1.Write a program to print the area of a triangle having width and height by creating a class name ‘Triangle’ with parameter in its constructor. (By C++ or Java).

By C++ :

```
#include <iostream>
using namespace std;
class Triangle
{
public:
   double width;
   double height;
   Triangle(double width, double height)
   {
      this->height = height;
      this->width = width;
   }
   double area()
   {
      return .5 * width * height;
   }
};
int main()
{
   double h, w , a;
   cout << "Enter the Height and Width :" << endl;
   cin >> h >> w;
   Triangle object = Triangle(h, w);
   a = object.area();
   cout << "Triangle area is : " << a << endl;
   return 0;
}
```

—---

By Java:

```
import java.util.Scanner;
class Triangle {
   public double height;
   public double width;
   Triangle(double height, double width) {
      this.height = height;
      this.width = width;
   }
   double area() {
      return .5 * height * width;
   }
}
public class Lab1 {
   public static void main(String[] args) {
      Scanner input = new Scanner(System.in);


      System.out.println("Enter the Height and width: ");
      double h = input.nextDouble();
      double w = input.nextDouble();
      Triangle T = new Triangle(h,w);
```

```
        double area = T.area();
        System.out.println("This area of the Triangle is: " + area);
    }
}
```

2.Write a program to print the sum of the three numbers entered by user by creating a class and method.(By C++ or Java)

By C++:

```
#include <iostream>
using namespace std;
class Sum{
    int a, b, c, sum;
    public:
    Sum(int num1,int num2,int num3){
        sum = num1 + num2 + num3;
    }
    void display(){
        cout<<"The sum is : "<< sum<<endl;
    }
};
int main()
{
    int number1,number2,number3;
    cout<<"Enter three numbers : ";
    cin>>number1>>number2>>number3;


    Sum object(number1,number2,number3);
    object.display();

    return 0;
}
```

—---

By Java:

```
import java.util.Scanner;
class Sum {
    int a, b, c, sum;
    // Constructor to calculate the sum
    public Sum(int num1, int num2, int num3) {
        sum = num1 + num2 + num3;
    }
    // Method to display the sum
    public void display() {
        System.out.println("The sum is: " + sum);
    }
}
public class Lab2 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        System.out.println("Enter three numbers: ");
        int number1 = scanner.nextInt();
        int number2 = scanner.nextInt();
        int number3 = scanner.nextInt();


        Sum object = new Sum(number1, number2, number3);
        object.display();
        scanner.close();
    }
}
```

3.Write a program to find the maximum and minimum number between two numbers. Get the numbers from user.(By C++ or Java)

By C++:

```
#include <iostream>
using namespace std;


class Check_Number {
  int number_1;
  int number_2;


public:
  // Method to set numbers
  void set_numbers() {
    cout << endl;
    cout << "Enter the first number: ";
    cin >> number_1;  // Assigning directly to member variable


    cout << "Enter the second number: ";
    cin >> number_2;  // Assigning directly to member variable
    cout << endl;
  }


  // Method to check which number is greater
  void check() {
    if (number_1 > number_2) {
      cout << number_1 << " is greater than " << number_2 << endl;
    } else if (number_1 < number_2) {
      cout << number_2 << " is greater than " << number_1 << endl;
    } else {
      cout << "Numbers are equal" << endl;
    }
    cout << endl;
  }
};


int main() {
  // Create an instance of Check_Number
  Check_Number check_number;
  // Call the set_numbers method
  check_number.set_numbers();


  // Call the check method
  check_number.check();


  return 0;
}
```

—--

By Java:

```
import java.util.Scanner;


class Check_Number {


  int number_1;
  int number_2;


  public void set_numbers() {


     Scanner scanner = new Scanner(System.in);


     System.out.println();
     System.out.print("Enter the first number : ");
     number_1 = scanner.nextInt();


     System.out.print("Enter the second number : ");
     number_2 = scanner.nextInt();
     System.out.println();


     scanner.close();
  }


  public void check() {


     if(number_1 > number_2) {
        System.out.println(number_1+ " is greater than " +number_2);
     }

     else if(number_1 < number_2) {
        System.out.println(number_2+ " is greater than " +number_1);
     }


     else {
            System.out.println("Numbers are equal");
        }
        System.out.println();
    }
}


public class Lab3 {
    public static void main(String[] args) {


        Check_Number check_number = new Check_Number();
        check_number.set_numbers();
        check_number.check();
    }
}
```

