Basic Programming Practicum Job Sheet 10

From:

AL AZHAR RIZQI RIFA'I FIRDAUS

Class:

1 I

Absence:

01

Major:

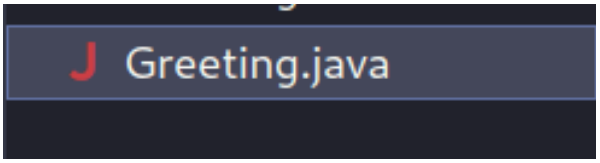
Information Technology

Study Program:

Informatic Engineering

Experiment 1

1. Create a new project



2. Create a new class, name it Greeting

```
1  public class Greeting {
2
3  }
```

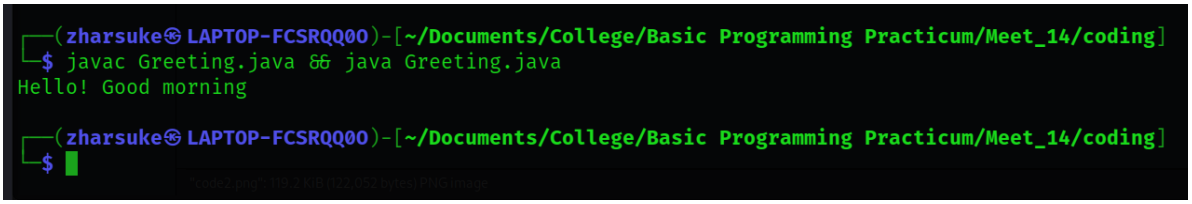
3. Create a function called giveGreeting inside the class

```
1  public class Greeting {
2
3      static void giveGreeting() {
4          System.out.println("Hello! Good morning");
5      }
6
7  }
```

4. Create a main function inside the class, and execute the giveGreetingfunction from within the main function.

```java
public class Greeting {

    static void giveGreeting() {
        System.out.println("Hello! Good morning");
    }

    public static void main(String[] args) {
        giveGreeting();
    }

}
```

5. Compile and run the program



Experiment 2

1. Using the class that was created in Experiment 1, add functioncalledsaySomething inside the Greeting class

```java
public class Greeting {

    static void giveGreeting() {
        System.out.println("Hello! Good morning");
    }

    static void saySomething(String expression) {
        System.out.println(expression);
    }

    public static void main(String[] args) {
        giveGreeting();
    }

}
```

2. Execute the saySomething function from inside the main function

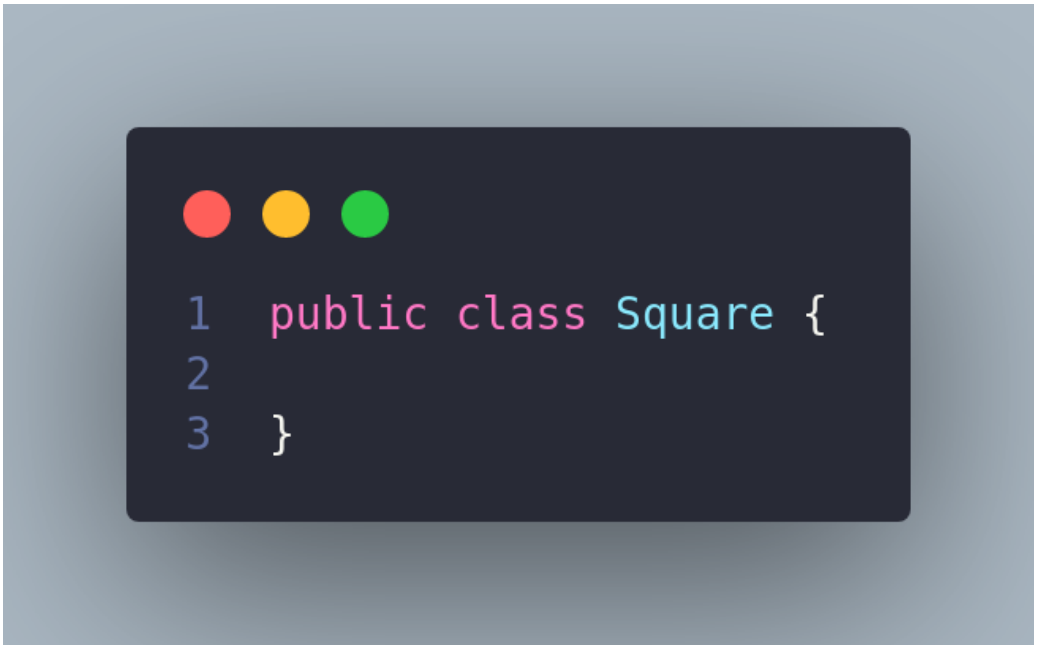
```java
public class Greeting {

    static void giveGreeting() {
        System.out.println("Hello! Good morning");
    }

    static void saySomething(String expression) {
        System.out.println(expression);
    }

    public static void main(String[] args) {
        giveGreeting();
        String exp = "Welcome to Java Programming";
        saySomething(exp);
    }

}
```

