

ASSIGNMENT – 1

Subject: CSW2 (CSE 2141)

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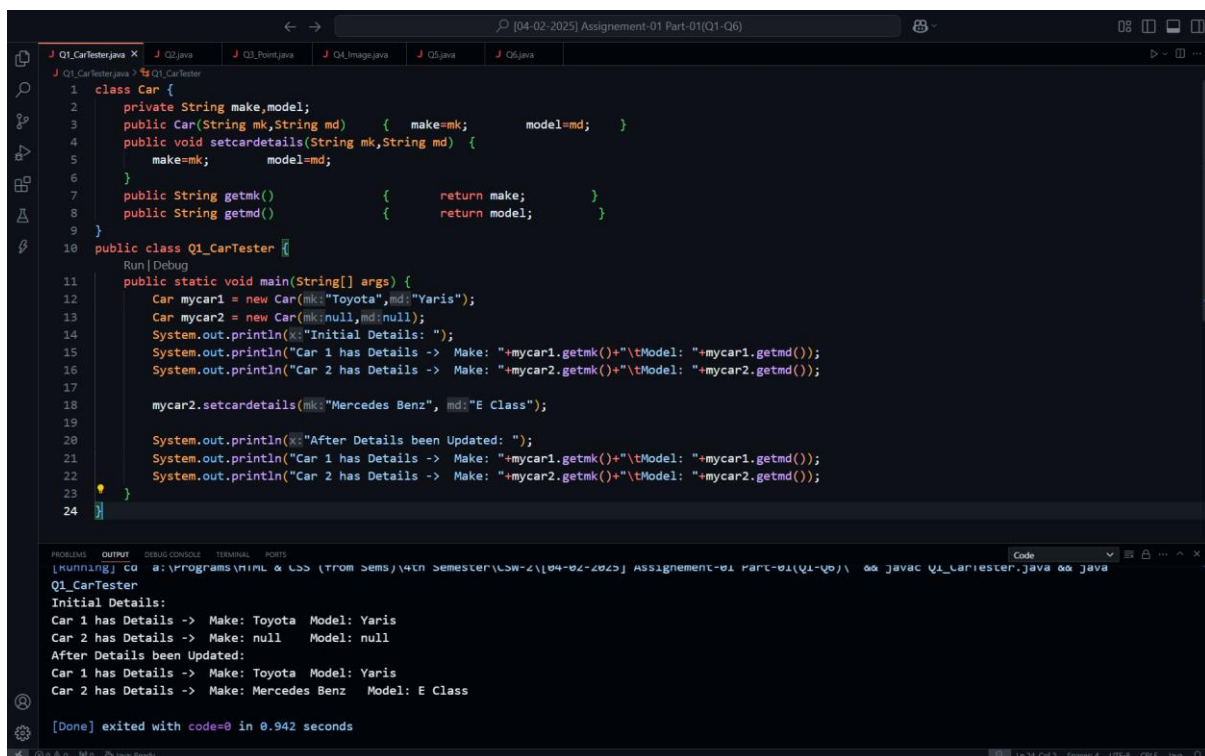
Registration Number: 2341013237

Section: 23412G1

Branch: CSE

Q1. Write a Java program with a Car class having private fields (make, model), a parameterized constructor, getter, and setter methods. In the CarTester class, instantiate myCar1 with values and myCar2 with null. Print their initial details, update myCar2 using setters, and print the updated details.

Solution along with Output:



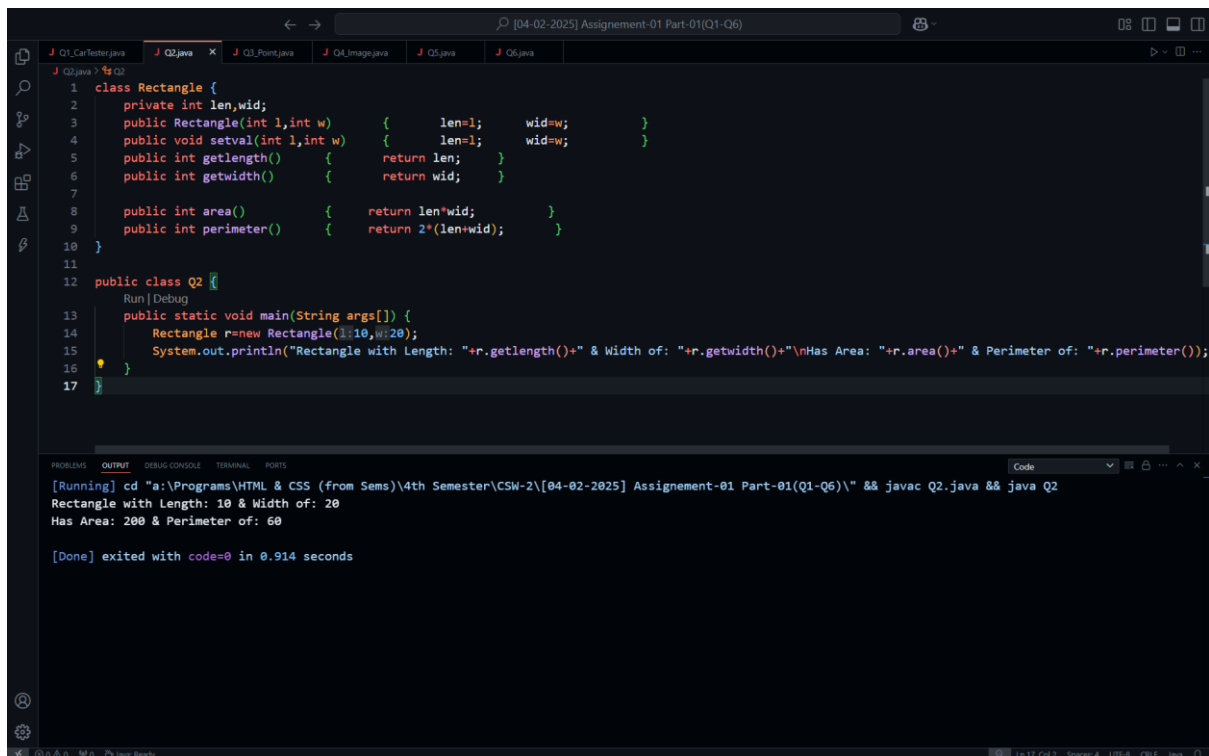
```
1 class Car {
2     private String make,model;
3     public Car(String mk,String md) { make=mk; model=md; }
4     public void setcardetails(String mk,String md) {
5         make=mk; model=md;
6     }
7     public String getmk() { return make; }
8     public String getmd() { return model; }
9 }
10 public class Q1_CarTester {
11     public static void main(String[] args) {
12         Car mycar1 = new Car("Toyota","Yaris");
13         Car mycar2 = new Car(null,null);
14         System.out.println("Initial Details: ");
15         System.out.println("Car 1 has Details -> Make: "+mycar1.getmk()+"\tModel: "+mycar1.getmd());
16         System.out.println("Car 2 has Details -> Make: "+mycar2.getmk()+"\tModel: "+mycar2.getmd());
17
18         mycar2.setcardetails("Mercedes Benz","E Class");
19
20         System.out.println("After Details been Updated: ");
21         System.out.println("Car 1 has Details -> Make: "+mycar1.getmk()+"\tModel: "+mycar1.getmd());
22         System.out.println("Car 2 has Details -> Make: "+mycar2.getmk()+"\tModel: "+mycar2.getmd());
23     }
24 }
```

Q1_CarTester
Initial Details:
Car 1 has Details -> Make: Toyota Model: Yaris
Car 2 has Details -> Make: null Model: null
After Details been Updated:
Car 1 has Details -> Make: Toyota Model: Yaris
Car 2 has Details -> Make: Mercedes Benz Model: E Class
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Q2. Design a Java class called Rectangle with private attributes length and width. Include a constructor to initialize these attributes, as well as setter and getter methods for each attribute. Additionally, implement

methods to calculate the area and perimeter of the rectangle. Write a main method to create an object of the Rectangle class, set values for its attributes, and display the area and perimeter.

