```
package SEE;


import java.util.Scanner;

import CIE.Student;


public class Externals extends CIE.Student

{

	public int n = 5;

	public int see[] = new int[n];

	public int i;

	Scanner ss = new Scanner(System.in);


	public void acceptsee()

	{

		System.out.println("\n<-----SEE MARKS DETAILS----->\n");

		System.out.println("Enter the marks in each of the "+n+" subjects :");

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

		{

			System.out.print("Enter the SEE marks in subject "+(i+1)+" : ");

			see[i] = ss.nextInt();

		}

	}

}
```

```
package CIE;

import java.util.Scanner;

public class Internals extends Student
{
	public int n = 5;
	public int cie[] = new int[n];
	public int i;
	Scanner ss = new Scanner(System.in);

	public void acceptcie()
	{
		System.out.println("\n<-----CIE MARKS DETAILS----->\n");
		System.out.println("Enter the marks in each of the "+n+" subjects :");
		for(i = 0; i < n; i++)
		{
			System.out.print("Enter the CIE marks in subject "+(i+1)+" : ");
			cie[i] = ss.nextInt();
		}
	}
}
```

```
package CIE;

import java.util.Scanner;

public class Student
{
	public String usn;
	public String name;
	public int sem;
	Scanner ss = new Scanner(System.in);

	public Student()
	{
		usn = "";
		name = "";
		sem = 0;
	}

	public void accept()
	{
		System.out.println("\n<-----ENTER PERSONAL DETAILS----->\n");
		System.out.println("Enter the student USN :");
		usn = ss.next();
		System.out.println("Enter the student NAME :");
		name = ss.next();
		System.out.println("Enter the student SEMESTER :");
		sem = ss.nextInt();
```

```
import CIE.*;
import SEE.*;
import java.util.Scanner;

class Totalmarks
{
	public static void main(String[] args)
	{
		int n;
		int tot[][];
		Scanner ss = new Scanner(System.in);
		System.out.println("Enter the number of students : ");
		n = ss.nextInt();
		tot = new int[n][5];
		CIE.Internals ci[] = new CIE.Internals[n];
		SEE.Externals se[] = new SEE.Externals[n];
		for(int i = 0; i < n; i++)
		{
			System.out.println("\n<----------DETAILS OF STUDENT "+(i+1)+"---------->");
			ci[i] = new CIE.Internals();
			se[i] = new SEE.Externals();
			ci[i].accept();
			ci[i].acceptcie();
			se[i].acceptsee();
			for(int j = 0; j < 5; j++)
			{
				tot[i][j] = ci[i].cie[j] + (se[i].see[j] / 2);
```

```
                }
            }
            System.out.println("<---------------------------------------->");
            for(int i = 0; i < n; i++)
            {
                System.out.println("\nSTUDENT "+(i+1)+" FINAL MARKS OUT OF 100\n");
                for(int j = 0; j < 5; j++)
                {
                    System.out.println("Marks in Course "+(j+1)+" : "+tot[i][j]);
                }
            }
            System.out.println("<---------------------------------------->\n");
        }
}
```

```
Package CIE;

import java.util.Scanner;
public class Student
  {
     public String usn;
     public String name;
     public int sem;
  Scanner ss = new Scanner (System.in);

   public Student()
{
   usn = "  ";
   name = "  ";
    sem = 0;
 }
     public void accept()
{
System.out.println ("\n enter personal details \n");
System.out.println (" enter USN");
    USN = ss.next();
System.out.println (" enter name : ");
     name = ss.next();
System.out.println (" enter the Semester \n");
     sem = ss.next.Int();
}
}
```

```
package CIE;
import java.util.Scanner;
public class Internals extend Student
 {
   public int n=5;
    public int cie[] = new int[n];
     public int i;
Scanner ss = new Scanner (System.in);
     public void accept cie()
{
 System.out.println("\n CIE mark details \n");
System.out.println("enter the marks in each of the "+n+"
                                  subjects :");
     for(i= 0; i<n; i++)
  {
    System.out.println("enter the cie marks in subject"
                                  +(i+1)+ " : ");
        cie [i] = ss.nextInt ();
   }
   }
   }
```

```
package see;

import java.util.Scanner;
import cie.Student;

public class externals extends cie.student
{
  public int n=5;
  public int sec[] = new int[n];
  public int i;
Scanner ss = new Scanner(System.in);

  public void accept see()
{
System.out.println("\n see marks details \n");
System.out.println(" enter the marks of each of the
                    +n+ subjects :");
for(i=0; i<n; i++)
{
System.out.print(" enter the see mark in Subject
                    + (i+1) + " : ");
    sec[i] = ss.nextInt();
}
}
}
```

```
import cie.*;
import see.*;
import java.util.Scanner;
Class Totalmarks
{
  public static void main (String[] args)
{
  int n;
  int tot[][]
Scanner ss = new Scanner (System.in);
System.out.println(" enter the no of students \n");
   n = ss.next Int ();
tot = newint [n][5];
Cie.externals ci[] = new cie.Internals[n];
see. externals se[] = new see. externals [n];
   for (int i = 0; i<n; i++)
{
System.out. println(" details of student "+(i+1)"+ )");
   ci [i] = new cie. Internals ();
   se [i] = new see. externals ();
   ci[i]. accept ();
   ci[i].acceptcie();
   se[i]. acceptSee();
  for (int j = 0; j<5; i++)
{
 tot [i] [j] = ci[i]. cie[j] + ( se [i]. see[j]/2)
  }
  }
```

