Lab 4

1. Method Overloading: Write a class Calculator with overloaded methods add(). Implement add() methods that take:
   - Two integers
   - Two double values
   - Three integers
- A variable number of integers

Code:

```java
package hellow;
public class Calculator3 {
  // Method to add two integers
  public int add(int a, int b) {
    return a + b;
  }
  // Method to add two double values
  public double add(double a, double b) {
    return a + b;
  }
  // Method to add three integers
  public int add(int a, int b, int c) {
    return a + b + c;
  }
  // Method to add a variable number of integers
  public int add(int... numbers) {
    int sum = 0;
    for (int num : numbers) {
      sum += num;
    }
    return sum;
  }
  public static void main(String[] args) {
    Calculator3 cal = new Calculator3();

    // Testing the add methods
    System.out.println("Add two integers: " + cal.add(1, 2));
    System.out.println("Add two doubles: " + cal.add(1.5, 2.5));
    System.out.println("Add three integers: " + cal.add(1, 2, 3));
    System.out.println("Add variable number of integers: " + cal.add(1, 2, 3, 4));
  }
}
```

Output:

```
<terminated> Calculator3 [Java Application] C:\Users\Ashish\.p2\pool\plu
Add two integers: 3
Add two doubles: 4.0
Add three integers: 6
Add variable number of integers: 10
```

2. Super Keyword: Create a class Person with a constructor that accepts and sets name and age.
- Create a subclass Student that adds a grade property and initializes name and age using the super keyword in its constructor.
- Demonstrate the creation of Student objects and the usage of super to call the parent class constructor.

Code:

```
package hellow;
// Person class
 class Persoon {
   protected String name;
   protected int age;

   public Persoon(String name, int age) {
     this.name = name;
     this.age = age;
   }
   public void displayInfo() {
     System.out.println("Name: " + name + ", Age: " + age);
   }
}
// base Student  class
 class Studeent extends Persoon {
   private String grade;

   public Studeent(String name, int age, String grade) {
     super(name, age);
     this.grade = grade;
   }
   @Override
   public void displayInfo() {
     super.displayInfo();    //using super keyword
     System.out.println("Grade: " + grade);
   }
}
// main class
public class SuperKeyword {
   public static void main(String[] args) {
     Studeent student1 = new Studeent("Ashish", 21, "A");
     Studeent student2 = new Studeent("Sanika", 28, "A");
     //calling methods
     student1.displayInfo();
     student2.displayInfo();
   }
}
```

Output:

```
<terminated> SuperKeyword [Java Application] C:\Users\Ashish\.p2\
Name: Ashish, Age: 21
Grade: A
Name: Sanika, Age: 28
Grade: A
```

3. Super Keyword: Create a base class Shape with a method draw() that prints "Drawing Shape".
- Create a subclass Circle that overrides draw() to print "Drawing Circle".
- Inside the draw() method of Circle, call the draw() method of the Shape class using super.draw().
- Write a main method to demonstrate calling draw() on a Circle object.

Code:

```java
package hellow;

//Shape.java
 class Shape {
 public void draw() {
   System.out.println("Ashish is Drawing Shape");
 }
}

//Circle.java
 class Circle extends Shape {
 @Override
 public void draw() {
   super.draw(); // Call the draw() method of Shape
   System.out.println("Ashish is Drawing Circle");
 }
}

//Main.java
public class Lab4 {
 public static void main(String[] args) {
   Circle circle = new Circle();

  // This will call the draw method of Circle
   circle.draw();
 }
}
```

Output:

```
<terminated> Lab4 [Java Application] C:\Users\Ashish\.p2\pd
Ashish is Drawing Shape
Ashish is Drawing Circle
```