3. Compile and run the program

```
┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac Greeting.java && java Greeting.java
Hello! Good morning
Welcome to Java Programming

┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

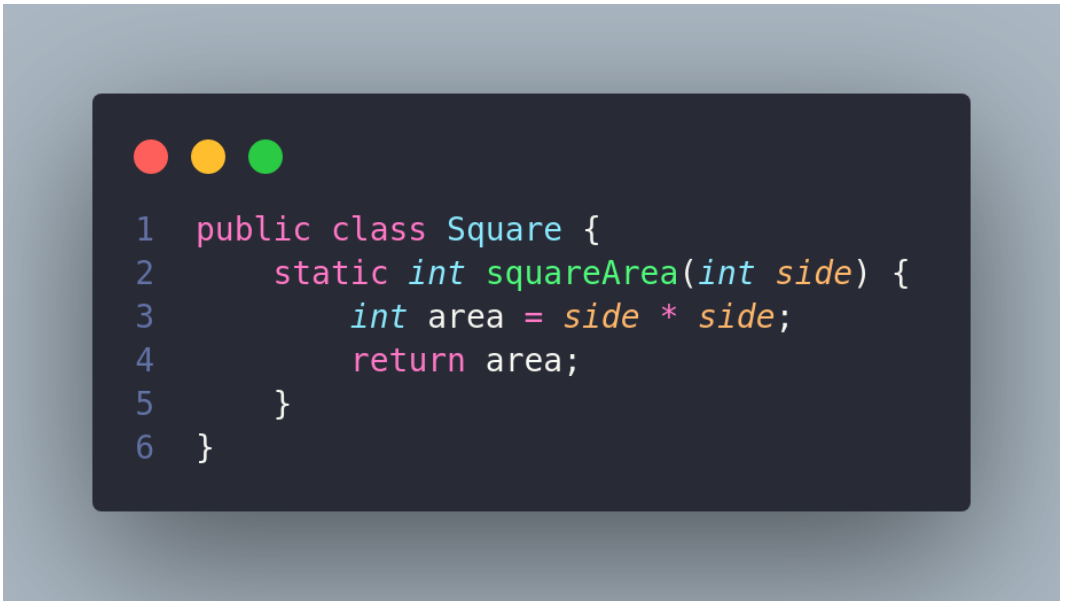
Experiment 3

1. Create a new class, name it Square



```
1  public class Square {
2
3  }
```

2. Create a function named squareArea inside that class which returns the value area (int), with the input parameter side (int)



```
1  public class Square {
2      static int squareArea(int side) {
3          int area = side * side;
4          return area;
5      }
6  }
```

3. Create a main function inside the class, and execute the squareArea function from within the main function.

```java
public class Square {
    static int squareArea(int side) {
        int area = side * side;
        return area;
    }

    public static void main(String[] args) {
        int a = squareArea(5);
        System.out.println("Area of square with side = 5 is " + a);
    }
}
```

4. Compile and run the program

```
┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac Square.java && java Square.java
Area of square with side = 5 is 25

┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

Experiment 4

1. Create a new class, name it ArithmeticOperation

```java
public class ArithmeticOperation {

}
```

2. Create a function named multiplication inside that class which returnsthevalue H (int) and input parameters C and D (int)

```java
public class ArithmeticOperation {
    static int multiplication(int C, int D) {
        int H;
        H = (C + 10) % (D + 19);
        return H;
    }
}
```