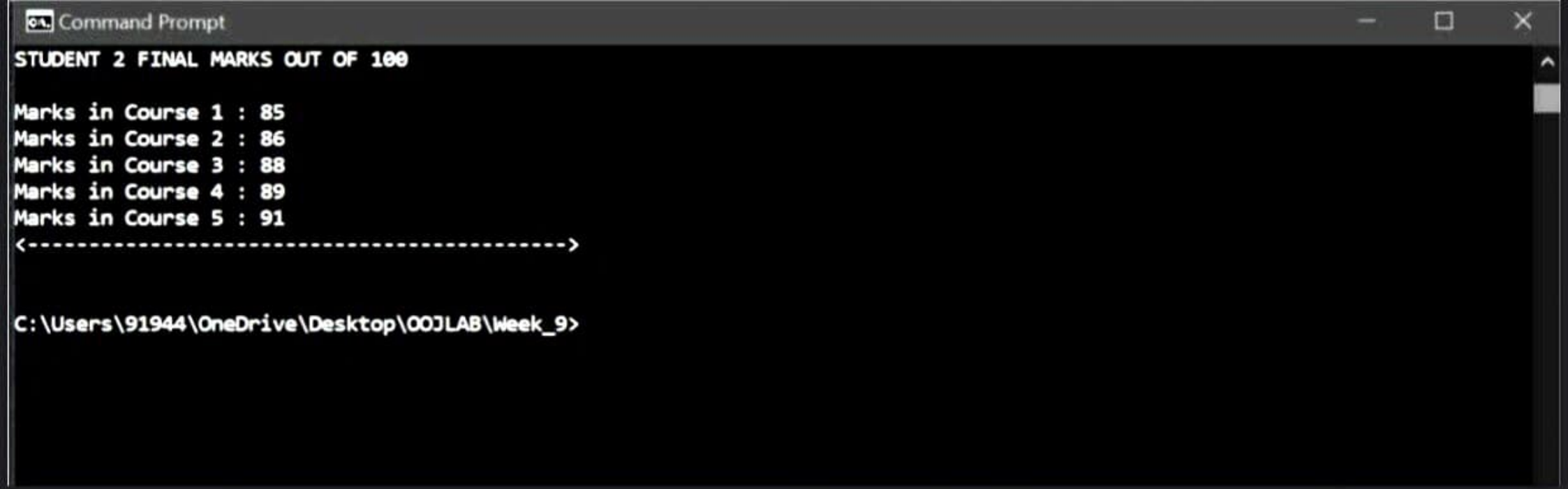
```
System.out.print("----------");
    for(int i=0; i<n; i++)
  {
    System.out.println("\n Student " + (i+1) + "
     "final marks out of 100 \n");
    for(int j=0; j<5; j++)
{
  System.out.println(" marks in course " + (j+1)
                    + " : " + tot[i][j]);
      }
    }
System.out.println("----------");
      }
    }
```