4.Write a program to sort integers into ascending and descending order.(By C++ or Java)

By C++:

```
#include <iostream>
using namespace std;


class Sorting {
private:
    int length;
    int numbers[100];


public:
    void get_numbers() {


        cout << "How many numbers to be sorted : ";
        cin >> length;


        cout << "Enter the numbers to be sorted : ";


        for(int i = 0; i < length; i++) {
            cin >> numbers[i];
        }
    }


    void sort_numbers() {


        for(int i = 0; i < length; i++) {


            for(int j = i + 1; j < length; j++) {
                if(numbers[i] > numbers[j]) {

                    int temp = numbers[i];
                    numbers[i] = numbers[j];
                    numbers[j] = temp;
                }
            }
        }
    }

    void in_ascending() {

        cout << "\nNumbers in ascending order:  ";

        for(int i = 0; i < length; i++) {

            cout << numbers[i] << " ";
        }
        cout << endl;
    }

    void in_descending() {

        cout << "Numbers in descending order: ";

        for(int i = length - 1; i >= 0; i--) {

            cout << numbers[i] << " ";
        }
        cout << endl;
    }
};

int main() {

    Sorting sort;
    sort.get_numbers();
    sort.sort_numbers();
    sort.in_ascending();
    sort.in_descending();

    return 0;
}
```

By Java:

```
import java.util.Arrays;
import java.util.Scanner;


class Sort_Numbers {


   int[] numbers;
   int n;


   public void set_numbers() {


       Scanner scanner = new Scanner(System.in);


       // Here we are taking the length of the array


       System.out.print("\nHow many numbers to be sort : ");
       n = scanner.nextInt();
       System.out.println();


       numbers = new int[n];


       System.out.print("Enter the numbers : ");

       for( int i = 0 ; i < n ; i++) {
           numbers[i] = scanner.nextInt();
       }
       System.out.println();
       scanner.close();
   }


   public void numbers_sort () {


       Arrays.sort(numbers); // Here sort is a library function of class Arrays of java.util package


       System.out.print("Numbers sorted in ascending order :");


       for( int i = 0 ; i < n ; i++) {


           System.out.print(" " +numbers[i]);
       }


       System.out.println();
```

```
        System.out.print("Numbers sorted in descending order :");


        for( int i = n-1 ; i >= 0 ; i--) {


            System.out.print(" " +numbers[i]);
        }
        System.out.println();
    }
}


public class Lab4 {
    public static void main(String[] args) {


        Sort_Numbers sort_numbers = new Sort_Numbers();
        sort_numbers.set_numbers();
        sort_numbers.numbers_sort();
    }
}
```

5.Write a program that takes two matrix and finds the sum of them.(By C++ or Java)