3. Create a function called subtraction inside that class which returns thevalueX (int) and input parameters A and B (int) and calls the multiplication function.

```java
public class ArithmeticOperation {
    static int multiplication(int C, int D) {
        int H;
        H = (C + 10) % (D + 19);
        return H;
    }

    static int subtraction(int A, int B) {
        int X;
        A = A + 7;
        B = B + 4;
        X = multiplication(A, B);
        return X;
    }
}
```

4. Create a main function inside the class, and execute the substraction function from within the main function. Don’t forget to add the Scanner library.

```java
import java.util.*;

public class ArithmeticOperation {
    static int multiplication(int C, int D) {
        int H;
        H = (C + 10) % (D + 19);
        return H;
    }

    static int subtraction(int A, int B) {
        int X;
        A = A + 7;
        B = B + 4;
        X = multiplication(A, B);
        return X;
    }

    public static void main(String[] args) {
        int value1, value2;
        Scanner input = new Scanner(System.in);
        System.out.print("Input value 1 : ");
        value1 = input.nextInt();
        System.out.print("Input value 2 : ");
        value2 = input.nextInt();
        int result = subtraction(value1, value2);
        System.out.println("The result is " + result);
    }
}
```

5. Compile and run the program.

```
┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac ArithmeticOperation.java && java ArithmeticOperation.java
Input value 1 : 2
Input value 2 : 4
The result is 19

┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

Experiment 5

1. Create a new class, name it MultiParameter

```java
public class MultiParameter {

}
```

2. Create a function called Print (void) inside the class using two types of parameter data, namely String and int.

```java
public class MultiParameter {
    static void Print(String str, int... a) {
        System.out.println("String : " + str);
        System.out.println("Number of parameters : " + a.length);
        for (int i : a) {
            System.out.print(i + " ");
        }
        System.out.println("");
    }
}
```

3. Create a main function inside the class, and execute the Print function from within the main function.

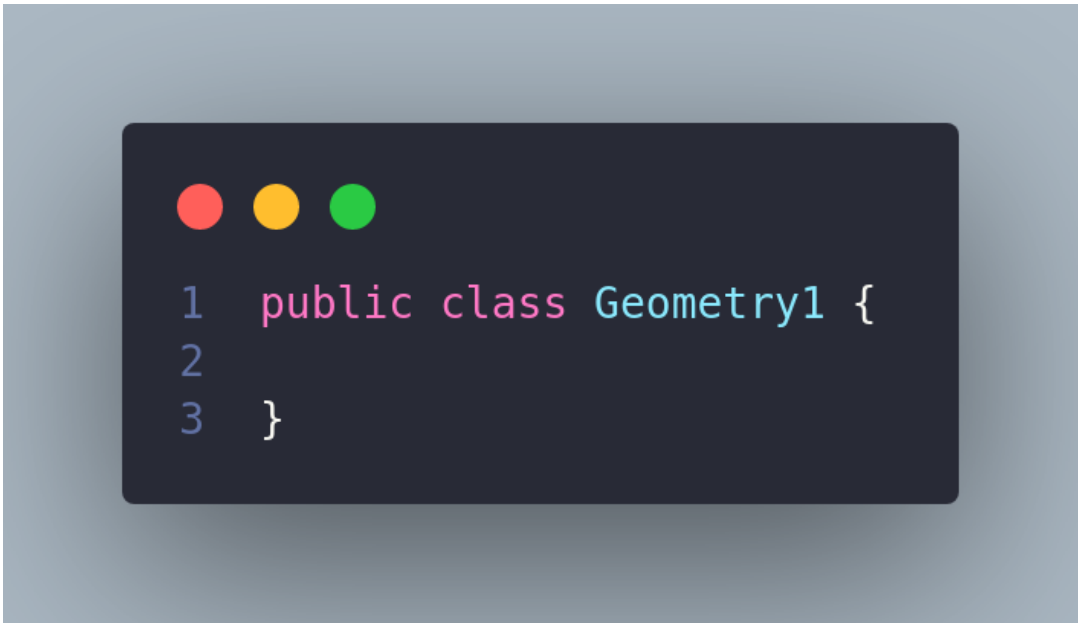
```java
public static void main(String[] args) {
    Print("Basic Programming", 85, 90);
    Print("Information Technology", 1, 2, 3, 4, 5);
    Print("Politeknik Negeri Malang");
}
```

6. Compile and run the program.

