4 prgm:

```
public class Main {
    public static void main(String[] args) {
        String str = "Welcome to Bmsce college";
        StringBuilder bmsce = new StringBuilder();
        int startIndex = 7;
        int endIndex = 10;

        for (int i = startIndex; i < endIndex; i++) {
            bmsce.append(str.charAt(i));
        }

        System.out.println(bmsce.toString());
    }
}
```

prgm :5

```
public class Main {
    public static void main(String[] args) {
        String str = "Welcome to Bmsce college";
        String bmsceStr = "Bmsce";
        StringBuilder bmsce = new StringBuilder();

        for (int i = 0; i < bmsceStr.length(); i++) {
            char bmsceChar = bmsceStr.charAt(i);
            byte[] bytes = str.getBytes();
            byte[] charBytes = {0, 0};

            for (int j = 0; j < bytes.length; j += 2) {
                charBytes[0] = bytes[j];
                charBytes[1] = bytes[j + 1];
                char extractedChar = String.valueOf(charBytes).toCharArray()[0];

                if (extractedChar == bmsceChar) {
                    bmsce.append(extractedChar);
                    break;
                }
            }
        }

        System.out.println(bmsce.toString());
    }
}
```

prgm 6:

```
public class Main {
    public static void main(String[] args) {
        String str1 = "Bmsce";
        String str2 = "College";
        String str3 = "BMSCE";
        String str4 = "BMSCE";

        System.out.println(str1.equals(str1)); // returns true
        System.out.println(str1.equals(str2)); // returns false
        System.out.println(str1.equals(str3)); // returns false
        System.out.println(str1.equalsIgnoreCase(str3)); // returns true
    }
}
```

prgm 7:

```
public static void main(String[] args) {

    String inputString = "Welcome to Bmsce College of Engineering";
    String searchString = "Bmsce college ";

    if (inputString.regionMatches(true, 8, searchString, 0, searchString.length())) {
        System.out.println("Substring is matched");
    } else {
        System.out.println("Substring is not matched");
    }
}
```

prgm 8:

```
public class Main {

    public static void main(String[] args) {

        String inputString = "Welcome to Bmsce College of Engineering";
        String searchString = "Welcome to";

        if (inputString.startsWith(searchString)) {
            System.out.println("String starts with the specified substring");
        } else {
            System.out.println("String does not start with the specified substring");
        }
    }
}
```

prgm 9 :

```
public class Main {

    public static void main(String[] args) {

        String inputString = "Welcome to Bmsce College of Engineering";
        String searchString = "Engineering";

        if (inputString.endsWith(searchString)) {
            System.out.println("String ends with the specified substring");
        } else {
            System.out.println("String does not end with the specified substring");
        }
    }
}
```

prgm 10:

```
public class Main {

    public static void main(String[] args) {

        String string1 = new String("Hello");
        String string2 = new String("Hello");

        // Testing equals() method
        if (string1.equals(string2)) {
            System.out.println("The two strings are equal using the equals() method.");
        } else {
            System.out.println("The two strings are not equal using the equals() method.");
        }

        // Testing == operator
        if (string1 == string2) {
            System.out.println("The two strings are equal using the == operator.");
        } else {
            System.out.println("The two strings are not equal using the == operator.");
        }
    }
}
```

11.

```
import java.util.Arrays;

public class SortAlphabets {
    public static void main(String[] args) {
        String[] words = {"van", "watch","ball", "cat","xmas","yatch",
"zee","apple","ice","jug","kite","lift","man","net","orange","dog","ent","free","gun","hen","parrot","q
ueen","ring","star","tree","umbrella"};
        Arrays.sort(words);
        for (String word : words) {
            System.out.println(word);
        }
    }
}
```

12.

```
public class SortNumbers {
    public static void main(String[] args) {
        String[] numbers = {"1", "2", "3", "4", "5", "6", "7", "8", "9", "10"};

        for (int i = 0; i < numbers.length; i++) {
            for (int j = i + 1; j < numbers.length; j++) {
                if (numbers[i].compareTo(numbers[j]) > 0) {
                    String temp = numbers[i];
                    numbers[i] = numbers[j];
                    numbers[j] = temp;
                }
            }
        }

        System.out.println("Sorted numbers: ");
        for (String number : numbers) {
            System.out.print(number + " ");
        }
    }
}
```

