If-else statements, Arrays & Loops

Goals

Creating simple programs to get familiar with if/else statements, arrays and loops.

Assignments

Assignment 1

Learning goal: use of if/else statement.

NOTE: If you also did the previous homework, you can use the `Door` class from there as a starting point, and skip the duplicate steps.

1. Create a class `Door`
2. The `Door` has three properties: `width`, `height`, and `open` (boolean)
3. Make a method `openDoor` which sets `open` to `true`. Also, print a message "Opening door".
4. Make a method `closeDoor` which sets `open` to `false`. Also, print a message "Closing door".
5. Make a method `printOpen` which prints `The door is open` if the door is open and `The door is closed` if the door is closed.
6. Make a method `calculateSurface` which calculates the surface of the door (`width * height`).
7. Make a door, open it, close it, print the open state and print the surface.

Assignment 2

Learning goals: OOP (multiple objects and their interaction), use of if/else statement

1. Make a class `Zoo`
2. Make a class `Person` with a `name` and an `age`.
3. Make a method inside the `Zoo` class which calculates the ticket price (`int`) based on a `Person`'s age. (e.g. `public int calculatePrice(Person person){...}`). The method should return 0 if the age of the person is smaller than or equal to 5, 5 if the age of the person is smaller than or equal to 12, and 15 if the age of the person is more than 12.
4. In your main method, create 3 persons that fall in the range we discussed (e.g. 1 age 3, 1 of age 10 and one of age 63), then make one `Zoo` object and print the ticket prices for all three persons using it.

Assignment 3

Learning goals: Arrays / Loops

1. Make an array of `int`s, with name `numbers`. Create it with length 5.
2. Now, set the values of the array to 1, 2, 3, 4, 5.
3. print the numbers inside the array using two different kinds of for-loops:
    1. for-each loop (`for(int number : numbers) {...}`)
    2. regular for-loop:

```
for(int i = 0; i < numbers.length; i++) {
    int number = numbers[i];
    ...
}
```

4. Now, to practice more with loops, instead of setting the values manually as you did in step 2, set the values using a for loop. Use a regular for-loop that loops starting from 0 until 5, setting the *value* of the `numbers` array to `i + 1`.
5. Run your program again to see whether you succeeded.

Assignment 4

Learning goals: Loop in a loop

Create a method that contains a loop in a loop:

```
public void printPyramid(int size) {
    for(int i = 0; i < size; i++) {
        for(int j = 0; j < ...; j++) {

            ....

        }
    }
}
```

Calling the method `printPyramid(5)` should print the following output:

```
+
++
+++
++++
+++++
```

Hint: use `System.out.print()` in combination with `System.out.println()` to be able to print a `+` without a new line.

Test your method by calling the `printPyramid` method with 5, and if it works, play around with it a little (increase the numbers a bit and see what happens, for example).