```
┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac MultiParameter.java && java MultiParameter.java
String : Basic Programming
Number of parameters : 2
85 90
String : Information Technology
Number of parameters : 5
1 2 3 4 5
String : Politeknik Negeri Malang
Number of parameters : 0


┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

Experiment 6

1. Create a new class, name it Geometry1



2. Create a program to calculate the area of a rectangle and volume of blocks without using functions

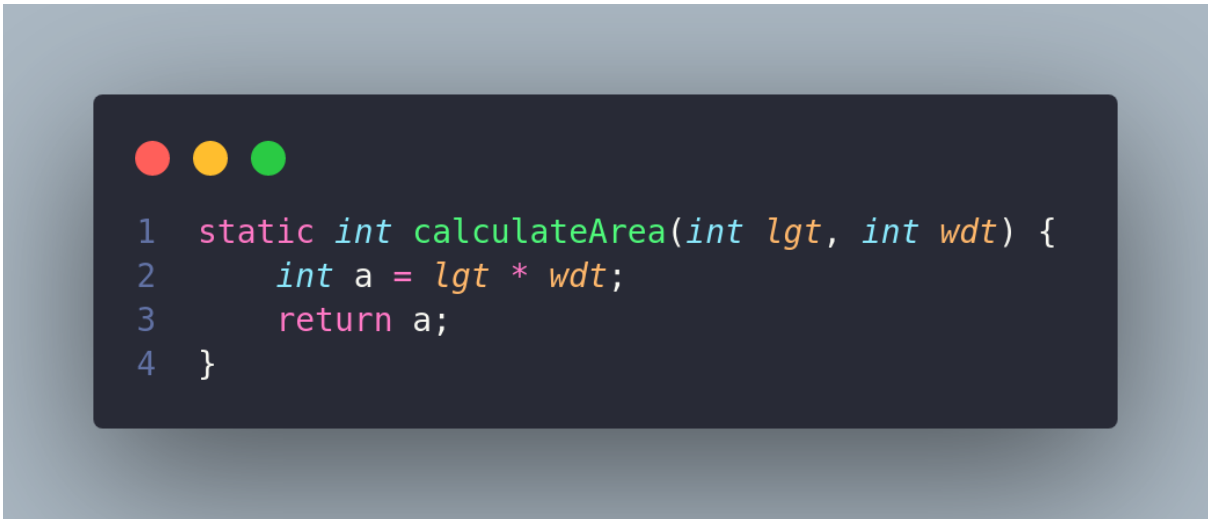
```java
import java.util.Scanner;

public class Geometry1 {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
        int length, width, height, area, volume;
        System.out.print("Enter a length value : ");
        length = input.nextInt();
        System.out.print("Enter a width value : ");
        width = input.nextInt();
        System.out.print("Enter a height value : ");
        height = input.nextInt();
        area = length * width;
        System.out.print("Area of a rectangle is " + area);
        volume = length * width * height;
        System.out.print("Volume of block is " + volume);

    }
}
```