Solution along with Output:



```
1 class Rectangle {
2     private int len, wid;
3     public Rectangle(int l, int w) { len=l; wid=w; }
4     public void setval(int l, int w) { len=l; wid=w; }
5     public int getlength() { return len; }
6     public int getwidth() { return wid; }
7
8     public int area() { return len*wid; }
9     public int perimeter() { return 2*(len+wid); }
10 }
11
12 public class Q2 {
13     Run | Debug
14     public static void main(String args[]) {
15         Rectangle r=new Rectangle(10,20);
16         System.out.println("Rectangle with Length: "+r.getlength()+" & Width of: "+r.getwidth()+"\nHas Area: "+r.area()+" & Perimeter of: "+r.perimeter());
17     }
18 }
```

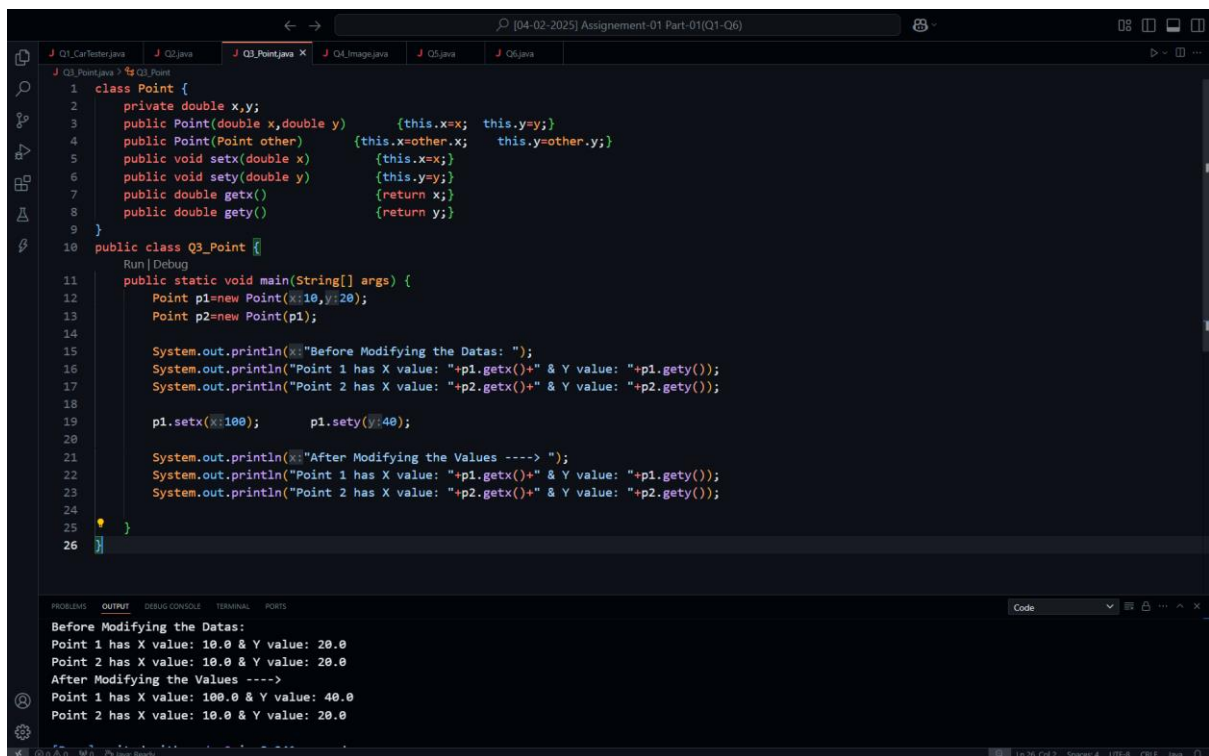
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
[Running] cd "a:\Programs\HTML & CSS (from Sems)\4th Semester\CSW-2\04-02-2025] Assignment-01 Part-01(Q1-Q6)" && javac Q2.java && java Q2
Rectangle with Length: 10 & Width of: 20
Has Area: 200 & Perimeter of: 60