By C++:

```
#include <iostream>
using namespace std;


class Matrix_Calc {


private:
    int row;
    int col;

    int m1[100][100];
    int m2[100][100];

public:


    void set_Matrix() {
        cout << "\nEnter number of rows for matrix 1 and 2: ";
        cin >> row;


        cout << "Enter number of columns for matrix 1 and 2: ";
        cin >> col;


        // Initializing the matrices
        m1[row][col];
        m2[row][col];
        cout << "\nEnter elements for matrix 1:" << endl;
        for (int i = 0; i < row; ++i) {
            for (int j = 0; j < col; ++j) {
                cout << "matrix1[" << i << "][" << j << "]= ";
                cin >> m1[i][j];
            }
        }


        cout << "Enter elements for matrix 2:" << endl;
        for (int i = 0; i < row; ++i) {
            for (int j = 0; j < col; ++j) {
                cout << "matrix2[" << i << "][" << j << "]= ";
                cin >> m2[i][j];
            }
        }
    }


    void get_matrix() const {


        cout << "Showing matrix 1 and 2: " << endl << endl;
        cout << "m1 =";


        for (int i = 0; i < row; ++i) {
            for (int j = 0; j < col; ++j) {
                cout << "\t" << m1[i][j];
            }
            cout << endl;
        }
        cout << endl;


        cout << "m2 =";
        for (int i = 0; i < row; ++i) {
            for (int j = 0; j < col; ++j) {
                cout << "\t" << m2[i][j];
            }
            cout << endl;
        }
    }


    void add_matrix() {


        cout << "\nAfter adding matrix 1 and 2: " << endl << endl;
        cout << "m1+m2 =";
        for (int i = 0; i < row; ++i) {
            for (int j = 0; j < col; ++j) {
                cout << "\t" << (m1[i][j] + m2[i][j]);
            }
            cout << endl;
        }
    }
```

```
};


int main() {
  Matrix_Calc calc;


  calc.set_Matrix();
  calc.get_matrix();
  calc.add_matrix();


  return 0;
}
```

By Java:

```
import java.util.Scanner;


class Matrix_Calc {


  int row;
  int col;


  int[][] m1;
  int[][] m2;


  public void set_Matrix() {


     Scanner input = new Scanner(System.in);
     System.out.println();
     System.out.print("Enter number of rows for matrix 1 and 2: ");
     row = input.nextInt();


     System.out.print("Enter number of columns for matrix 1 and 2: ");
     col = input.nextInt();

     // Initializing the matrixes
     m1 = new int[row][col];
     m2 = new int[row][col];


     System.out.println();
     System.out.println("Enter elements for matrix 1:");


     for(int i = 0; i < row; i++) {
        for(int j = 0; j < col; j++) {
           System.out.printf("matrix1[%d][%d]= ", i, j);
           m1[i][j] = input.nextInt();
        }
        }


        System.out.println("Enter elements for matrix 2:");
        for(int i = 0; i < row; i++) {
            for(int j = 0; j < col; j++) {
                System.out.printf("matrix2[%d][%d]= ", i, j);
                m2[i][j] = input.nextInt();
            }
        }
        input.close();
    }


    public void get_matrix() {


        System.out.println();
        System.out.println("Showing matrix 1 and 2 : ");
        System.out.println();


        System.out.print("m1 =");
        for(int i = 0; i < row; i++) {
            for(int j = 0; j < col; j++) {
                System.out.print("\t" + m1[i][j]);
            }
            System.out.println();
        }
        System.out.println();


        System.out.print("m2 =");
        for(int i = 0; i < row; i++) {
            for(int j = 0; j < col; j++) {
                System.out.print("\t" + m2[i][j]);
            }
            System.out.println();
        }
    }


    public void add_matrix() {


        System.out.println();
        System.out.println("After adding matrix 1 and 2 : ");
        System.out.println();


        System.out.print("m1+m2 =");


        for(int i = 0; i < row; i++) {
            for(int j = 0; j < col; j++) {
                System.out.print("\t" + (m1[i][j] + m2[i][j]));
            }
            System.out.println();
        }
```

```
   }
}


public class Lab5 {
   public static void main(String[] args) {


       Matrix_Calc calc = new Matrix_Calc();
       calc.set_Matrix();
       calc.get_matrix();
       calc.add_matrix();
   }
}
```

6.Write a program to input two strings and add them.(By C++ or Java)

By C++:

```
#include <iostream>
#include <string>
using namespace std;


class Add {


public:


   string string_1, string_2;


   void set_strings () {


       cout << "Enter String 1: ";
       cin >> string_1;


       cout << "Enter String 2: ";
       cin >> string_2;
   }
   void strings_add() {


       string string_3 = string_1 + " " + string_2;  // we could also use string_3 =
 string_1.append(string_2);


       cout << "\nAfter adding two strings : " << string_3 << endl;
   }
};
int main() {
   Add add;
   add.set_strings();
   add.strings_add();
   return 0;
}
```