3. Create another new class, name it Geometry2

```java
public class Geometry2 {

}
```

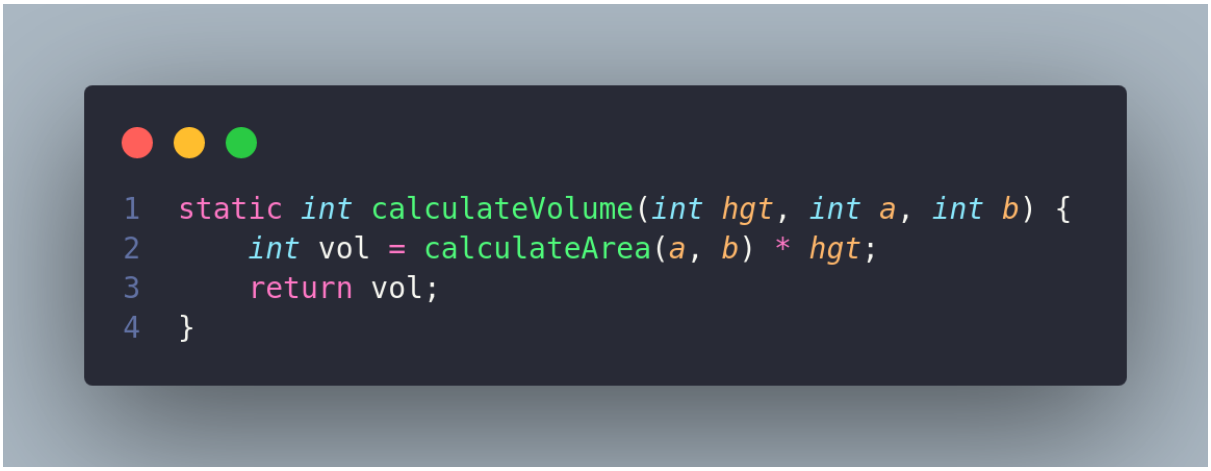
4. Geometry2 contains the program code for calculating the area of a rectangleand the volume of a block by using a function, so that there arethreefunctions, namely calculateArea, calculateVolume, and the main function

calculateArea function



```
1  static int calculateArea(int lgt, int wdt) {
2      int a = lgt * wdt;
3      return a;
4  }
```

calculateVolume function



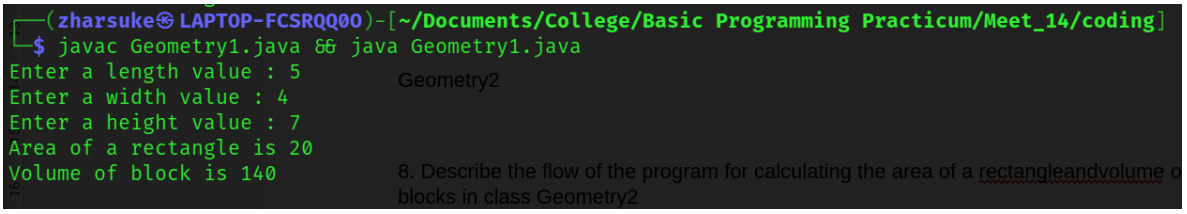
```
1  static int calculateVolume(int hgt, int a, int b) {
2      int vol = calculateArea(a, b) * hgt;
3      return vol;
4  }
```

main function

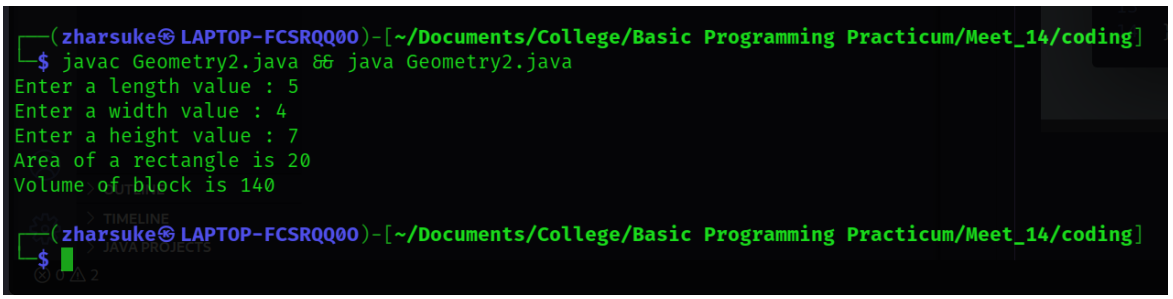
```java
public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    int length, width, height, area, volume;
    System.out.print("Enter a length value : ");
    length = input.nextInt();
    System.out.print("Enter a width value : ");
    width = input.nextInt();
    System.out.print("Enter a height value : ");
    height = input.nextInt();
    area = calculateArea(length, width);
    System.out.println("Area of a rectangle is " + area);
    volume = calculateVolume(height, length, width);
    System.out.println("Volume of block is " + volume);
}
```

7. Compile and run the two programs (class Geometry1 and Geometry2)

Geometry1



Geometry2



8. Describe the flow of the program for calculating the area of a rectangle and volume of blocks in class Geometry2

In the calculateArea function there are 2 parameters, int lgt and wdt. Then the function returns an int variable a which contains lgt * wdt.