Command Prompt

```
C:\Users\91944\OneDrive\Desktop\OOJLAB\Week_9>java Totalmarks
Enter the number of students :
2

<----------DETAILS OF STUDENT 1---------->

<-----ENTER PERSONAL DETAILS----->

Enter the student USN :
111
Enter the student NAME :
Ram
Enter the student SEMESTER :
3

<-----CIE MARKS DETAILS----->

Enter the marks in each of the 5 subjects :
Enter the CIE marks in subject 1 : 45
Enter the CIE marks in subject 2 : 46
Enter the CIE marks in subject 3 : 47
Enter the CIE marks in subject 4 : 48
Enter the CIE marks in subject 5 : 49

<-----SEE MARKS DETAILS----->

Enter the marks in each of the 5 subjects :
Enter the SEE marks in subject 1 : 95
Enter the SEE marks in subject 2 : 96
Enter the SEE marks in subject 3 : 97
Enter the SEE marks in subject 4 : 98
Enter the SEE marks in subject 5 : 99
```

Command Prompt

```
<----------DETAILS OF STUDENT 2---------->

<-----ENTER PERSONAL DETAILS----->

Enter the student USN :
222
Enter the student NAME :
Shyam
Enter the student SEMESTER :
3

<-----CIE MARKS DETAILS----->

Enter the marks in each of the 5 subjects :
Enter the CIE marks in subject 1 : 40
Enter the CIE marks in subject 2 : 41
Enter the CIE marks in subject 3 : 42
Enter the CIE marks in subject 4 : 43
Enter the CIE marks in subject 5 : 44

<-----SEE MARKS DETAILS----->

Enter the marks in each of the 5 subjects :
Enter the SEE marks in subject 1 : 90
Enter the SEE marks in subject 2 : 91
Enter the SEE marks in subject 3 : 92
Enter the SEE marks in subject 4 : 93
Enter the SEE marks in subject 5 : 94
<---------------------------------------->

STUDENT 1 FINAL MARKS OUT OF 100

Marks in Course 1 : 92
Marks in Course 2 : 94
Marks in Course 3 : 95
Marks in Course 4 : 97
Marks in Course 5 : 98
```


Command Prompt
STUDENT 2 FINAL MARKS OUT OF 100
Marks in Course 1 : 85
Marks in Course 2 : 86
Marks in Course 3 : 88
Marks in Course 4 : 89
Marks in Course 5 : 91
<--->
C:\Users\91944\OneDrive\Desktop\OOJLAB\Week_9>

```java
import java.util.*;
class Wrongage extends Exception{
    private String detail;
    Wrongage(String s)
    {
        detail=s;
    }
    public String toString(){
        return ("invalid age exception"+detail);
    }
}
class Father{
    int age;
    Father(int a){
        age=a;
    }
}
class Son extends Father{
    int age1;
    Son(int a,int b)
    {
        super(a);
        age1=b;
    }
}
public class abc{
    public static void main(String[] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("enter the age of father and son respectively");
```

```
29          System.out.println("enter the age of father and son respectively");
30          int m=sc.nextInt();
31          int n=sc.nextInt();
32          try{
33          if(m<0)
34                  throw new Wrongage("negative");
35          else if(n>=m)
36                  throw new Wrongage("illogical");
37          else
38          {
39              Son ob=new Son(m,n);
40              System.out.println("father's age:"+ob.age+"son's age"+ob.age1);
41              }
42          }
43          catch (Wrongage e){
44          System.out.println(e);
45      }
46  }
47  }
```

Result

compiled and executed in 54.49 sec(s)

```
enter the age of father and son respectively
10
25
invalid age exceptionillogical
```

