Java - Introduction to Programming
Lecture 7

Methods/Functions

A function is a block of code that performs a specific task.
Why are functions used?

a. If some functionality is performed at multiple places in software, then rather than writing the same code, again and again, we create a function and call it everywhere. This helps reduce code redundancy.
b. Functions make maintenance of code easy as we have to change at one place if we make future changes to the functionality.
c. Functions make the code more readable and easy to understand.

The **syntax** for function declaration is :

```
return-type function_name (parameter 1, parameter2,  ..... parameter n){
//function_body
}
return-type
```

The **return type** of a function is the data type of the variable that that function returns.

For eg - If we write a function that adds 2 integers and returns their sum then the return type of this function will be 'int' as we will return a sum that is an integer value.
When a function does not return any value, in that case the return type of the function is 'void'.

function_name
It is the unique name of that function.
It is always recommended to declare a function before it is used.

Parameters
A function can take some parameters as inputs. These parameters are specified along with their data types.
For eg- if we are writing a function to add 2 integers, the parameters would be passed like –
int add (int num1, int num2)

main function

The main function is a special function as the computer starts running the code from the beginning of the main function. Main function serves as the entry point for the program.

Example :

```
package com.apnacollege;

public class Main {
    //A METHOD to calculate sum of 2 numbers - a & b
    public static void sum(int a, int b) {
        int sum = a + b;
        System.out.println(sum);
    }

    public static void main(String[] args) {
        int a = 10;
        int b = 20;
        sum(a, b); // Function Call

    }
}
```

Qs. Write a function to multiply 2 numbers.

```
import java.util.*;



public class Functions {



    //Multiply 2 numbers

    public static int multiply(int a, int b) {

        return a*b;

    }

    public static void main(String args[]) {

        Scanner sc = new Scanner(System.in);
```

```
        int a = sc.nextInt();

        int b = sc.nextInt();



        int result = multiply(a, b);

        System.out.println(result);

    }

}
```

Qs. Write a function to calculate the factorial of a number.

```
import java.util.*;

public class Functions {
    // public static int calculateSum(int a, int b) {
    //     int sum = a + b;
    //     return sum;
    // }

    // public static int calculateProduct(int a, int b) {
    //    return a * b;
    // }

    public static void printFactorial(int n) {
        //loop
        if(n < 0) {
            System.out.println("Invalid Number");
            return;
        }
        int factorial = 1;

        for(int i=n; i>=1; i--) {
            factorial = factorial * i;
        }

        System.out.println(factorial);
        return;
    }
```

```
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        int n = sc.nextInt();

        printFactorial(n);
    }
}
```

Qs. Write a function to calculate the product of 2 numbers.

```
import java.util.*;



public class Functions {

    // public static int calculateSum(int a, int b) {

    //     int sum = a + b;

    //     return sum;

    // }



    public static int calculateProduct(int a, int b) {

       return a * b;

    }



        public static void main(String args[]) {

        Scanner sc = new Scanner(System.in);

        int a = sc.nextInt();

        int b = sc.nextInt();

        System.out.println(calculateProduct(a, b));

    }

}
```

Homework Problems

1. Make a function to check if a number is prime or not.
2. Make a function to check if a given number n is even or not.
3. Make a function to print the table of a given number n.
4. Read about Recursion.