



**INSTITUTE OF ENGINEERING AND TECHNOLOGY**  
Mohanlal Sukhadia University, Udaipur  
Name- Shivam Chouhan | Class- BTech-CSE (IV Sem) | Subject- Java Lab

**INSTITUTE OF ENGINEERING & TECHNOLOGY**  
**MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR**  
**(RAJ.)**

**DEPARTMENT OF COMPUTER SCIENCE ENGINEERING**  
**B. Tech - IV SEMESTER**



**Session 2022-23**

**Java Lab**  
**LABORATORY MANUAL**  
**BT4CS11-CP05**

**Prepared by:**  
**Shivam Chouhan**



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## JAVA Lab Practical-1

Q1. Write a Java Program to print Hello World .

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J Hello-Java.java > Hello
1 class Hello {
2     Run | Debug
3     public static void main(String[] args) {
4         System.out.println(x: "Hello and welcome!");
5     }
}
```

### Output

PROBLEMS (14) OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport-
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Hello'
Hello and welcome!
PS C:\Users\ORANGE> []
```



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## JAVA Lab Practical -2

Q2. Write a Java Program to perform Addition of two numbers.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J Add Java.java > Main
1  class Main{
2      Run | Debug
3      public static void main(String[] args) {
4          int num1=10;
5          int num2=20;
6          int sum=num1+num2;
7          System.out.println(num1+"+"+num2+"="+sum);
8      }
}
```

### Output

PROBLEMS 15 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket'
NGE\AppData\Local\Temp\vscodesws_cc742\jdt_ws\jdt.ls-java-project\bin' 'Main'
10+20=30
PS C:\Users\ORANGE>
```



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## JAVA Practical -3

Q3. Write a Java Program to find square root of number.

### Program

C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > Sqrt Java.java > ...

```
1 import java.lang.Math;
2 class SquareRoot{
3     Run | Debug
4     public static void main(String[] args) {
5         double X=5;
6         double Y;
7         Y=Math.sqrt(X);
8         System.out.println(+Y);
9     }
}
```

### Output

PROBLEMS 15 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket
NGE\AppData\Local\Temp\vscodesws_cc742\jdt_ws\jdt.ls-java-project\bin' 'SquareRoot'
2.23606797749979
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical -4

Q4. Write a Java Program to swap two numbers using third variable .

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J swaping using 3rd no.java > ...
1 import java.util.*;
2 class Swap
3 {
4     Run | Debug
5     public static void main(String a[])
6     {
7         System.out.println("Enter value of x and y:");
8         Scanner sc=new Scanner(System.in);
9
10        int x=sc.nextInt();
11        int y=sc.nextInt();
12        System.out.println("before swapping numbers:"+x+ " "+y);
13
14        x=x+y;
15        y=x-y;
16        x=x-y;
17        System.out.println("after swapping numbers:"+x+ " "+y);
18    }
}
```

### Output

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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket'
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Swap'
Enter value of x and y:
2
3
before swapping numbers:2 3
after swapping numbers:3 2
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-5

Q5. Write a Java Program to perform product of two floating number.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J multiply two float number.java > ...
1 import java.util.Scanner;
2 class Mf1{
3     Run | Debug
4     public static void main(String args[]){
5         Scanner sc=new Scanner(System.in);
6         System.out.println("Enter first floating point numnber:");
7         float flt1=sc.nextFloat();
8
9         System.out.println("Enter second floating point numnber:");
10        float flt2=sc.nextFloat();
11
12        float product=flt1*flt2;
13        System.out.println("Product of given floating point numbers::"+product);
14    }
}
```

### Output

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Mf1'
Enter first floating point numnber:
2.2
Enter second floating point numnber:
3.3
Product of given floating point numbers::7.26
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-6

Q6. Write a Java Program to find factorial of a number.