[Done] exited with code=0 in 0.914 seconds
```

Q3. Write a Java program that defines a Point class with attributes X and Y, and includes a parameterized constructor to initialize these attributes. Implement a copy constructor to create a new point object with the same attribute values. Ensure that modifications made to one object do not affect the other. Utilize getter and setter methods to retrieve and update the attribute values.

Solution along with Output:

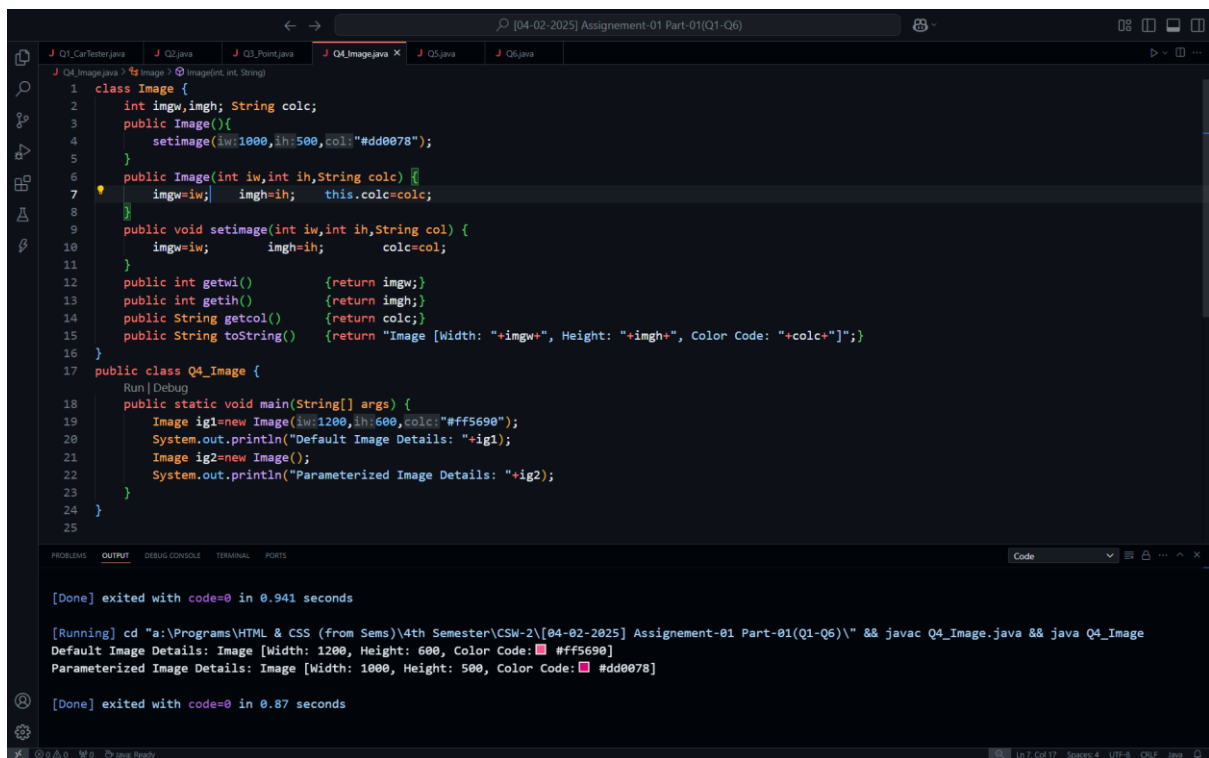


```
1 class Point {
2     private double x,y;
3     public Point(double x,double y)    {this.x=x;  this.y=y;}
4     public Point(Point other)          {this.x=other.x;  this.y=other.y;}
5     public void setx(double x)         {this.x=x;}
6     public void sety(double y)         {this.y=y;}
7     public double getx()               {return x;}
8     public double gety()               {return y;}
9 }
10 public class Q3_Point {
11     Run | Debug
12     public static void main(String[] args) {
13         Point p1=new Point(10,20);
14         Point p2=new Point(p1);
15
16         System.out.println("Before Modifying the Datas: ");
17         System.out.println("Point 1 has X value: "+p1.getx()+" & Y value: "+p1.gety());
18         System.out.println("Point 2 has X value: "+p2.getx()+" & Y value: "+p2.gety());
19
20         p1.setx(100);    p1.sety(40);
21
22         System.out.println("After Modifying the Values ----> ");
23         System.out.println("Point 1 has X value: "+p1.getx()+" & Y value: "+p1.gety());
24         System.out.println("Point 2 has X value: "+p2.getx()+" & Y value: "+p2.gety());
25     }
26 }
```

Before Modifying the Datas:
Point 1 has X value: 10.0 & Y value: 20.0
Point 2 has X value: 10.0 & Y value: 20.0
After Modifying the Values ---->
Point 1 has X value: 100.0 & Y value: 40.0
Point 2 has X value: 10.0 & Y value: 20.0

Q4. Write a program to create an Image class with attributes imageWidth, imageHeight, and colorCode. Add the required constructor, set methods, get methods, and toString method. Create the object of the image class using the default and parameterized constructor and print the details of the object.

Solution along with Output:



```
1 class Image {
2     int imgw, imgh; String colc;
3     public Image() {
4         setimage(1000, 500, "#dd0078");
5     }
6     public Image(int iw, int ih, String colc) {
7         imgw=iw; imgh=ih; this.colc=colc;
8     }
9     public void setimage(int iw, int ih, String col) {
10        imgw=iw; imgh=ih; colc=col;
11    }
12    public int getwi() {return imgw;}
13    public int getih() {return imgh;}
14    public String getcol() {return colc;}
15    public String toString() {return "Image [Width: "+imgw+", Height: "+imgh+", Color Code: "+colc+"];"}
16 }
17 public class Q4_Image {
18     public static void main(String[] args) {
19         Image ig1=new Image(1200, 600, "#ff5690");
20         System.out.println("Default Image Details: "+ig1);
21         Image ig2=new Image();
22         System.out.println("Parameterized Image Details: "+ig2);
23     }
24 }
25
```

[Done] exited with code=0 in 0.941 seconds

[Running] cd "a:\Programs\HTML & CSS (from Sems)\4th Semester\CSW-2\04-02-2025] Assignment-01 Part-01(Q1-Q6)" && javac Q4_Image.java && java Q4_Image

Default Image Details: Image [Width: 1200, Height: 600, Color Code: #ff5690]

Parameterized Image Details: Image [Width: 1000, Height: 500, Color Code: #dd0078]

[Done] exited with code=0 in 0.87 seconds

Q5. Create an ImageLibrary, which contains a set of image objects (from Q4) and operations such as searching an image, inserting an image, and getting an image. Create an ImageController class to manage the program execution and call the methods to create and manipulate images.

Solution:

```
[04-02-2025] Assignment-01 Part-01(Q1-Q6)

J_Q1_CarTester.java J_Q2.java J_Q3_Point.java J_Q4_Image.java J_Q5.java x J_Q6.java

1 import java.util.*;
2 class ImageController {
3     HashSet<Image> ImgLib = new HashSet<>();
4     public void insert(Image I) {
5         ImgLib.add(I);
6     }
7     public void Search(Image I) {
8         if (ImgLib.contains(I)) {
9             System.out.println("The Image has been found ");
10            System.out.println(I);
11        }
12        else {
13            System.out.println("Image is not found.");
14        }
15    }
16    public void getImage(Image I) {
17        System.out.println(I);
18    }
19 }
20 public class Q5 {
21     Run | Debug
22     public static void main(String[] args) {
23         Image I2 = new Image(300, 400, colc: "#fff666");
24         Image I3 = new Image(200, 300, colc: "#eee450");
25         Image I4 = new Image(150, 600, colc: "#3480fe");
26         ImageController IC = new ImageController();
27         IC.insert(I2);
28         IC.insert(I4);
29         IC.getImage(I2);
30         IC.Search(I3);
31         IC.Search(I4);
32     }
33 }
```

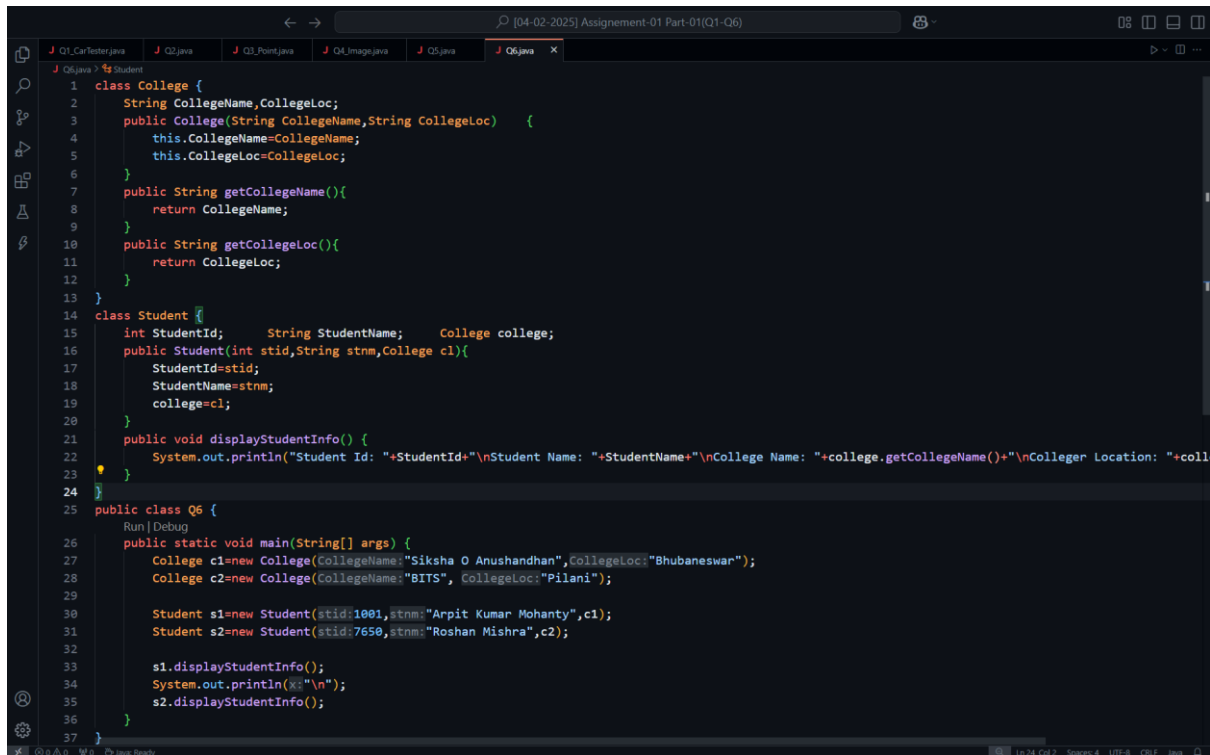
Output:

```
[Running] cd "a:\Programs\HTML & CSS (from Sems)\4th Semes
Image [Width: 300, Height: 400, Color Code: ■ #fff666]
Image is not found.
The Image has been found
Image [Width: 150, Height: 600, Color Code: ■ #3480fe]
[Done] exited with code=0 in 0.948 seconds
```

Q6. Develop a Java-based College Management System to model the relationship between colleges and students. Create a College class with attributes collegeName and collegeLoc, and a Student class with studentId, studentName, and a reference to a College object. Implement a constructor in Student to initialize these attributes and a displayStudentInfo() method to print student and college details. In the MainApp class, instantiate at least two College and Student objects

enroll each student in one of the colleges, and display all details using appropriate methods.

Solution:



```
1 class College {
2     String CollegeName,CollegeLoc;
3     public College(String CollegeName,String CollegeLoc) {
4         this.CollegeName=CollegeName;
5         this.CollegeLoc=CollegeLoc;
6     }
7     public String getCollegeName(){
8         return CollegeName;
9     }
10    public String getCollegeLoc(){
11        return CollegeLoc;
12    }
13 }
14 class Student {
15     int StudentId;    String StudentName;    College college;
16     public Student(int stid,String stnm,College c1){
17         StudentId=stid;
18         StudentName=stnm;
19         college=c1;
20     }
21     public void displayStudentInfo() {
22         System.out.println("Student Id: "+StudentId+"\nStudent Name: "+StudentName+"\nCollege Name: "+college.getCollegeName()+"\nColleger Location: "+college.getCollegeLoc());
23     }
24 }
25 public class Q6 {
26     public static void main(String[] args) {
27         College c1=new College(CollegeName:"Siksha O Anushandhan",CollegeLoc:"Bhubaneswar");
28         College c2=new College(CollegeName:"BITS", CollegeLoc:"Pilani");
29
30         Student s1=new Student(stid:1001,stnm:"Arpit Kumar Mohanty",c1);
31         Student s2=new Student(stid:7650,stnm:"Roshan Mishra",c2);
32
33         s1.displayStudentInfo();
34         System.out.println("\n");
35         s2.displayStudentInfo();
36     }
37 }
```

Output:

```
[Running] cd "a:\Programs\HTML & CSS (from Sems)\4th Semester\CSW-2\[04-06-2025]"
Student Id: 1001
Student Name: Arpit Kumar Mohanty
College Name: Siksha O Anushandhan
Colleger Location: Bhubaneswar

Student Id: 7650
Student Name: Roshan Mishra
College Name: BITS
Colleger Location: Pilani

[Done] exited with code=0 in 0.858 seconds
```

