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: 1BM23CS316
Enter Name: Shonal
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: Shonal
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 - Students 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;
    protected void inputMarks(){
        Scanner sc=new Scanner
            (System.in);
        System.out.println("Enter
            Internals 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]);
    }
}
```

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(A5) 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.nextIn
        }
    }
```

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

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

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④ 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
            number:");
        int n = sc.nextInt();
        External[] students = new External[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 : Sharal
USN : 1BM23CS316
Number : 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