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Introduction to Computer Programming, Spring Term 2023
Practice Assignment 2

Discussion 04.03.2023 - 09.03.2023

Exercise 2-1 Java Expressions
To be discussed in Tutorial

a)
```
char c = 'a';
int x = c;
System.out.println(x);
x ++;
System.out.println(x);
char v = (char)x;
System.out.println(c);
System.out.println(v);
c ++;
System.out.println(c);
```

b)
```
String x = "CSEN";
int y = 202;
String z = x + y + "!";
System.out.println( z );
String u = y + x + "!";
System.out.println( u );
String v = y;
System.out.println( v );
String m = "204";
int o = m;
System.out.println( o );
```

Exercise 2-2 Code Refactoring
To be discussed in the Tutorial

Refactor each of the following program fragments (if possible)

- `Program 1`

```
if (x > y)
    System.out.println("Good Day");
else {
    System.out.println("x is less than or equal to y");
    System.out.println("Good Day");
}
```

- `Program 2`

```
if (x == 0) {
    System.out.println("x is even");
    System.out.println(x);
}
if (x%2 == 0) {
    System.out.println("x is even");
    System.out.println(x);
}
if (x == 1) {
    System.out.println("x is odd");
    System.out.println(x);
}
if (x%2 != 0) {
    System.out.println("x is odd");
    System.out.println(x);
}
```

Exercise 2-3

To be discussed in Tutorial

Write a java program that reads a number (product) from the user and checks if the number is divisible by 7 and prints the multiples of that number. If the user enters a negative number, print `"Try again."` Use conditional operators only.

```
Example 1:
Enter a number: 15
15 is not divisible by 7.

Example 2:
Enter a number: 35
This is the product of 7*5.

Example 3:
Enter a number: -2
Try again.
```

Exercise 2-4 Calculator

To be discussed in the Tutorial

Write a Java program that designs a simple calculator. The program should read two rational numbers and a character that indicates the type of operation desired. Those operations include addition, subtraction, multiplication, division and calculating remainder. **Solve with if statement.**

Exercise 2-5 Maximum

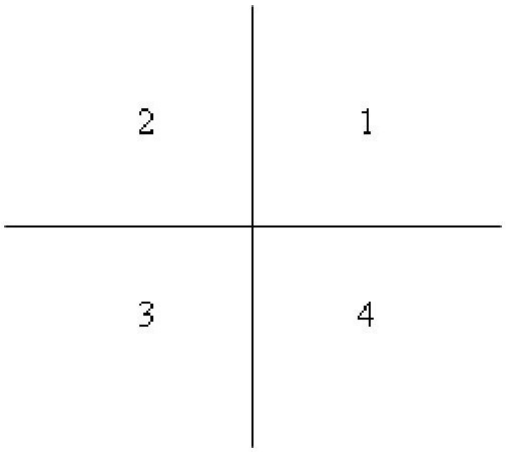
To be discussed in the Tutorial

Write a Java program to calculate the maximum of three numbers. **Solve using conditional operator only.**

Exercise 2-6 Cartesian Plane

To be solved in Lab

Write a Java program that reads the x-y coordinates of a point in the Cartesian plane and displays a message telling the user the quadrant in which the point is located or the axis on which the point lies.



Exercise 2-7 Minimum
To be solved in the Lab

Write a Java program to calculate the minimum of three numbers. **Solve using conditional operator only.**

Exercise 2-8 Quadratic Equation
To be solved in lab

Write a Java program that reads from the user three double numbers a, b, c representing the coefficients of a quadratic equation $ax^2+bx+c=0$. The program should calculate the roots of the quadratic equation using the following formulae:
$x_1 = \frac{-b+\sqrt{(b^2-4ac)}}{2a}$
$x_2 = \frac{-b-\sqrt{(b^2-4ac)}}{2a}$
If $a = 0$ or if $b^2 - 4ac < 0$ the output of the program should be: No Solutions !

Exercise 2-9 Tire's Pressure
To be solved in Lab

Write a program that reads in the pressure of the four tires and writes a message that says if the inflation is OK or not. Tires don't have to have exactly the same pressure. The front tires can be within 3 psi of each other, and the rear tires can be within 3 psi of each other. You must make sure that each tire has a pressure between 35 and 45.

```
Input right front pressure : 35
Input left front pressure : 37
Input right rear pressure : 41
Input left rear pressure : 44
Inflation is OK
```