In the calculateVolume function, there are 3 parameters which are int hgt, int a, int b. Then the function returns an int volume that contains the calculateArea function with parameters a, b then * hgt.

Questions!

1. Based on Experiments 2 and 3, explain when a function requires a returnvalue!

2. In Experiment 4, add a function that is used to ensure that the value1 and value2 are at least 0, then call that function in the main!

3. Explain why the parameter entries in Experiment 5 are written with int ... a!

4. What is the output of the program below, then explain the flow of the program!

Answer

1. A function requires a return when the parameters in the function produce a result.
2. Code :

```java
import java.util.*;

public class ArithmeticOperation {
    static int multiplication(int C, int D) {
        int H;
        H = (C + 10) % (D + 19);
        return H;
    }

    static int subtraction(int A, int B) {
        int X;
        A = A + 7;
        B = B + 4;
        X = multiplication(A, B);
        return X;
    }

    static void checkMin(int value1, int value2) {
        if (value1 < 0) {
            value1 = 0;
            System.out.println("Minimal value 1 is 0 !");
            System.exit(0);
        } else if (value2 < 0) {
            value2 = 0;
            System.out.println("Minimal value 2 is 0 !");
            System.exit(0);
        }
    }

    public static void main(String[] args) {
        int value1, value2;
        Scanner input = new Scanner(System.in);
        System.out.print("Input value 1 : ");
        value1 = input.nextInt();
        System.out.print("Input value 2 : ");
        value2 = input.nextInt();
        checkMin(value1, value2);
        int result = subtraction(value1, value2);
        System.out.println("The result is " + result);
        input.close();
    }
}
```

Result :

```
┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac ArithmeticOperation.java && java ArithmeticOperation.java
Input value 1 : -1
Input value 2 : 9
Minimal value 1 is 0 !

┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac ArithmeticOperation.java && java ArithmeticOperation.java
Input value 1 : 5
Input value 2 : -2
Minimal value 2 is 0 !

┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac ArithmeticOperation.java && java ArithmeticOperation.java
Input value 1 : 5
Input value 2 : 6
The result is 22

┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

3. int… a means collection from data in one variable same with array but int…a only use in parameter function.
4. Code :

```java
public class MyProgram {
    static void printUntil(int i) {
        for (int j = 0; j < i; j++) {
            System.out.print(j);
        }
    }
    static int total(int num1, int num2) {
        return (num1 + num2);
    }
    static void printTotal(int num1, int num2) {
        printUntil(total(num1, num2));
    }
    public static void main(String[] args) {
        int temp = total(1, 1);
        printTotal(temp, 5);
    }
}
```

Result :

```
┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac MyProgram.java && java MyProgram.java
0123456
┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

Inside the main function there is an int temp that contains a total function whose parameters contain 1 and 1. Then call the printTotal function whose parameter contents are temp and 5. In the printTotal function there are 2 parameters num1 and num2 and then call the printUntil function whose parameters contain the total function with the parameters num1 and num2. In the function total returns the sum between num1 and num2. In the printUntil function there is 1 parameter int i. i is 7. 7 is obtained from the total function 1 + 1 = 2 which is stored in int temp. Then printTotal with temp which is 2, plus 5. In the printUntil function there is a loop from 0 to 7 which produces an output of 0123456.

Assignment

1. Create a static method called Max3 (int bil1, int bil2, int bil3) which takes three integer parameters and returns an integer number which is the maximum value among the three numbers. Note: You can create other static methods besides Max3. After that, call the Max3 static method in your main method.

2. Create a class called Circle in which there is a function to calculate the circumference of a circle and the area of a circle.

3. Create a program to fill array B with the data type int (10 students' test scores), where the input and filling process into the array is carried out in a function. Next, create another function to calculate the average value of the array (the average score of student tests). Print the average value, with the instructions for printing in the main function.

