INTERNALS.JAVA

```
package CIE;
import java.util.Scanner;

public class Internals extends Student {
   protected int[] marks = new int[5];  // Marks for 5 courses

   public void inputCIEmarks() {
      Scanner scanner = new Scanner(System.in);
      System.out.println("Enter Internal marks for 5 courses:");
      for (int i = 0; i < 5; i++) {
         System.out.print("Enter marks for Course " + (i + 1) + ": ");
         marks[i] = scanner.nextInt();
      }
   }

   public void displayCIEmarks() {
      System.out.println("Internal Marks for 5 courses:");
      for (int i = 0; i < 5; i++) {
         System.out.println("Course " + (i + 1) + ": " + marks[i]);
      }
   }
}
```

STUDENT.JAVA

```
package CIE;
import java.util.Scanner;
public class Student {
   protected String usn;
   protected String name;
   protected int sem;

   public void inputStudentDetails() {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter USN: ");
      usn = scanner.nextLine();
      System.out.print("Enter Name: ");
      name = scanner.nextLine();
      System.out.print("Enter Semester: ");
      sem = scanner.nextInt();
   }

   public void displayStudentDetails() {
      System.out.println("USN: " + usn);
      System.out.println("Name: " + name);
      System.out.println("Semester: " + sem);
   }
}
```

EXTERNALS.JAVA

```
package SEE;
import CIE.Internals;
import java.util.Scanner;

public class Externals extends Internals {
   protected int[] externalMarks = new int[5];
   protected int[ ] finalMarks = new int[5];

   public Externals() {
      marks = new int[5];
      externalMarks = new int[5];
      finalMarks = new int[5];
   }

   public void inputSEEmarks() {
      Scanner scanner = new Scanner(System.in);
      System.out.println("Enter External marks for 5 courses:");
      for (int i = 0; i < 5; i++) {
         System.out.print("Enter marks for Course " + (i + 1) + ": ");
         externalMarks[i] = scanner.nextInt();
      }
   }

   public void calculateFinalMarks() {
      for (int i = 0; i < 5; i++) {
         finalMarks[i] = marks[i] + externalMarks[i];
      }
   }

   public void displayFinalMarks() {
      displayStudentDetails();
      displayCIEmarks();
      System.out.println("Final Marks (Internal + External) for 5 courses:");
      for (int i = 0; i < 5; i++) {
         System.out.println("Course " + (i + 1) + ": " + finalMarks[i]);
      }
   }
```

MAIN.JAVA

```
import SEE.Externals;
import java.util.Scanner;

public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter the number of students: ");
      int n = scanner.nextInt();

      Externals[] students = new Externals[n];
```

```
        for (int i = 0; i < n; i++) {
            students[i] = new Externals();

            System.out.println("Enter details for student " + (i + 1));
            students[i].inputStudentDetails();
            students[i].inputCIEmarks();
            students[i].inputSEEmarks();
            students[i].calculateFinalMarks();
        }
        for(int i=0; i<n; i++){
             students[i].displayFinalMarks();
             System.out.println();
        }
    }
}
```

```
D:\1BM23CS321\Package>java Main.java
Enter the number of students: 1
Enter details for student 1
Enter USN: 1BM23CS321
Enter Name: Shreyas
Enter Semester: 3
Enter Internal marks for 5 courses:
Enter marks for Course 1: 45
Enter marks for Course 2: 43
Enter marks for Course 3: 48
Enter marks for Course 4: 50
Enter marks for Course 5: 39
Enter External marks for 5 courses:
Enter marks for Course 1: 45
Enter marks for Course 2: 50
Enter marks for Course 3: 44
Enter marks for Course 4: 34
Enter marks for Course 5: 41
USN: 1BM23CS321
Name: Shreyas
Semester: 3
Internal Marks for 5 courses:
Course 1: 45
Course 2: 43
Course 3: 48
Course 4: 50
Course 5: 39
Final Marks (Internal + External) for 5 courses:
Course 1: 90
Course 2: 93
Course 3: 92
Course 4: 84
Course 5: 80
```

Q Create Package CIE which has two classes – Student and Internals. The class personal has members like usn, name, sem. The class internals has an array that stores the internal marks scored in 5 courses of the current semester. Create package SEE which has the class External which is a derived class of Student. This class has an array that stores the SEE marks scored in five courses of the current semester of the student.