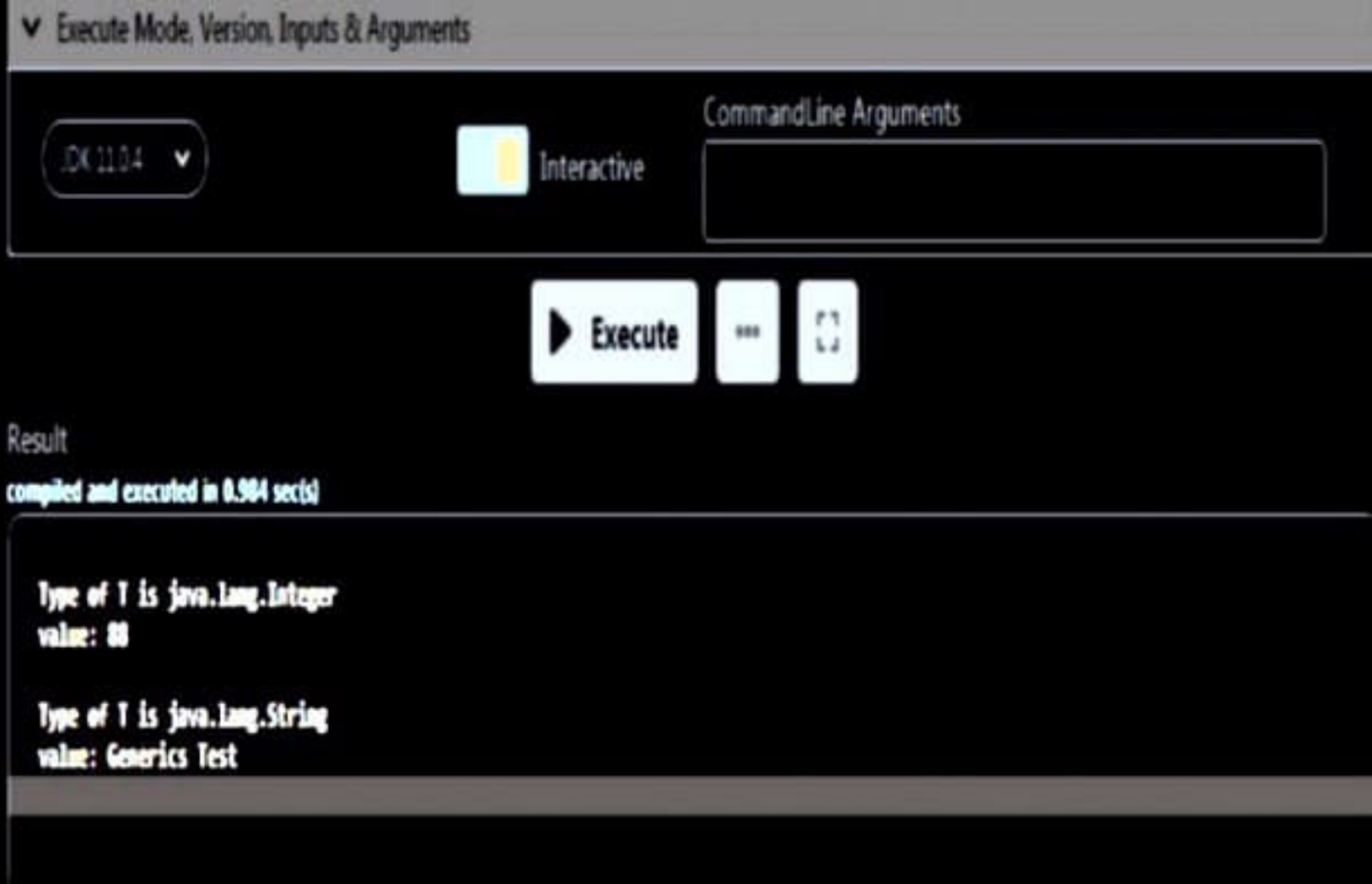
```
import java.util.*;
class Wrongage extends exception {
private String details;
  wrongage (String s)
{
  details = s;
}

  public String toString()
{
  return ("Invalid age exception" + detail);
}
}

  class father {
int age;
  father (int a)
  {
    age = a;
}
}

class son extends father {
int age1;
son (int a, int b)
  {
    super (a);
    age1 = b;
  }

}
```

```
public class abc {
public static void main (String[] args)
{
Scanner sc = new Scanner (System.in);
System.out.println ("enter the age of the father and
    the son respectively");
int m = sc.nextInt();
int n = sc.nextInt();
try {
  if (m<0)
  throw new Wrongage ("negative");
else if (n>=m)
  throw new Wrongage ("illogical");
else
{
  son ab = new son(m, n);
System.out.println (" Father's age :" + ab.age +
  "son's age :" + ob.age);
}
  catch (Wrongage e)
{
System.out.println (e);
}
}
}
```