### Program

```
C:\> Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > factorial.java > ...
```

```
1 import java.util.*;
2 class Fact
3 {
4     public static void main(String args[])
5     {
6         Scanner sc=new Scanner(System.in);
7         System.out.println("Enter the number:");
8         int num=sc.nextInt();
9         int fact=1;
10        for(int i=1;i<=num;i++)
11        {
12            fact=fact*i;
13        }
14        System.out.println("Factorial of the number:"+fact);
15    }
16 }
17 }
```

### Output

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6
```

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Fact'
Enter the number:
5
Factorial of the number:120
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-7

Q7. Write a Java Program to find reverse of a number.

### Program

```
C:\> Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J Reverse Number.java > Rev_shivam
1 import java.util.Scanner;
2 class Rev_shivam
3 {
4     Run | Debug
5     public static void main(String args[])
6     {
7         int num, rem, rev=0;
8         Scanner s=new Scanner(System.in);
9
10        System.out.print(s: "Enter a Number:");
11        num=s.nextInt();
12
13        while(num!=0)
14        {
15            rem=num%10;
16            rev=(rev*10)+rem;
17            num=num/10;
18        }
19        System.out.println("\nReverse =" +rev);
20    }
}
```

### Output

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6
```

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Rev_shivam'
Enter a Number:123
```

```
Reverse =321
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-8

Q8. Write a Java Program to print star pyramid pattern by entering number of rows.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J Pyramid.java > Pyramid_shivam > main(String[])
1 import java.util.Scanner;
2 class Pyramid_shivam
3 {
4     Run | Debug
5     public static void main(String[] args)
6     {
7         int row;
8         System.out.print(s: "Enter the number of Rows (Line):");
9         Scanner s=new Scanner(System.in);
10        row=s.nextInt();
11
12        for(int i=1;i<=row;i++)
13        {
14            for(int j=i;j<row;j++)
15            {
16                System.out.print(s: " ");
17            for(int j=1;j<=i;j++)
18            {
19                System.out.print(s: "* ");
20            }
21            System.out.print(s: "\n");
22        }
23    }
24 }
```

### Output

Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket'
NGE\AppData\Local\Temp\vscodews_cc742\jdt_ws\jdt.ls-java-project\bin' 'Pyramid_shivam'
Enter the number of Rows (Line):5
*
**
* *
* * *
* * * *
* * * * *
```



## JAVA Lab Practical-9

Q9. Write a Java Program to check whether the given year is leap or not.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 3rd SEM > OOP > J Leap Year.java > ...
1 import java.util.Scanner;
2 class Leapyear_shivam
3 {
4     Run | Debug
5     public static void main(String args[])
6     {
7         Scanner sc=new Scanner(System.in);
8         int year;
9         System.out.println("Enter the year:");
10        year=sc.nextInt();
11        if(((year%4==0)&&(year%100!=0))||(year%400==0))
12        {
13            System.out.println(year+"is a leap year");
14        }
15    }
}
```

### Output

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket'
NGE\AppData\Local\Temp\vscodesws_cc742\jdt_ws\jdt.ls-java-project\bin' 'Leapyear_shivam'
Enter the year:
2004
2004is a leap year
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket'
NGE\AppData\Local\Temp\vscodesws_cc742\jdt_ws\jdt.ls-java-project\bin' 'Leapyear_shivam'
Enter the year:
2002
2002is not a leap year
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-10

Q10. Write a Java Program to find frequency of each element.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 10. Frequency of each element.java
1 import java.util.Arrays;
2 class Shivam_p10
3 {
4     Run | Debug
5     public static void main(String args[])
6     {
7         int[] arr=new int[]{0,2,1,4,5,1,3,1,3,4,2,1,4,5,2,3,5,1,2,1,6};
8         Arrays.sort(arr);
9         System.out.println("The frequency of each element of array is as follows:");
10        for(int i=0;i<arr.length;i++)
11        {
12            int cnt=1;
13            while(i+1<arr.length && arr[i]==arr[i+1])
14            {
15                cnt++;
16                i++;
17            }
18            System.out.println("Occurrence of "+arr[i]+" is "+cnt+" times");
19        }
20    }
}
```

### Output

PROBLEMS 1 OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\es' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_4
The frequency of each element of array is as follows:
Occurrence of 0 is 1 times
Occurrence of 1 is 6 times
Occurrence of 2 is 4 times
Occurrence of 3 is 3 times
Occurrence of 4 is 3 times
Occurrence of 5 is 3 times
Occurrence of 6 is 1 times
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-11

