CIS016-1 - Principles of Programming / CIS096-1 – Principles of Programming and Data Structures / PAT001-1 – Principles of Programming - 2019/2020
Exercise Sheet 2

This exercise sheet is related to the Week 2 lecture, so please consult the lecture notes when attempting the exercises. Please also download the example code. All can be found on BREO under "Guided Learning → Week 2".

Exercise 1 e Notation

Write a program that calculates 0.0000342 / 2345. Explain what the output means!

Exercise 2 Commenting and Understanding Code

One way of learning a programming language is by analysing existing code and figuring out what it does.

On page 3 you see the class **`SecretClass.`** Your task is to analyse and understand the code, and comment it. So please fill or complete the comments in the source code. Your comments should reflect what the code actually does, what it prints (if appropriate), etc. From your comments it has to become clear what each line of code does when executed! Feel free to execute the code to investigate it.

Note: **`SecretClass.java`** is also available on BREO (in the Week 2 example code package), so you don't have to copy and paste or type it in again.

Exercise 3 Conversion

Write a program to convert

- 23 kilometres to miles and
- 17 miles to kilometres.

Your program should print the results. Use the following conversions:

- 1 mile is 1.609 kilometres.
- 1 kilometre is 0.621 miles.

Exercise 4 Conversion and Division

Write a program to convert 22 square metres into square kilometres and print the result.

Note: Divide square metres by 1 million to produce square kilometres.

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Note also that the answer is not zero!

Hint: Have a look at the lecture notes and the code examples. What do they tell you what happens when you try to divide two integer variables? What do you have to do that the result is not zero?

Exercise 5 Circle

Write a program to calculate the circumference of a circle, its area and the volume of a sphere.

Display the radius and the results in a clear format.

Use the following information.:

- double radius = 7.5;
- final static double PI = 3.142857; (PI as a constant)
- circumference = 2 * PI * radius
- area = PI * radius^2 (the square of the radius, or radius * radius)
- volume = 4 * PI * radius cubed and divided by 3

Exercise 6 Odd or even?

Use the modulo operator to find out if 17 is odd or even.

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SecretClass for Exercise 2

```
/*
 * Please fill or complete the comments of this class so that
 * they reflect what their subsequent line(s) are doing
 */
public class SecretClass {

// ...
static final double PI = 3.141592653589793;


/*
 * The purpose of the main() method is …
 */
public static void main(String args[]) {
        // ...
        System.out.println("Java is cool!");


        // ...
        System.out.println(2 + 3);


        // ...
        System.out.println("2" + (2 + 2));


        /*
         * The next two lines...
         */
        String str = "PI = ";
        System.out.println(str + PI);


        // ...
        double piSquare = PI * PI;


        // ...
        System.out.println("The square of PI is " + piSquare);


        // ...
        double fakePI = piSquare/2;
```

```
        // ...
        boolean checkPI = (PI == fakePI);


        // ...
        System.out.println("PI and the fake PI are equal. " +
                           " This statement is " + checkPI + ".");


        /*
         * The next 3 lines...
         */
        fakePI = 3.141592653589793;
        checkPI = (PI == fakePI);
        System.out.println("PI and the fake PI are equal. " +
                           " Now this statement is " + checkPI + ".");


        // ...
        System.out.println("Hussain".equals("Fred"));
    }
}
```