FULL STACK DEVELOPMENT

WORKSHEET – 2

1. Write a Java Program to Count the Number of Digits in a Number.

Sol: import java.util.Scanner;

```
public class DigitCounter {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Prompt user to enter a number
        System.out.print("Enter a number: ");
        int number = scanner.nextInt();

        // Handle negative numbers by converting them to positive
        if (number < 0) {
            number = -number;
        }

        // If the number is 0, it has exactly one digit
        if (number == 0) {
            System.out.println("The number of digits is: 1");
            return;
        }

        int digitCount = 0;

        // Loop until the number becomes 0
```

```java
        while (number != 0) {
            number /= 10;  // Remove the last digit
            digitCount++;  // Increment the digit count
        }


        // Output the result
        System.out.println("The number of digits is: " + digitCount);
    }
}
```

2. - Write a Java Code to Count Vowels and Consonants in a String.

Sol: import java.util.Scanner;

```java
public class VowelConsonantCounter {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Prompt user to enter a string
        System.out.print("Enter a string: ");
        String inputString = scanner.nextLine();

        // Convert the string to lowercase to simplify checks
        inputString = inputString.toLowerCase();

        int vowelCount = 0;
        int consonantCount = 0;

        // Loop through each character in the string
        for (int i = 0; i < inputString.length(); i++) {
            char ch = inputString.charAt(i);

            // Check if the character is a vowel
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {
                vowelCount++;
            }
            // Check if the character is a consonant (it should be a letter but not a vowel)
            else if (ch >= 'a' && ch <= 'z') {
```

```java
                consonantCount++;
            }
        }


        // Output the results
        System.out.println("Number of vowels: " + vowelCount);
        System.out.println("Number of consonants: " + consonantCount);
    }
}
```

3. Write a Java Code for showing Inheritance.
Sol: // Base class

```java
class Animal {
    // Fields
    String name;
    int age;

    // Constructor
    public Animal(String name, int age) {
        this.name = name;
        this.age = age;
    }

    // Method to display details
    public void displayDetails() {
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
    }

    // Method to simulate sound
    public void makeSound() {
        System.out.println("Animal makes a sound");
    }
}

// Derived class
class Dog extends Animal {
    // Additional field
```

```java
    String breed;

    // Constructor
    public Dog(String name, int age, String breed) {
        // Call the constructor of the base class
        super(name, age);
        this.breed = breed;
    }

    // Overriding the makeSound method
    @Override
    public void makeSound() {
        System.out.println("Dog barks");
    }

    // Method to display details
    @Override
    public void displayDetails() {
        super.displayDetails();  // Call the base class method
        System.out.println("Breed: " + breed);
    }
}

public class InheritanceDemo {
    public static void main(String[] args) {
        // Create an instance of Dog
        Dog myDog = new Dog("Buddy", 5, "Golden Retriever");
```

```java
        // Call methods on the Dog instance
        myDog.displayDetails();
        myDog.makeSound();
    }
}
```

4. -Write a Java program to check if a vowel is present in a string.

Sol: import java.util.Scanner;

```java
public class VowelChecker {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Prompt user to enter a string
        System.out.print("Enter a string: ");
        String inputString = scanner.nextLine();

        // Convert the string to lowercase to simplify checks
        inputString = inputString.toLowerCase();

        // Check if the string contains any vowel
        boolean hasVowel = false;
        for (int i = 0; i < inputString.length(); i++) {
            char ch = inputString.charAt(i);
```

```java
        if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {
            hasVowel = true;
            break;
        }
    }


    // Output the result
    if (hasVowel) {
        System.out.println("The string contains at least one vowel.");
    } else {
        System.out.println("The string does not contain any vowels.");
    }
  }
}
```

5. -Write a program to remove duplicate elements from an array in Java.

Sol: import java.util.Arrays;

```java
public class RemoveDuplicates {
    public static void main(String[] args) {
        int[] array = {1, 2, 2, 3, 4, 4, 5};
        int[] result = removeDuplicates(array);


        // Print the result array
        System.out.println("Array after removing duplicates: " +
Arrays.toString(result));
    }


    public static int[] removeDuplicates(int[] array) {
        // Sort the array
        Arrays.sort(array);


        // Temporary array to hold unique elements
        int[] temp = new int[array.length];
        int j = 0;


        // Loop through the array
        for (int i = 0; i < array.length - 1; i++) {
            if (array[i] != array[i + 1]) {
                temp[j++] = array[i];
            }
        }
```

```java
        // Add the last element
        temp[j++] = array[array.length - 1];


        // Copy the unique elements to the result array
        int[] result = new int[j];
        System.arraycopy(temp, 0, result, 0, j);


        return result;
    }
}
```