4. Write a Java Program to count the number of words in a String without using the Predefined method?

Code:

```
package hellow;

public class WordCount {

  public static int countWords(String str) {
    if (str == null || str.isEmpty()) {
      return 0;
    }

    int Count = 0;
    boolean isWord = false;
    int endLine = str.length() - 1;
    char[] characters = str.toCharArray();

    for (int i = 0; i < characters.length; i++) {
          // If the character is a letter, word = true.
          if (Character.isLetter(characters[i]) && i != endLine) {
            isWord = true;
          }
          // If the character isn't a letter and there have been letters before,
          // count the word and set word = false.
          else if (!Character.isLetter(characters[i]) && isWord) {
            Count++;
            isWord = false;

          }
          // Last word of the string; if it doesn't end with a non-letter, it
counts as a word.
          else if (Character.isLetter(characters[i]) && i == endLine) {
            Count++;
          }
    }
    return Count;
  }

  public static void main(String[] args) {
    String line = "Hii i am Ashish, i am a good Coder.";
    int numberOfWords = countWords(line);

    System.out.println("Sentance is : "+line);
    System.out.println("Number of words in the string: " + numberOfWords);
  }
}
```

Output:

```
<terminated> WordCount [Java Application] C:\Users\Ashish\.p2\pool\plugin
Sentance is : Hii i am Ashish, i am a good Coder.
Number of words in the string: 9
```

5. Write a Java Program to remove all white spaces from a String?
Code:

```java
package hellow;
import java.util.StringTokenizer;

public class RemoveWhiteSpaces {

  public static String removeSpaces(String str) {
    if (str == null || str.isEmpty()) {
      return str;
    }

    StringTokenizer token = new StringTokenizer(str);
    StringBuilder result = new StringBuilder();

    while (token.hasMoreTokens()) {
      result.append(token.nextToken());
    }

    return result.toString();
  }

  public static void main(String[] args) {
    String input = "Hii i am Ashish, i am a good Coder.";
    String noSpaces = removeSpaces(input);
    System.out.println("Original string: " + input);
    System.out.println("String without spaces: " + noSpaces);
  }
}
```

Output:

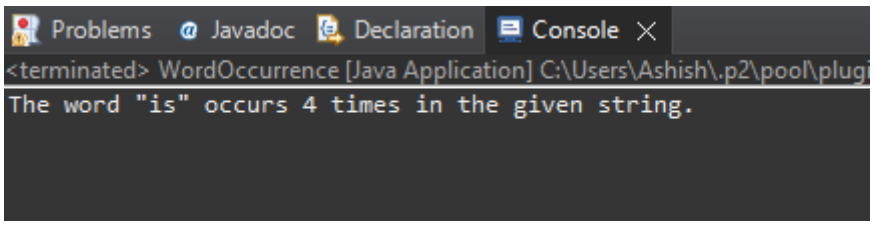
```
<terminated> RemoveWhiteSpaces [Java Application] C:\Users\Ashish\.p2\poo
Original string: Hii i am Ashish, i am a good Coder.
String without spaces: HiiiamAshish,iamagoodCoder.
```

6. WAP to find occurrence of given in the given string.
Code:

```java
package hellow;
public class WordOccurrence {

  public static int countOccurrences(String str, String word) {
    // lest check first string or word is empty or not
    if (str == null || word == null || str.isEmpty() || word.isEmpty()) {
      return 0;
    }

    int count = 0;
    int index = 0;
```

```
    //whilw loop for finds occurance
    while ((index = str.indexOf(word, index)) != -1) {
      count++;
      index += word.length();
    }

    return count;
  }
  public static void main(String[] args) {
    String input = "This is a test string. This string is for testing.";
    String word = "is";

    int occurrences = countOccurrences(input, word);
    System.out.println("The word \"" + word + "\" occurs " + occurrences + " times
in the given string.");
  }
}
```

Output:



7. Write a java class to implement any 10 string methods:
● replace ● contains ● replaceAll ● indexOf ● substring ● Equals ● lastIndexOf ● startsWith ● endsWith ● EqualsIgnoreCase ● toLowerCase ● toUpperCase ● isEmpty ● Length ● split