By Java:

```
import java.util.Scanner;
class Add {
   String string_1;
   String string_2;


   public void set_strings() {
       Scanner scanner = new Scanner(System.in);


       System.out.print("Enter String 1 : ");
       string_1 = scanner.next();
       scanner.nextLine();


       System.out.print("Enter String 2 : ");
       string_2 = scanner.nextLine();


       scanner.close();
   }


   public void strings_add () {


       String string_3 = string_1 + " " + string_2;  // we could also use string_3 =
 string_1.concat(string_2);


       System.out.println();
       System.out.println("After adding two strings : " +string_3);
   }
}


public class Lab6 {

   public static void main(String[] args) {
       Add add = new Add();
       add.set_strings();
       add.strings_add();
   }
}
```

7.Write a program to display student details using class.(By C++ or Java)

By C++:

```
#include <iostream>
#include <string>
using namespace std;


class Student {
private:
   string name;
   int roll;
   string section;
public:
   void set_details() {

       cout << "\nEnter name of student: ";
       cin >> name;


       cout << "Enter roll: ";
       cin >> roll;


       cout << "Enter section: ";
       cin >> section;
   }


   void get_details() {


       cout << "\nInformation of Student " << name << endl;
       cout << "Name: " << name << endl;
       cout << "Roll: " << roll << endl;
       cout << "Section: " << section << endl;
   }
};


int main() {


   Student student;
   student.set_details();
   student.get_details();


   return 0;
}
```

—---

By Java:

```
import java.util.Scanner;


class Student {


   private String name;
   private int roll;
   private String section;


   public void set_details () {


       Scanner scanner = new Scanner(System.in);
       System.out.println();


       System.out.print("Enter name of student : ");
       name = scanner.next();
       scanner.nextLine();


       System.out.print("Enter roll : ");
       roll = scanner.nextInt();


       System.out.print("Enter section : ");
       section = scanner.next();
       scanner.nextLine();


       scanner.close();
   }


   public void get_details() {


       System.out.println();
       System.out.println("Information of Student " +name);
       System.out.println("Name : " +name);
       System.out.println("Roll : " +roll);
       System.out.println("Section : " +section);
   }
}


public class Lab7 {
   public static void main(String[] args) {


       Student student = new Student();
       student.set_details();
       student.get_details();
   }
}
```

8.Write a program to calculate the volume of a sphere , cube and cylinder.(By C++ or Java)

By C++:

```
#include <iostream>
#include <cmath>
using namespace std;


class VolumeCalculator {
public:
   // Method to calculate volume of a sphere
   double volumeSphere(double radius) {
      return (4.0 / 3.0) * M_PI * pow(radius, 3);
   }
   // Method to calculate volume of a cube
   double volumeCube(double side) {
      return pow(side, 3);
   }
   // Method to calculate volume of a cylinder
   double volumeCylinder(double radius, double height) {
      return M_PI * pow(radius, 2) * height;
   }
};
int main() {
   VolumeCalculator calculator;
   double radius, side, height;


   // Sphere
   cout << "Enter the radius of the sphere: ";
   cin >> radius;
   cout<<"Volume of the sphere: "<<calculator.volumeSphere(radius)<<endl;
   // Cube
   cout << "Enter the side length of the cube: ";
   cin >> side;
   cout << "Volume of the cube: " << calculator.volumeCube(side) << endl;
   // Cylinder
   cout << "Enter the radius of the cylinder: ";
   cin >> radius;
   cout << "Enter the height of the cylinder: ";
   cin >> height;
   cout<<"Volume of the cylinder: "<<calculator.volumeCylinder(radius, height) << endl;
   return 0;
}
```