Project Name: generic

```
class Gen<T> {

T ob; // declare an object of type T

// Pass the constructor a reference to

// an object of type T.

Gen(T o) {

ob = o;

}

// Return ob.

T getob() {

return ob;

}

// Show type of T.

void showType() {

System.out.println("Type of T is " +

ob.getClass().getName());

}

}

public class GenDemo {

public static void main(String args[]) {

Gen<Integer> iob;

iob = new Gen<Integer>(88);

iob.showType();
```

```
43  iob.showType();
44
45  // Get the value in iOb. Notice that
46
47  // no cast is needed.
48
49  int v = iob.getob();
50
51  System.out.println("value: " + v);
52
53  System.out.println();
54
55  // Create a Gen object for Strings.
56
57  Gen<String>strOb = new
58  Gen<String>("Generics Test");
59
60  // Show the type of data used by strOb.
61
62  strOb.showType();
63
64  // Get the value of strOb. Again, notice
65
66  // that no cast is needed.
67
68  String str = strOb.getob();
69
70  System.out.println("value: " + str);
71
72  }
73
74  }
75
```


Execute Mode, Version, Inputs & Arguments
JDK 11.0.4
Interactive
CommandLine Arguments
Execute
Result
compiled and executed in 0.984 sec(s)
Type of T is java.Lang.Integer
value: 88
Type of T is java.Lang.String
value: Generics Test

```
class Gen<T>
{
 Tob;
 Gen ( T o)
 {
  ob = o;
 }
  T get ob ( )
 {
   return ob;
 }
  void showType ( )
 {
 System.out.println ("Type of T is" + ob.getclass( ).
        getName) ;
}}
```

```
  public class GenDemo {
  public static void main ( string [ ] args)
   {
    Gen < Integer > iob;
iob = new Gen <Integer>(88);
iob =  showType ( );
 int v = iob. get ob ( );
System.out. println (" value :" + v);
 System.out. println ( )";
 Gen <string> strob = new
 Gen <string> ("Generic Test");
   strob. showType ( );
 String str. strob. getob ( );
 System.out. println ("value :" + str);
  } }
```

```
class thread1 implements Runnable
{
    Thread t;
    thread1()
    {
        t = new Thread(this,"thread1");
        t.start();
    }

    public void run()
    {
     for(;;)
    {
         try
         {
            System.out.println("BMS College Of Engineering");
            Thread.sleep(10000);
         }
        catch(InterruptedException ie)
        {
            System.out.println("Interrupted");
        }
    }
  }
}

class thread2 implements Runnable
{
    Thread t2;
    thread2()
    {
        t2 = new Thread(this,"thread2");
        t2.start();

    }
```

```
35      }
36
37      public void run()
38      {   for(;;)
39      {
40          try
41          {
42              System.out.println("CSE");
43              Thread.sleep(2000);
44          }
45          catch(InterruptedException ie)
46          {
47              System.out.println("Interrupted");
48          }
49      }
50    }
51  }
52
53  public class threadmain
54  {
55      public static void main(String args[])
56      {
57         System.out.println("Enter CONTROL+C to stop");
58          thread1 t1 = new thread1();
59          thread2 t2 = new thread2();
60
61      }
62  }
```

Result

compiled and executed in 120.593 sec(s)

```
Enter CONTROL+C to stop
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
CSE
CSE
CSE
CSE
BMS College Of Engineering
CSE
```