Q11. Write a Java Program to print array in reverse order.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 11. Elements of array in reverse order.java
1 import java.util.Arrays;
2 class Shivam_p11
3 {
4     Run | Debug
5     public static void main(String args[])
6     {
7         int[] arr= new int[] {2,1,4,5,6};
8         int n= arr.length;
9         for(int i=0; i<n/2;i++)
10        {
11            int temp=arr[i];
12            arr[i]=arr[n-i-1];
13            arr[n-i-1]=temp;
14        }
15        System.out.println("The reverse of array is:");
16        for(int i=0; i<n;i++)
17        {
18            System.out.print(arr[i]+" ");
19        }
20    }
21 }
```

### Output

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vsc
The reverse of array is:
6 5 4 1 2
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-12

Q12. Write a Java Program to print Fibonacci Series.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 12. Fibonacci Series.java > ...
1 import java.util.Scanner;
2 class Shivam_fibonacci
3 {
4     Run | Debug
5     public static void main(String[] args)
6     {
7         int n, a = 0, b = 0, c = 1;
8         Scanner s = new Scanner(System.in);
9         System.out.print(s:"Enter value of n:");
10        n = s.nextInt();
11        System.out.print(s:"Fibonacci Series:");
12        for(int i = 1; i <= n; i++)
13        {
14            a = b;
15            b = c;
16            c = a + b;
17            System.out.print(a+" ");
18        }
19    }
}
```

### Output

PROBLEMS (4) OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket,server=true,-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_49756\jdt_ws\jdt.ls-java-project\bin' 'Shivam_fibonacci'
Enter value of n:5
Fibonacci Series:0 1 1 2 3
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-13

Q13. Write a Java Program to print reverse star pyramid pattern.

### Program

```
C:\> Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 13. Reverse Pyramid.java > ...
1 import java.util.Scanner;
2 class Shivam_rpyramid
3 {
4     Run | Debug
5     public static void main(String[] args)
6     {
7         int numberOfRows;
8         System.out.println("Enter Number of rows: ");
9
10        Scanner sc = new Scanner(System.in);
11        numberOfRows = sc.nextInt();
12        sc.close();
13
14        for (int i= 0; i<= numberOfRows-1; i++)
15        {
16
17            for (int j=0; j<=i; j++)
18            {
19                System.out.print(" ");
20            }
21
22            for (int k=0; k<=numberOfRows-1-i; k++)
23            {
24                System.out.print("* " );
25            }
26
27            System.out.println();
28        }
29    }
30 }
```

### Output

PROBLEMS 5 OUTPUT TERMINAL DEBUG CONSOLE

Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket,server=-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_49756\jdt_ws\jdt.ls-java-project\bin' 'Shivam_rpyramid'
Enter Number of rows:
5
*****
****
 ***
 **
 *
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-14

Q.14 Write a Java Program to print elements present at the odd position of the array.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 14. odd position.java > Shivam_p14
1 class Shivam_p14
2
3     Run | Debug
4     public static void main(String[] args)
5     {
6         int[] arr=new int[] {4,1,6,12,98,43,16,76,23,77,53,60};
7         int n=arr.length;
8         System.out.println("The elements at odd position of array are:");
9         for(int i=0; i<n; i=i+2)
10        {
11            System.out.print(arr[i]+" ");
12        }
13    }
14 }
```

### Output

```
PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell
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PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7a05c\jdt_ws\
The elements at odd position of array are:
4 6 98 16 23 53
```



## JAVA Lab Practical-15

Q.15 Write a Java Program to print the smallest element in the array.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 15. Smallest Element of array.java > Shivam_p15
1  class Shivam_p15 {
2      Run | Debug
3      public static void main(String[] args)
4      {
5          int [] arr = new int [] {25, 11, 7, 75, 56};
6          int min=arr[0];
7          for (int i = 0; i < arr.length; i++)
8          {
9              if(arr[i] <min) min = arr[i];
10         }
11     System.out.println("Smallest element present in given array:" +min);
12 }
13 }
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
RANGE\AppData\Local\Temp\vscodews_7a05c\jdt_ws\jdt.ls-java-project
Smallest element present in given array:7
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-16

Q.16 Write a Java Program to print jagged array.

### Program