By Java:

```
import java.util.Scanner;
class VolumeCalculator {
   // Method to calculate volume of a sphere
   public double volumeSphere(double radius) {
       return (4.0 / 3.0) * Math.PI * Math.pow(radius, 3);
   }
   // Method to calculate volume of a cube
   public double volumeCube(double side) {
       return Math.pow(side, 3);
   }
   // Method to calculate volume of a cylinder
   public double volumeCylinder(double radius, double height) {
       return Math.PI * Math.pow(radius, 2) * height;
   }
}


public class Lab8 {
   public static void main(String[] args) {
       Scanner input = new Scanner(System.in);
       VolumeCalculator calculator = new VolumeCalculator();
       double radius, side, height;


       // Sphere
       System.out.println("Enter the radius of the sphere: ");
       radius = input.nextDouble();
       System.out.println("Volume of the sphere: " + calculator.volumeSphere(radius));


       // Cube
       System.out.println("Enter the side length of the cube: ");
       side = input.nextDouble();
       System.out.println("Volume of the cube: " + calculator.volumeCube(side));


       // Cylinder
       System.out.println("Enter the radius of the cylinder: ");
       radius = input.nextDouble();
       System.out.println("Enter the height of the cylinder: ");
       height = input.nextDouble();
       System.out.println("Volume of the cylinder: " + calculator.volumeCylinder(radius, height));
   }
}
```

9.Write a program to display the following pattern (By C++ or Java)

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

By C++:

```
#include <iostream>
#include <iomanip>
using namespace std;


// Function of Pascal's Triangle
void PascalsTriangle(int n) {
  int arr[n][n];


  //for space
  for (int line = 0; line < n; line++) {
     for (int i = 1; i < n-line; i++)
     {
        cout<<"  ";
     }

     for (int i = 0; i <= line; i++) {
        // First and last values in every row are 1
        if (line == i || i == 0) {
           arr[line][i] = 1;
        } else {
          // Other values are sum of values just above and left of above
           arr[line][i] = arr[line - 1][i - 1] + arr[line - 1][i];
        }
        // Print the current value with appropriate spacing
        cout << setw(4) << arr[line][i];
     }
     cout << endl;
  }
}


int main() {
  int n;
  // Number of lines
  cout<<"How many lines there are in your Pascal's triangle ?"<<endl;
  cin>>n;
  PascalsTriangle(n);
  return 0;
}
```

By Java:

```
import java.util.Scanner;


class Pascal{


  // Function of Pascal's Triangle
  public static void PascalsTriangle(int n) {
     int[][] arr = new int[n][n];


     for (int line = 0; line < n; line++) {
        //spaces for alignment
        for (int i = 1; i < n - line; i++) {
           System.out.print("  ");
        }


        for (int i = 0; i <= line; i++) {
           // First and last values in every row are 1
           if (line == i || i == 0) {
              arr[line][i] = 1;
           } else {
              // Other values are sum of values just above and left of above
              arr[line][i] = arr[line - 1][i - 1] + arr[line - 1][i];
           }
           // Print the current value with appropriate spacing
           System.out.printf("%4d", arr[line][i]);
        }
        System.out.println();
     }
  }
}


public class Lab9{
  public static void main(String[] args) {
     Scanner scanner = new Scanner(System.in);
     System.out.println("How many lines there are in your Pascal's triangle?");
     int n = scanner.nextInt();


     Pascal object = new Pascal();
     object.PascalsTriangle(n);
     scanner.close();
  }
  }
```

10.Write a program that takes marks in individual subjects from the user and calculate the GPA. (By C++ or Java)

By C++:

```
#include <iostream>
#include <string>
using namespace std;


class Grade {
   string subjectName;
   double marks;
public:
   Grade() {}
   void setData(string s, double m) {
       subjectName = s;
       marks = m;
   }
   string getName() {
       return subjectName;
   }
   double calGradepoint() const {
       double point;
       string result;


       if (marks >= 80 && marks <= 100) {
           point = 5.0;
           result = "A+";
       } else if (marks >= 75 && marks < 80) {
           point = 4.5;
           result = "A";
       } else if (marks >= 70 && marks < 75) {
           point = 4.0;
           result = "A-";
       } else if (marks >= 60 && marks < 70) {
           point = 3.5;
           result = "B+";
       } else if (marks >= 55 && marks < 60) {
           point = 3.0;
           result = "B";
       } else if (marks >= 50 && marks < 55) {
           point = 2.5;
           result = "C";
       } else if (marks >= 40 && marks < 50) {
           point = 2.0;
           result = "D";
       } else if (marks >= 0 && marks < 40) {
           point = 0.0;
           result = "F";
       }


       cout << "Your gradepoint in " << subjectName << " = "<<point<< "\n";
       cout << "You got " << result << " in " << subjectName << endl;
       return point;
   }
```

```
    static double calculateGPA(Grade *ptr, int size) {
        double GPA = 0.0;
        for (int i = 0; i < size; ++i) {
            GPA += (ptr + i)->calGradepoint();
        }
        return GPA / size;
    }
};

int main() {
    int size;
    cout << "How many subjects do you have?" << "\n";
    cin >> size;


    string sub;
    double score;


    Grade *ptr = new Grade[size];
    for (int i = 0; i < size; i++) {
        cout << "Enter the subject name and score: " << endl;
        cin >> sub >> score;
        (ptr + i)->setData(sub, score);
    }
    cout << "------------" << endl;


    double GPA = Grade::calculateGPA(ptr, size);
    cout << "Your overall GPA is = " << GPA << endl;


    delete[] ptr;
    return 0;
}
```

