

# Introductory Java Programming

Course Code: EBU4201

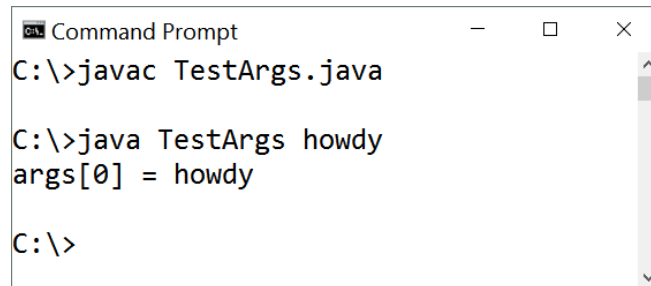
## Lab Sheet 1: Java Basics

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1. In a Java application's **main()** method, **String[] args** indicates that this method can take in one or more **String** parameters. Consider the following Java program:

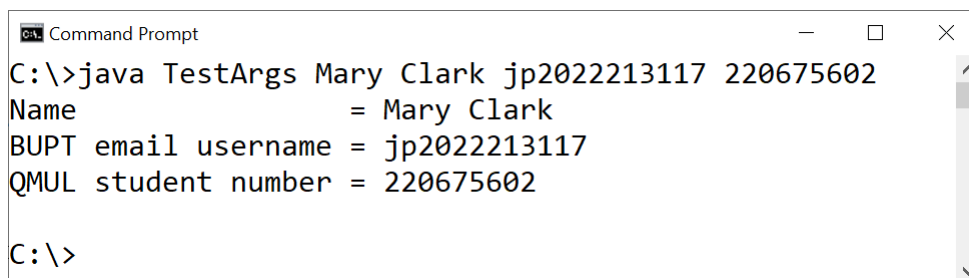
```
public class TestArgs {  
    public static void main(String[] args) {  
        System.out.println("args[0] = " + args[0]);  
    }  
}
```

This program outputs the following when called with **java TestArgs howdy**:



```
Command Prompt  
C:\>javac TestArgs.java  
  
C:\>java TestArgs howdy  
args[0] = howdy  
  
C:\>
```

- i) Modify the file **TestArgs.java** so that, when called with **java TestArgs Mary Clark jp2021213117 210675602** it outputs:



```
Command Prompt  
C:\>java TestArgs Mary Clark jp2022213117 220675602  
Name = Mary Clark  
BUPT email username = jp2022213117  
QMUL student number = 220675602  
  
C:\>
```

Your program file should be named **TestArgs.java**.

- ii) Call the program you just wrote, **TestArgs.java**, with your own student details.
- iii) What happens if you omit your student number in the program call in *part ii*)? For example, call the program with: **java TestArgs Mary Clark m.clark**. Try this with your student details. Why do you think you got the results you did?

2. Write a Java program called **WeekDayConverter** that reads an integer value between **1** and **7** from the command line and prints out the corresponding day of the week. You may use either **if...else** statements or a **switch** statement. The following line of code will convert the **String** value read from the command line to an integer:

```
int weekDay = Integer.parseInt(args[0]);
```

Therefore, calling the program as follows:

```
java WeekDayConverter 4
```

will output:

```
The 4th day of the week is Thursday.
```

3. Write a program to calculate your BMI and give weight status. Body Mass Index (BMI) is an internationally used measurement to check if you have a healthy weight for your height. The metric BMI formula accepts weight in kilograms and height in metres, as follows:

$$\text{BMI} = \text{weight (kg)} / \text{height}^2 (\text{m}^2)$$

BMI Weight Status categories' table:

| BMI range – kg/m <sup>2</sup> | Category    |
|-------------------------------|-------------|
| < 18.5                        | Underweight |
| 18.5 – 24.9                   | Normal      |
| 25 – 29.9                     | Overweight  |
| ≥ 30                          | Obese       |

Use the command line arguments to give weight in kilograms and height in centimetres. For example:

```
java BMICalculator 80 175
```

should output:

```
Your weight: 80 kg
Your height: 1.75 m
Your BMI: 26.12
You are in the Overweight range.
```

**Hint:** The data you read from the command line argument is of type **String**, and to convert a **String** to an **int**, you must use the **Integer.parseInt()** method; e.g.

```
int anInt = Integer.parseInt(aString);
```

4. Below is a Java program that uses a **while** loop:

```
/**
 * DoublingNumbers: Demonstration of while loop.
 */
public class DoublingNumbers {
    public static void main(String[] args) {
        int i = 1;
        while (i <= 10) {
            System.out.println("The double of " + i + " is " + 2*i);
            i++;
        }
    }
}
```

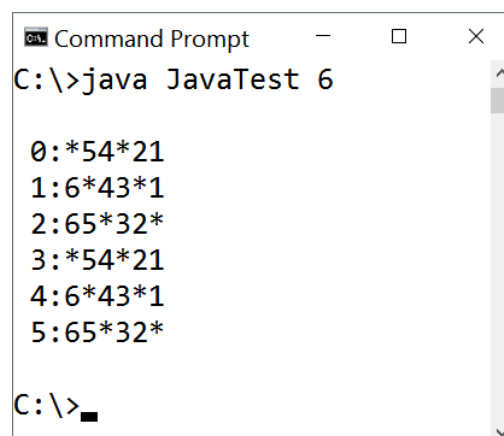
- Write another version of the program above using a **do-while** loop and name its file **DoublingNumbers\_v1.java**.
- Write one more version of the program above using a **for** loop and name its file **DoublingNumbers\_v2.java**.

**Note:** The THREE programs must generate the same output.

5. A working Java program has been mixed up (like fridge magnets), as below:

|                                     |  |   |
|-------------------------------------|--|---|
| else                                | }  | public class JavaTest {<br>public static void main(String[] args) { |
| System.out.print("*");              | int loopUntil = Integer.parseInt(args[0]); |   |
| if (((i + j) % 3) == 0)             | System.out.println();                      |   |
| System.out.println();               | System.out.print(":");                     | }   |
| for (int i=0; i < loopUntil; i++) { | }  | System.out.print(" " + i);  |
| for (int j=loopUntil; j > 0; j--) { | System.out.print(j);                       |   |

Rearrange all the pieces above to create a working Java program that outputs the following:



```
Command Prompt
C:\>java JavaTest 6

0:*54*21
1:6*43*1
2:65*32*
3:*54*21
4:6*43*1
5:65*32*

C:\>
```

**\*\* END of Lab Sheet 1: Java Basics \*\***