Answer

1. Code :

```java
import java.util.*;

public class ass1 {

    static int Max3(int num1, int num2, int num3) {
        int maxNum = 0;
        if (num1 > num2 && num1 > num3) {
            maxNum = num1;
            System.out.println("The Largest number = " + maxNum);
        } else if (num2 > num3) {
            maxNum = num2;
            System.out.println("The largest number = " + maxNum);
        } else {
            maxNum = num3;
            System.out.println("The largest number = " + num3);
        }
        return maxNum;
    }

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        int num1, num2, num3;

        System.out.print("Insert number 1 : ");
        num1 = scanner.nextInt();
        System.out.print("Insert number 2 : ");
        num2 = scanner.nextInt();
        System.out.print("Insert number 3 : ");
        num3 = scanner.nextInt();

        Max3(num1, num2, num3);

        scanner.close();
    }
}
```

Result :

```
┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac ass1.java && java ass1.java
Insert number 1 : 5
Insert number 2 : 7
Insert number 3 : 3
The largest number = 7

┌──(zharsuke㉿LAPTOP-FCSRQQ00)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

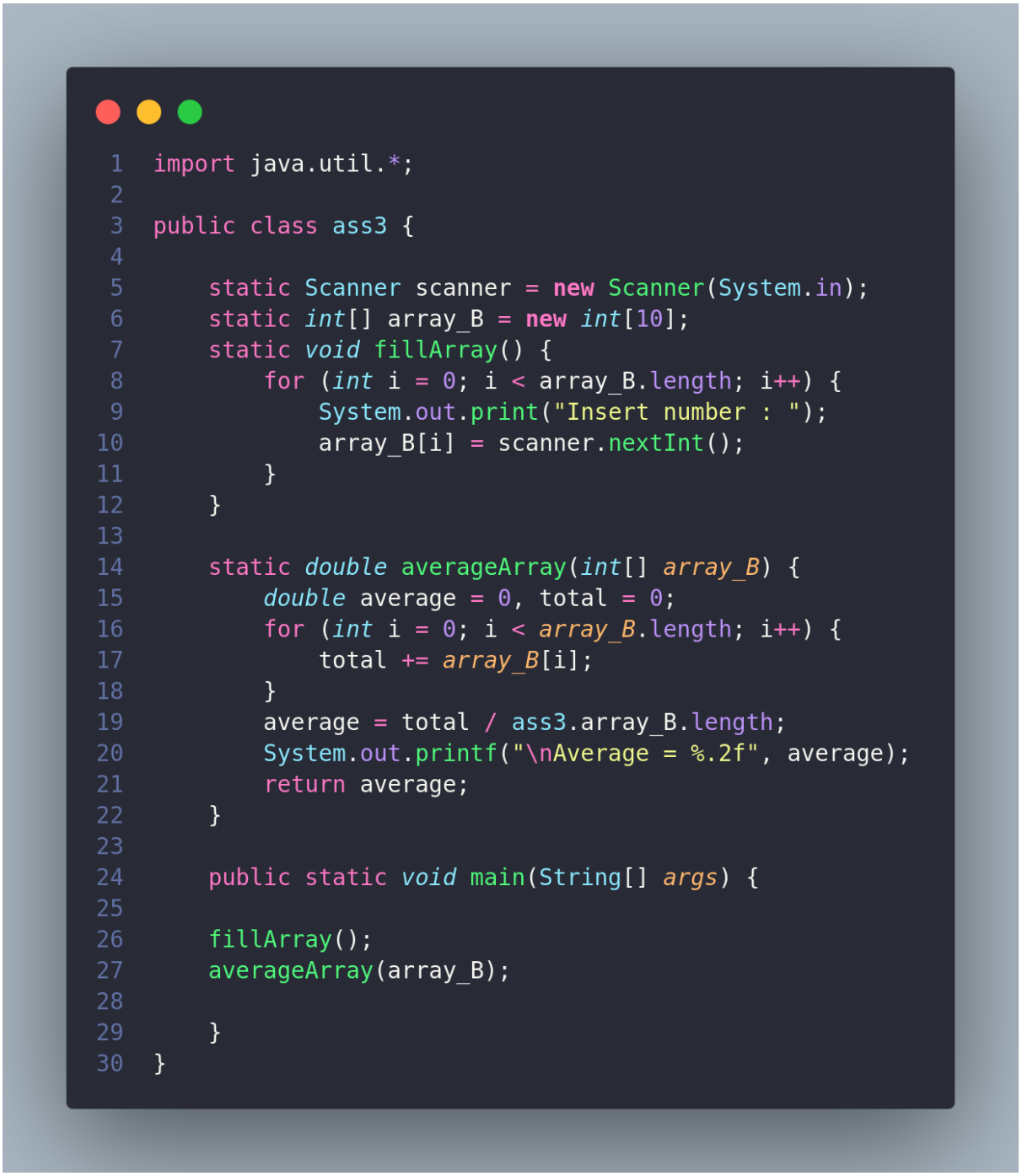
2. Code :