(*) Student.Java

```
package CIE;
import java.util.Scanner;
public class Student {
        protected String usn;
        protected String name;
        protected int sem;

        public void inputStudentDetails() {
                Scanner sc = new Scanner(System.in);
                System.out.print("Enter USN:");
                usn = sc.nextLine();
                System.out.print("Enter Name:");
                name = sc.nextLine();
                System.out.print("Enter Semester:");
                sem = sc.nextInt();

        public void displayDetails() {
                System.out.println("USN:" + usn);
                System.out.println("Name:" + name);
                System.out.println("Semester:" + sem);
```

* Internals.java

```
package CIE;
import java.util.Scanner;
public class Internals extends Student {
        protected int[] marks = new int[5];
        public void inputMarks() {
                Scanner sc = new Scanner(System.in);
                System.out.println("Enter Internal marks:");
                for(int i=0; i<5; i++) {
                        System.out.println("Enter marks:");
                        marks[i] = sc.nextInt();
                }
        }
        public void displayMarks() {
                System.out.println("Internal Marks are:");
                for(int i=0; i<5; i++) {
                        System.out.println("course"+(i+1)+":"+
                                marks[i]);
                }
        }
}
```

(*) Externals.java

```
package SEE;
import CIE. Internals :
import java.util.Scanner;
public class Externals extends Internals {
        protected int [] externalMarks = new int [5] ;
        protected int [] finalMarks = new int [5];

    public Externals () {
            marks = new int [5] ;
            externalMarks = new int [5] ;
            finalMarks = new int [5] ;

        public void inputSEEMarks () {
                Scanner sc = new Scanner (System.in) ;
                System.out.println ("Enter Marks :") ;
                for (int i=0 ; i<5 ; i++) {
                    System.out.println ("Enter Marks"+
                                        (i+1));
                    externalMarks [i] = sc. nextInt() ;
                }
        }

    public void calculateFinalMarks () {
            for (int i=0 ; i<5 ; i++) {
                finalMarks [i] = marks [i]+
                                 externalMarks [i]
    }
}

public void displayFinalMarks () {
        displayStudentDetails () ;
        displayCIEMarks () ;
        System.out.println ("Final Marks :");
        for (int i=0 ; i<5 ; i++) {
            System ("Course" + (i+1) + ":");
        }
    }
}
```

(#) Main.java

```
import SEE.Externals;
import java.util.Scanner;
public class Main {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the numbers:");
        int n = sc.nextInt();
        Externals[] students = new Externals[n];
        for(int i=0; i<n; i++) {
            Student[i] = new Externals();
            System.out.println("Details");
            Students[i].inputDetails();
            students[i].inputMarks();
            Students[i].SEEMarks();
            Students[i].calculateTotal();
        }

        for(int i=0; i<n; i++) {
            Students[i].displayFinal();
            System.out.println();
        }
    }
}
```

Output ⇒

```
Enter Number of Students : 1
Name : Shreyas
USN : 1BM23CS321
Semester : 3
Enter Marks for 5 courses
course 1 : 45
course 2 : 43
course 3 : 48
course 4 : 50
course 5 : 39
Enter SEE marks :
course 1 : 45
course 2 : 50
course 3 : 44
course 4 : 34
course 5 : 41
Final Marks (Internal + External ) :
course 1 : 90
course 2 : 93
course 3 : 92
course 4 : 84
course 5 : 80
```

o/p seen
Thu
21/11/24