Code:

```
package hellow;

public class StringMethodsExample {
  public static void main(String[] args) {
    String str = "i am Ashish Kashyap it is my sentence.";
    // using replace
    String replacedStr = str.replace("World", "Java");
    System.out.println("replace: " + replacedStr + "\n");

    // using contains
    boolean containsStr = str.contains("test");
    System.out.println("contains: " + containsStr + "\n");

    // implementing replaceAll
    String replaceAllStr = str.replaceAll("is", "was");
    System.out.println("replaceAll: " + replaceAllStr + "\n");

    // implementing indexOf
    int indexOfStr = str.indexOf("test");
    System.out.println("indexOf: " + indexOfStr + "\n");
```

```java
    // implementing substring
    String substringStr = str.substring(7, 12);
    System.out.println("substring: " + substringStr + "\n");

    // implementing equals
    boolean equalsStr = str.equals("Hello, World! This is a test string.");
    System.out.println("equals: " + equalsStr + "\n");

    // implementing lastIndexOf
    int lastIndexOfStr = str.lastIndexOf("is");
    System.out.println("lastIndexOf: " + lastIndexOfStr + "\n");

    // startsWith
    boolean startsWithStr = str.startsWith("Hello");
    System.out.println("startsWith: " + startsWithStr + "\n");

    // implementing endsWith
    boolean endsWithStr = str.endsWith("string.");
    System.out.println("endsWith: " + endsWithStr + "\n");

    // implementing equalsIgnoreCase
    boolean equalsIgnoreCaseStr = str.equalsIgnoreCase("hello, world! this is a
test string.");
    System.out.println("equalsIgnoreCase: " + equalsIgnoreCaseStr + "\n");

    // implementing toLowerCase
    String lowerCaseStr = str.toLowerCase();
    System.out.println("toLowerCase: " + lowerCaseStr + "\n");

    // implementing toUpperCase
    String upperCaseStr = str.toUpperCase();
    System.out.println("toUpperCase: " + upperCaseStr + "\n");

    // implementing isEmpty
    boolean isEmptyStr = str.isEmpty();
    System.out.println("isEmpty: " + isEmptyStr + "\n");

    // implementing length
    int lengthStr = str.length();
    System.out.println("length: " + lengthStr + "\n");

    // implementing split
    String[] splitStr = str.split(" ");
    System.out.print("split: ");
    for (String s : splitStr) {
      System.out.print(s + " | " + "\n");
    }
  }
}
```

Output:

```
<terminated> StringMethodsExample [Java Application] C:\Users\Ashish\.p2\pool\plugins\org.ec

replaceAll: i am Ashwash Kashyap it was my sentence.

indexOf: -1

substring: hish

equals: false

lastIndexOf: 23

startsWith: false

endsWith: false

equalsIgnoreCase: false

toLowerCase: i am ashish kashyap it is my sentence.

toUpperCase: I AM ASHISH KASHYAP IT IS MY SENTENCE.

isEmpty: false

length: 38

split: i |
am |
Ashish |
Kashyap |
it |
is |
my |
sentence. |
```

8. Write a java program to implement string tokenizer.

Code:

```java
package hellow;

import java.util.StringTokenizer;

public class StringTokenizerExample {
  public static void main(String[] args) {
    String str = "Hello, World! I am Ashish Kashyap";

    // Create a StringTokenizer with the default delimiter (whitespace)
    StringTokenizer tokenizer = new StringTokenizer(str);

    System.out.println("Tokens with default delimiter (whitespace):");
    while (tokenizer.hasMoreTokens()) {
      System.out.println(tokenizer.nextToken());
    }

    // Create a StringTokenizer with a custom delimiter
```

```java
    String customStr = "Hello,World!This,is,a,test,string.";
    StringTokenizer customTokenizer = new StringTokenizer(customStr, ",!");

    System.out.println("\nTokens with custom delimiters (, and !):");
    while (customTokenizer.hasMoreTokens()) {
      System.out.println(customTokenizer.nextToken());
    }
  }
}
```

Output:

```
<terminated> StringTokenizerExample [Java Application] C:\Users\Ashish\.p2\pool
Tokens with default delimiter (whitespace):
Hello,
World!
I
am
Ashish
Kashyap

Tokens with custom delimiters (, and !):
Hello
World
This
is
a
test
string.
```