—---

By Java:

```
import java.util.Scanner;
class Grade {
    String subjectName;
    double marks;
    public Grade() {}
    public void setData(String s, double m) {
        subjectName = s;
        marks = m;
    }
    public String getName() {
        return subjectName;
    }
    public double calGradepoint() {
        double point;
        String result;


        if (marks >= 80 && marks <= 100) {
            point = 5.0;
            result = "A+";
        } else if (marks >= 75 && marks < 80) {
            point = 4.5;
            result = "A";
        } else if (marks >= 70 && marks < 75) {
            point = 4.0;
            result = "A-";
        } else if (marks >= 60 && marks < 70) {
            point = 3.5;
            result = "B+";
        } else if (marks >= 55 && marks < 60) {
            point = 3.0;
            result = "B";
        } else if (marks >= 50 && marks < 55) {
            point = 2.5;
            result = "C";
        } else if (marks >= 40 && marks < 50) {
            point = 2.0;
            result = "D";
        } else if (marks >= 0 && marks < 40) {
            point = 0.0;
            result = "F";
        } else {
            point = 0.0;
            result = "Invalid marks";
        }
        System.out.println("Your gradepoint in " + subjectName + " = " + point);
        System.out.println("You got " + result + " in " + subjectName);
        return point;
    }
    public static double calculateGPA(Grade[] grades) {
        double GPA = 0.0;
        for (Grade grade : grades) {
            GPA += grade.calGradepoint();
        }
        return GPA / grades.length;
    }
}
public class Lab10 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        System.out.print("How many subjects do you have? ");
        int size = scanner.nextInt();


        Grade[] grades = new Grade[size];
        scanner.nextLine(); // Consume newline


        for (int i = 0; i < size; i++) {
            System.out.print("Enter the subject name and score: ");
            String sub = scanner.next();
            double score = scanner.nextDouble();
            scanner.nextLine(); // Consume newline
            grades[i] = new Grade();
            grades[i].setData(sub, score);
        }
        System.out.println("------------");
        double GPA = Grade.calculateGPA(grades);
        System.out.println("Your overall GPA is = " + GPA);
    }
}
```

11.Write a program that uses a constructor to initialize data members of a class representing a simple banking account.(Show owner names, primary balance, withdraws and updated account information). (By C++ or Java)