13.

```
public class Main {
    public static void main(String[] args) {
        String sentence = "Thwas was a test. Thwas was, too.";
        int index = sentence.indexOf("was");

        while (index != -1) {
            String before = sentence.substring(0, index);
            String after = sentence.substring(index + 3); // +3 to include the length of "was"
            sentence = before + "is" + after;
            index = sentence.indexOf("was", index + 1); // search for the next occurrence after the
current one
        }
        System.out.println(sentence); // prints "This is a test. This is, too."
    }
}
```

14;

```
public class Main
{
    public static void main(String[] args) {
        String s1 = "hello";
        String s2 = "world";
        String s3 = s1.concat(s2);
        System.out.println(s3); // prints "helloworld"
    }
}
```

15.

```
public class Main {

    public static void main(String[] args) {
        String originalString = "The best college in the world is Commege";
        String oldSubstring = "College";
        String newSubstring = "Commege";

        String replacedString = originalString.replace(oldSubstring, newSubstring);

        System.out.println(replacedString); // prints "The best college in the world is Commege"
    }
}
```

16.

```
public class Main {
    public static void main(String[] args) {
        String originalString = " Hello Friends ";
        String trimmedString = originalString.trim();

        System.out.println(trimmedString); // prints "Hello Friends"
    }
}
```

18.

```
public class Main {

    public static void main(String[] args) {

        StringBuffer stringBuffer = new StringBuffer("Hello");
        // setLength(): Sets the length of the StringBuffer.
        stringBuffer.setLength(0);
        System.out.println("StringBuffer after setLength(): " + stringBuffer);

        // append(): Appends the given string to the end of the StringBuffer.
        stringBuffer.append("Hello").append(" ").append("World");
        System.out.println("StringBuffer after append(): " + stringBuffer);

        // insert(): Inserts the given string at the specified offset.
        stringBuffer.insert(5, "beautiful ");
        System.out.println("StringBuffer after insert(): " + stringBuffer);

        // reverse(): Reverses the order of characters in the StringBuffer.
        stringBuffer.reverse();
        System.out.println("StringBuffer after reverse(): " + stringBuffer);

        // delete(): Deletes the characters in the StringBuffer from the specified start index to the specified end index.
        stringBuffer.delete(6, 14);
        System.out.println("StringBuffer after delete(): " + stringBuffer);

        // replace(): Replaces the characters in the StringBuffer from the specified start index to the specified end index with the given string.
        stringBuffer.replace(6, 12, "good");
        System.out.println("StringBuffer after replace(): " + stringBuffer);

        // substring(): Returns a new string that is a substring of the string buffer.
        System.out.println("Substring: " + stringBuffer.substring(6, 10));
    }
}
```

19.

```
abstract class Bird {
    abstract void fly();
    abstract void makeSound();
}

class Eagle extends Bird {
    void fly() {
        System.out.println("Eagle soars high above.");
    }

    void makeSound() {
        System.out.println("Eagle makes a screeching sound.");
    }
}

class Hawk extends Bird {
    void fly() {
        System.out.println("Hawk glides smoothly through the air.");
    }

    void makeSound() {
        System.out.println("Hawk makes a high-pitched sound.");
    }
}

public class Main {
    public static void main(String[] args) {
        Bird eagle = new Eagle();
        Bird hawk = new Hawk();

        eagle.fly();
        eagle.makeSound();

        hawk.fly();
        hawk.makeSound();
    }
}
```

