |
| 3.95 - 3.99 | 75 percent |
| 4.00 | 100 percent |

Now let’s look at the samples.

| **Sample Input** | **Output** |
| --- | --- |
| 3.93  78 | The student is eligible for a waiver of 50 percent |
| 3.79  24 | The student is not eligible for a waiver |

**Task 10**

Write the Java code of a program that takes an integer from the user, and prints the integer it is a multiple of **either 2 or 5 but not both.** If the number is a multiple of 2 and 5 both, then print "Multiple of 2 and 5 both". For all other numbers, the program prints "Not a multiple we want".

For example, 2, 4, 5, 6, 8, 12, 14, 15, 16, 18, 22 … i.e. this includes multiples of 2 only and multiples of 5 only, NOT multiples of 2 and 5 both or other numbers.

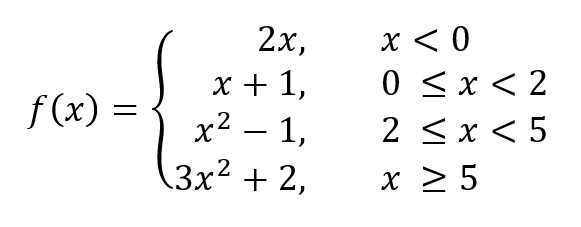
*hint(1): we may use the modulus (%) operator for checking the divisibility*

*hint(2): we can consider the number to be an integer*

| **Sample Input** | **Output** |
| --- | --- |
| 6 | 6 |
| 15 | 15 |
| 10 | Multiple of 2 and 5 both |
| 17 | Not a multiple we want |

**Task 11**

Let’s consider the following piecewise function:



Write a Java code of a program that takes the value of x as user input and then displays the output based on the given piecewise function.

| **Sample Input** | **Output** |
| --- | --- |
| -3 | -6 |
| 1 | 2 |
| 4 | 15 |
| 10 | 302 |