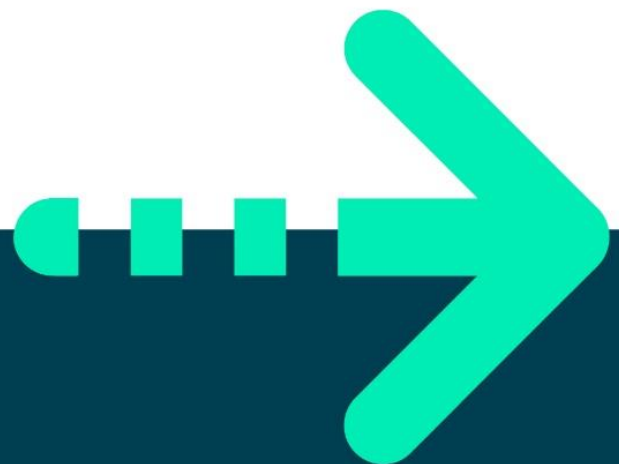




## **Lab 6: Loops**

# **Java Fundamentals**





# Lab 6: Loops

## Objective

In this lab you'll practise using various looping constructs.

## Part 1 – Calculating the grades for 5 students

### Step by step

1. Back in the **labs** project which you created in **Lab 1**, add a new package called **lab06**.
2. Create a new class called **Program** in this package with a `main()` method.
3. Add a class called **Lab6** (with no main method).
4. Copy the code for **getInt()** which you wrote in Lab6.
5. Create a method in Lab6 called **part1()**:

```
public void part1() {  
}
```

6. Create an instance of Lab6 in the `main()` and call the `grades()` method to get ready for the rest of this exercise.

```
Lab6 lab6 = new Lab6();  
lab6.part1();
```

7. From now on, all your code will go in the `part1()` method. We will revisit the `grades()` method that you wrote in Lab5, but this time we will process many students rather than just one grade.
8. Copy the code for processing `grades()` to the Lab6 class.
9. Call `grades()` from the `part1()` method.
10. Create an array of 5 names called 'names' at the start of the `grades()` method.

**Tip:** View slides for code.

11. Create an array of 5 integers called **marks** to hold the marks for our 5 students.
12. Create a loop (while or for) to:
  - a. get a student name and store it in the **names** array.
  - b. get the grade for the student and store it in the **marks[]**.
13. Having stored the names of the students and their grades, create another loop to display each name, the *grade*, *mark* and *grade* (pass/merit...)



## Part 2 – How long does it take to double your money?

Assuming an initial investment of say £100, how many years does it take to grow to £200 given an interest rate of 5%?

### Step by step

1. Create a new method in `account()` in the Lab6 class.
2. Create suitable variables to store the initial money, current money (at the end of each year), interest rate (5%), and years (to double the money).
3. Write code to calculate the number of years it takes to get £200.

**Tip:** Use a while loop which stops when the current money = £200



### Part 3 – Nested Loop Practice

Ensure you can code up nested loops, understanding the full sequence in which everything runs and use the outer and 'inner' loop variables together in a nested loop. In this section you'll produce a multiplication table.

#### Step by step

1. Create a method called `multiplicationTable()` in the `Lab6` class.
2. We want you to produce this output on the console.

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

**Tip:** Two nested for loops (from 1...10) are best for this.

To print the product of two variables called `row` and `col` in 5 spaces, use a statement like:

```
System.out.printf("%5d", col * row);
```

**\*\* End \*\***

