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Introduction to Computer Programming, Spring Term 2017
Practice Assignment 2

Discussion 25.2.2017 - 2.3.2017

Exercise 2-1 To be discussed in the tutorial
Code Refactoring

Refactor each of the following program fragments (if possible)

- Program 1

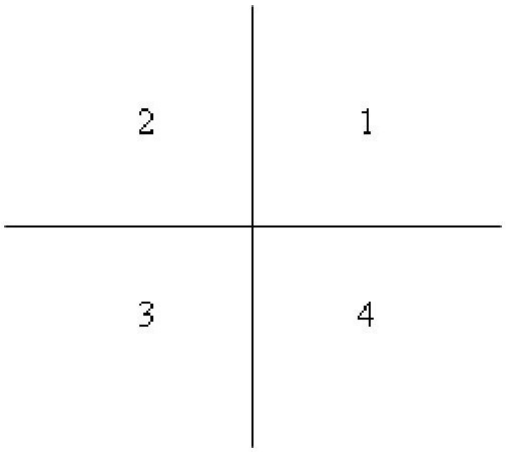
```
if (x > y)
    System.out.println("Good Day");
else {
    System.out.println("x is less than or equal to y");
    System.out.println("Good Day");}
```

- 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 2-2
Cartesian Plane

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 2-3

Score

A sequence of six tests, all scored out of 100, are to be given different weightings in determining a final mark. Write a Java program that computes the appropriate weighted score for one test. The fragment should first read values of testNumber and score. Using a switch statement, it should then compute and print the appropriate value of weightedScore using the weightings given in the following table.

Test Number	Weight
1	10%
2	20 %
3	20 %
4	15%
5	15%
6	20%

Exercise 2-4 To be discussed in the Tutorial

Maximum

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

Exercise 2-5 To be discussed in the tutorial

Months

Write a Java program that prints the number of days for any given month.

```
Please enter the month number (1-12): 5
31 days.
```

Exercise 2-6

Quadratic Equation

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 2-7 To be discussed in the lab
Calculator

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 using switch statement only.**

Exercise 2-8 To be discussed in the lab
Zodiac

Write a Java program that requests a month number (1-12) and a day number (1-31). The program should print the Zodiac Sign according to the user's input.

Sign	From	To
Capricorn	December 22	January 19
Aquarius	January 20	February 17
Pisces	February 18	March 19
Aries	March 20	April 19
Taurus	April 20	May 20
Gemini	May 21	June 20
Cancer	June 21	July 22
Leo	July 23	August 22
Virgo	August 23	September 22
Libra	September 23	October 22
Scorpio	October 23	November 21
Sagittarius	November 22	December 21

Exercise 2-9
Tire's Pressure

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
```