Introductory Java Programming

Queen Mary University of London
School of Electronic Engineering and Computer Science

Course Code: EBU4201

Lab Sheet 1: Java Basics

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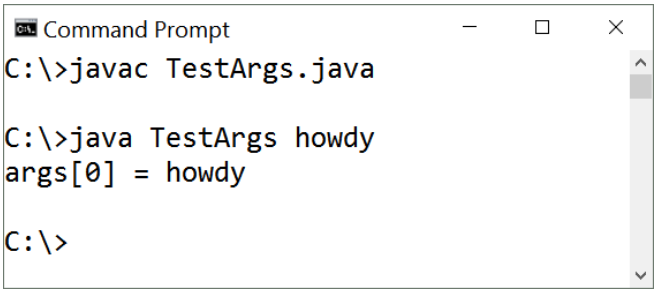
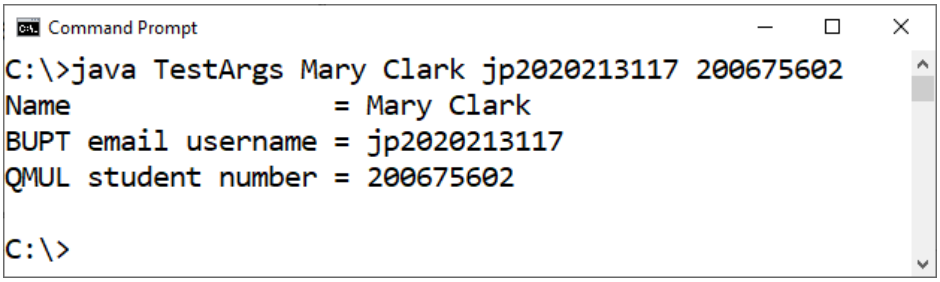
1. In a Java application's **`main()`** method, **`String[] args`** indicates that this method can take in one or more **`String`** parameters. Consider the following Java program:

```
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`**:



i) Modify the file **`TestArgs.java`** so that, when called with
`java TestArgs Mary Clark jp2020213117 200675602` it outputs:



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:

$$BMI = weight(kg)/height^2(m^2)$$

BMI Weight Status categories' table:

BMI range – kg/m^2	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++;
      }
   }
}
```

   i) Write another version of the program above using a **`do-while`** loop and name its file **`DoublingNumbers_v1.java`**.

   ii) 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 {
    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 ****