Object Oriented Programming Using Java

Assignment - 2

Class, Object, User Input, and Math

1. Write a Java program to display greetings message for a user. Take the username as input at run time. Define a method **public void greet (String name)** to perform the operation.
2. Write a Java program to take two numbers x and y as input and perform the following operation using the Math library.
    a. Find the maximum between x and y
    b. Find the minimum between x and y
    c. Find x^y
    d. Find $\sqrt{x}$
    e. Generate a random number between 10 and 100
3. Write a Java program to perform the operation of a simple calculator (+, -, *, and /) using a switch case statement. Input two operands and the operator at the run time.
4. Write a Java program to display the prime numbers between x and y where both x and y is inclusive.
5. Write a Java program to find the sum of the following series. Take the value of x and n is user input. Define a function **fact(int n)** which will calculate the factorial of number and use this function while calculating the sum.

$$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \ldots\ldots\frac{x^n}{n!}$$

6. Write a Java program to check if a number is palindrome of not. Write a user-defined function **public boolean isPalindrome(int num)**, which will return true if the given umber is palindrome and false otherwise. Take the number as input at runtime in the main method and pass it to the isPalindrome method.
7. Write a Java program to find the binary equivalent of a given decimal number. Write a user-defined functions to perform the operation. Test the function in the main method.
8. The body mass index (BMI) of a person is defined as the ratio of body mass in kilograms to the square of body height in meter.

$$\text{BMI} = \text{Weight in Kg}/(\text{Height in Meters})^2$$

Write a Java function to calculate and return the body mass index (BMI) of the user. Ask the user for their height and their mass/weight in the main function and pass it to the BMI calculator function. In the main display the value of the BMI and the meaning of that value using the following table.

BMI Range	Category
< 18.5	Underweight
18.5 - 25	Normal
25 - 30	Overweight
> 30	Obese

9. Write a Java program to find the factorial of a given number using recursion.
10. Write a Java recursive method to find the sum of the digits of a given integer.