By C++:

```
#include <iostream>
#include <string>
using namespace std;


class BankAccount {
private:
    string ownerName;
    double balance;


public:
    // Constructor to initialize the ownerName and balance
    BankAccount(const string& name, double initialBalance) {
        ownerName = name;
        balance = initialBalance;
    }


    // Function to display account information
    void displayInfo() const {
        cout << "Owner Name: " << ownerName << endl;
        cout << "Balance: $" << balance << endl;
    }


    // Function to deposit money into the account
    void deposit(double amount) {
        balance += amount;
        cout << "Deposit of $" << amount << " successful." << endl;
    }


    // Function to withdraw money from the account
    void withdraw(double amount) {
        if (balance >= amount) {
            balance -= amount;
            cout << "Withdrawal of $" << amount<<" successful."<<endl;
        } else {
            cout << "Insufficient funds!" << endl;
        }
    }
};
```

```
int main() {
   string name;
   double initialBalance;
   double depositAmount;
   double withdrawAmount;


   // Get the owner name and initial balance from the user
   cout << "Enter owner name: ";
   getline(cin, name);


   cout << "Enter initial balance: ";
   cin >> initialBalance;


   // Creating a BankAccount object with initial values using the constructor
   BankAccount account(name, initialBalance);


   // Display initial account information
   cout << "\nInitial Account Information:" << endl;
   account.displayInfo();
   cout << endl;


   // Get deposit amount from the user and perform deposit
   cout << "Enter amount to deposit: ";
   cin >> depositAmount;
   account.deposit(depositAmount);


   // Get withdraw amount from the user and perform withdrawal
   cout << "Enter amount to withdraw: ";
   cin >> withdrawAmount;
   account.withdraw(withdrawAmount);


   // Display updated account information
   cout << "\nUpdated Account Information:" << endl;
   account.displayInfo();


   return 0;
}
```

——---

By Java:

```
import java.util.Scanner;


class BankAccount {
   private String ownerName;
   private double balance;
   // Constructor to initialize the ownerName and balance
   public BankAccount(String name, double initialBalance) {
      ownerName = name;
      balance = initialBalance;
   }


   // Display account information
   public void displayInfo() {
      System.out.println("Owner Name: " + ownerName);
      System.out.println("Balance: $" + balance);
   }


   public void deposit(double amount) {
      balance += amount;
      System.out.println("Deposit of $" + amount + " successful.");
   }


   public void withdraw(double amount) {
      if (balance >= amount) {
         balance -= amount;
         System.out.println("Withdrawal of $" + amount + " successful.");
      } else {
         System.out.println("Insufficient funds!");
      }
   }
}


public class Lab11 {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      BankAccount account = null;


      // Get the owner name and initial balance from the user
      System.out.print("Enter owner name: ");
      String name = scanner.nextLine();


      System.out.print("Enter initial balance: ");
      double initialBalance = scanner.nextDouble();
      scanner.nextLine(); // Consume newline


      // Creating a BankAccount object with initial values using the constructor
      account = new BankAccount(name, initialBalance);


      // Display initial account information
      System.out.println("\nInitial Account Information:");
      account.displayInfo();
      System.out.println();


      // Get deposit amount from the user and perform deposit
```

```
        System.out.print("Enter amount to deposit: ");
        double depositAmount = scanner.nextDouble();
        account.deposit(depositAmount);


        // Get withdraw amount from the user and perform withdrawal
        System.out.print("Enter amount to withdraw: ");
        double withdrawAmount = scanner.nextDouble();
        account.withdraw(withdrawAmount);


        // Display updated account information
        System.out.println("\nUpdated Account Information:");
        account.displayInfo();


        scanner.close();
    }
}
```

12.Write a program creating a super-class with variable “name” and “age”, and a method display();and create a subclass with variable “salary”.Now inherit the subclass to print the name,salary and age. (By C++ or Java)

By C++:

```
#include <iostream>
#include <string>
using namespace std;
class Person {
protected:
    string name;
    int age;
public:
    Person(string name, int age) : name(name), age(age) {}
    void display() {
        cout << "Name: " << name << endl;
        cout << "Age: " << age << endl;
    }
};
class Employee : public Person {
private:
    double salary;
public:
    Employee(string name, int age, double salary) : Person(name, age), salary(salary) {}
    void displaySalary() {
        cout << "Salary: $" << salary << endl;
    }
};


int main() {
    string name;
    int age;
    double salary;
    cout<<"What is your name :";
    cin>>name;
    cout<<"Your age : ";
    cin>>age;
    cout<<"Your salary : ";
    cin>>salary;


    cout<<"---------------"<<endl;
    Employee emp(name, age, salary);
    emp.display();
    emp.displaySalary();
    return 0;
}
```