20.

```
import java.lang.Math;

abstract class Shape {
    abstract double calculateArea();
    abstract double calculatePerimeter();
}

class Circle extends Shape {
    private double radius;
    Circle(double radius) {
        this.radius = radius;
    }

    double calculateArea() {
        return Math.PI * radius * radius;
    }

    double calculatePerimeter() {
        return 2 * Math.PI * radius;
    }
}

class Triangle extends Shape {
    private double side1, side2, side3;

    Triangle(double side1, double side2, double side3) {
        this.side1 = side1;
        this.side2 = side2;
        this.side3 = side3;
    }

    double calculateArea() {
        double s = (side1 + side2 + side3) / 2;
        return Math.sqrt(s * (s - side1) * (s - side2) * (s - side3));
    }

    double calculatePerimeter() {
        return side1 + side2 + side3;
    }
}

public class Main {
    public static void main(String[] args) {
        Shape circle = new Circle(5);
        Shape triangle = new Triangle(3, 4, 5);

        System.out.println("Circle Area: " + circle.calculateArea());
        System.out.println("Circle Perimeter: " + circle.calculatePerimeter());

        System.out.println("Triangle Area: " + triangle.calculateArea());
        System.out.println("Triangle Perimeter: " + triangle.calculatePerimeter());
    }
}
```

17.

```
public class Student {
    private int registrationNumber;
    private String fullName;
    private short semester;
    private float cgpa;

    public Student() {
    }

    public Student(int registrationNumber, String fullName, short semester, float cgpa) {
        this.registrationNumber = registrationNumber;
        this.fullName = fullName;
        this.semester = semester;
        this.cgpa = cgpa;
    }

    public int getRegistrationNumber() {
        return registrationNumber;
    }

    public void setRegistrationNumber(int registrationNumber) {
```

```
    this.registrationNumber = registrationNumber;
}

public String getFullName() {
    return fullName;
}

public void setFullName(String fullName) {
    this.fullName = fullName;
}

public short getSemester() {
    return semester;
}

public void setSemester(short semester) {
    this.semester = semester;
}

public float getCgpa() {
    return cgpa;
}

public void setCgpa(float cgpa) {
    this.cgpa = cgpa;
}
```

```
    public void display() {
        System.out.println("Registration Number: " + registrationNumber);
        System.out.println("Full Name: " + fullName);
        System.out.println("Semester: " + semester);
        System.out.println("CGPA: " + cgpa);
    }

    public static void main(String[] args) {
        Student[] students = new Student[5];

        students[0] = new Student(1, "Alice", (short)2, 3.5f);
        students[1] = new Student(2, "Bob", (short)2, 3.7f);
        students[2] = new Student(3, "Charlie", (short)1, 3.8f);
        students[3] = new Student(4, "David", (short)3, 3.6f);
        students[4] = new Student(5, "Eve", (short)3, 3.9f);

        for (Student student : students) {
            student.display();
            System.out.println();
        }
    }
}
```

```
1.public class Main {
    public static void main(String[] args) {
        // Creating a new String object
        String str = new String();
        System.out.println("Value of str: " + str);

        // Creating a new String object with char array
        char[] charArray = {'H', 'e', 'l', 'l', 'o'};
        String str1 = new String(charArray);
        System.out.println("Value of str1: " + str1);

        // Creating a new String object with an existing string
        String sourceString = "Hello World";
        String str2 = new String(sourceString);
        System.out.println("Value of str2: " + str2);

        // Creating a new String object with char array and offset
        char[] charArray1 = {'H', 'e', 'l', 'l', 'o', ' ', 'W', 'o', 'r', 'l', 'd'};
        String str3 = new String(charArray1, 0, 5);
        System.out.println("Value of str3: " + str3);
    }
}

2.public class Main {
    public static void main(String[] args) {
        // String length
        String str = "Hello, World!";
        System.out.println("Length of str: " + str.length());

        // String literal
        String str1 = "Hello, World!";
        String str2 = "Hello, World!";
        System.out.println("str1 == str2: " + (str1 == str2));

        // String concat
        String str3 = "Hello, ";
        String str4 = "World!";
        String str5 = str3 + str4;
        System.out.println("Value of str5: " + str5);
    }
}

3.public class Main {
    public static void main(String[] args) {
        int num = 42;
        System.out.println("Value of num: " + num);
        System.out.println("toString() of num: " + num.toString());
    }
}
```