```java
import java.util.*;

public class Circle {

    static double circumFerenceCircle(double r) {
        double circumFerence = 0, phi = 3.14;
        circumFerence = phi * 2 * r;
        System.out.printf("Circum ference circle = %.2f\n", circumFerence);
        return circumFerence;
    }

    static double areaCircle(double r) {
        double area = 0, phi = 3.14;
        area = phi * r * r;
        System.out.printf("Area of circle = %.2f\n", area);
        return area;
    }

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);
        double r;

        System.out.print("Insert radius of circle : ");
        r = scanner.nextDouble();

        circumFerenceCircle(r);
        areaCircle(r);

        scanner.close();
    }
}
```

Result :

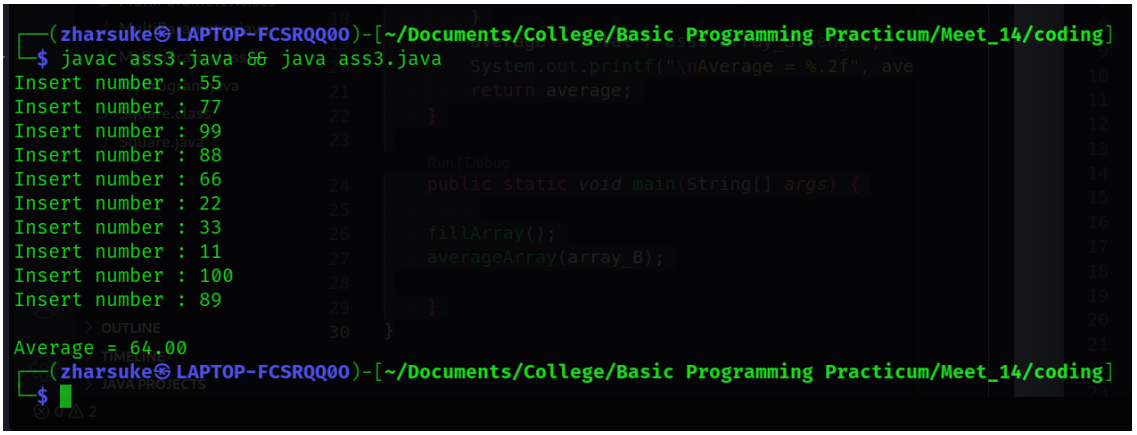
```
┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$ javac Circle.java && java Circle.java
Insert radius of circle : 6
Circum ference circle = 37.68
Area of circle = 113.04

┌──(zharsuke㉿LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
└─$
```

3. Code :



```java
import java.util.*;

public class ass3 {

    static Scanner scanner = new Scanner(System.in);
    static int[] array_B = new int[10];
    static void fillArray() {
        for (int i = 0; i < array_B.length; i++) {
            System.out.print("Insert number : ");
            array_B[i] = scanner.nextInt();
        }
    }

    static double averageArray(int[] array_B) {
        double average = 0, total = 0;
        for (int i = 0; i < array_B.length; i++) {
            total += array_B[i];
        }
        average = total / ass3.array_B.length;
        System.out.printf("\nAverage = %.2f", average);
        return average;
    }

    public static void main(String[] args) {

    fillArray();
    averageArray(array_B);

    }
}
```

Result :


zharsuke@LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
$ javac ass3.java && java ass3.java
Insert number : 55
Insert number : 77
Insert number : 99
Insert number : 88
Insert number : 66
Insert number : 22
Insert number : 33
Insert number : 11
Insert number : 100
Insert number : 89
Average = 64.00
zharsuke@LAPTOP-FCSRQQ0O)-[~/Documents/College/Basic Programming Practicum/Meet_14/coding]
$