—--

By Java:

```
import java.util.Scanner;


class Person {
    protected String name;
    protected int age;


    public Person(String name, int age) {
        this.name = name;
        this.age = age;
    }


    public void display() {
        System.out.println("Name: " + name);
        System.out.println("Age: " + age);
    }
}


class Employee extends Person {
    private double salary;


    public Employee(String name, int age, double salary) {
        super(name, age);
        this.salary = salary;
    }


    public void displaySalary() {
        System.out.println("Salary: $" + salary);
    }
}


public class Lab12 {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);


        System.out.print("What is your name: ");
        String name = scanner.next();
        System.out.print("Your age: ");
        int age = scanner.nextInt();
        System.out.print("Your salary: ");
        double salary = scanner.nextDouble();


        System.out.println("---------------");


        Employee emp = new Employee(name, age, salary);
        emp.display();
        emp.displaySalary();


        scanner.close();
    }
}
```

13.Write a program to perform addition, substruction, multiplication and division using GUI.

Solution:

```
import javax.swing.*;
import java.awt.event.*;


public class TextFieldExample implements ActionListener {
    JTextField tf1, tf2, tf3;
    JButton b1, b2, b3, b4; // b3 for multiplication, b4 for division



    TextFieldExample() {
        JFrame f = new JFrame();

        tf1 = new JTextField();
        tf1.setBounds(50, 50, 250, 25);
        tf2 = new JTextField();
        tf2.setBounds(50, 100, 250, 25);
        tf3 = new JTextField();
        tf3.setBounds(50, 150, 250, 25);
        tf3.setEditable(false);
        b1 = new JButton("+");
        b1.setBounds(50, 200, 50, 50);
        b2 = new JButton("-");
        b2.setBounds(120, 200, 50, 50);
        b3 = new JButton("*"); // multiplication button
        b3.setBounds(190, 200, 50, 50);
        b4 = new JButton("/"); // division button
        b4.setBounds(260, 200, 50, 50);


        b1.addActionListener(this);
        b2.addActionListener(this);
        b3.addActionListener(this);
        b4.addActionListener(this);


        f.add(tf1);
        f.add(tf2);
        f.add(tf3);
        f.add(b1);
        f.add(b2);
        f.add(b3);
        f.add(b4);


        f.setSize(800, 600);
        f.setLayout(null);
        f.setVisible(true);
    }


    public void actionPerformed(ActionEvent e) {
        String s1 = tf1.getText();
        String s2 = tf2.getText();
        double a = Double.parseDouble(s1);
        double b = Double.parseDouble(s2);
        double c = 0;
        if (e.getSource() == b1) {
            c = a + b;
        } else if (e.getSource() == b2) {
            c = a - b;
        } else if (e.getSource() == b3) {
            c = a * b;
        } else if (e.getSource() == b4) {
            if (b != 0) {
                c = a / b;
            } else {
                tf3.setText("Error: Division by zero");
                return;
            }
        }
        // Format the result to display only two decimal places
        String result = String.format("%.2f", c);
        tf3.setText(result);
    }


    public static void main(String[] args) {
        new TextFieldExample();
    }
}
```

14.Write a program to perform “counting string and word” using GUI.

Solution:

```
import javax.swing.*;
import java.awt.event.*;
public class TextAreaExample implements ActionListener{
JLabel l1,l2;
JTextArea area;
JButton b;
TextAreaExample() {
   JFrame f= new JFrame();
   l1=new JLabel();
   l1.setBounds(50,25,100,30);
   l2=new JLabel();
   l2.setBounds(160,25,100,30);
   area=new JTextArea();
   area.setBounds(20,75,300,200);
   b=new JButton("Count Words");
   b.setBounds(100,300,150,30);
   b.addActionListener(this);
   f.add(l1);f.add(l2);f.add(area);f.add(b);
   f.setSize(450,450);
   f.setLayout(null);
   f.setVisible(true);
}
public void actionPerformed(ActionEvent e){
   String text=area.getText();
   String words[]=text.split("\\s");
   l1.setText("Words: "+words.length);
   l2.setText("Characters: "+text.length());
}
public static void main(String[] args) {
   new TextAreaExample();
}
}
```