```
C:\> Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 16. Jagged Array.java
1 class Shivam_p16
2 {
3     Run | Debug
4     public static void main(String[] args)
5     {
6         int arr[][] = new int[2][];
7         arr[0] = new int[3];
8         arr[1] = new int[2]; int count = 0;
9         for (int i = 0; i < arr.length; i++)
10        {
11            for (int j = 0; j < arr[1].length; j++)
12            {
13                arr[i][j] = count++;
14            }
15        }
16        System.out.println("Contents of 20 Jagged Array");
17
18        for (int i = 0; i < arr.length; i++)
19        {
20            for (int j=0; j< arr[i].length; j++)
21            {
22                System.out.print(arr[i][j]+ " ");
23            }
24            System.out.println();
25        }
26    }
}
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7a05c\jdt_ws\jdt
Contents of 20 Jagged Array
0 1 0
2 3
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-17

Q.17 Write a Java Program to find product of two matrices.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > 17. Product of two matrices.java
1  class Shivam_17
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          int row1, col1, row2, col2;
7          int a[][] = {{1, 3, 2}, {3, 1, 1}, {1, 2, 2}};
8          int b[][] = {{2,7,8}, {9,4,1}, {7,1,0}};
9          row1 = a.length; col1 = a[0].length;
10         row2 = b.length; col2 = b[0].length;
11         if(col1 != row2)
12         {
13             System.out.println("Matrices cannot be multiplied");
14         }
15         else{
16             int prod[][]=new int[row1][col2];
17             for (int i = 0; i < row1; i++){
18                 for (int j=0; j < col2; j++){
19                     for (int k = 0; k < row2; k++)
20                     {
21                         prod[i][j]=prod[i][j]+a[i][k]*b[k][j];
22                     }
23                 }
24             System.out.println("Product of two matrices: ");
25             for(int i=0; i < row1; i++){
26                 for (int j=0; j < col2; j++){
27                     System.out.print(prod[i][j] + " ");
28                 }
29             System.out.println();
30         }
31     }
32 }
33 }
```



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## Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7a05c\jdt_ws\jdt
Product of two matrices:
0 0 0
0 209 0
0 0 0
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-18

Q.18 Write a Java Program to find transpose of given matrix.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 18. Transpose of matrix.java > p18
1  class p18
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          int original[][]={{1,3,4},{2,4,3},{3,4,5}};
7          int transpose[][]=new int[3][3];
8          for(int i=0;i<3;i++)
9          {
10             for(int j=0;j<3;j++)
11             {
12                 transpose[i][j]=original[j][i];
13             }
14         }
15         System.out.println("Printing Matrix without Transpose:");
16         for(int i=0; i<3; i++)
17         {
18             for(int j=0; j<3; j++)
19             {
20                 System.out.print(original[i][j]+ " ");
21             }
22             System.out.println();
23         }
24         System.out.println("Printing Matrix after Transpose:");
25         for(int i=0; i<3; i++)
26         {
27             for(int j=0; j<3; j++)
28             {
29                 System.out.print(transpose[i][j]+ " ");
30             }
31             System.out.println();
32         }
33     }
34 }
```



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---

## Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_61654\jdt_ws\jdt
Printing Matrix without Transpose:
1 3 4
2 4 3
3 4 5
Printing Matrix after Transpose:
1 2 3
3 4 4
4 3 5
PS C:\Users\ORANGE> []
```



## JAVA Lab Practical-19

Q.19 Write a Java Program to find whether a given matrix is identity matrix or not.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 19. Identity Matrix.java > p19
1  class p19
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          int rows, cols;
7          boolean flag=true;
8          int a[][]={{1,0,0},{0,1,0},{0,0,1}};
9          rows=a.length;
10         cols=a[0].length;
11         if(rows != cols)
12             System.out.println(x:"Matrix should be a square Matrix");
13         else
14         {
15             for(int i=0; i<rows; i++)
16             {
17                 for(int j=0; j<cols; j++)
18                 {
19                     if(i==j && a[i][j]!=1)
20                     {
21                         flag=false;
22                         break;
23                     }
24                     if(i!=j && a[i][j]!=0)
25                     {
26                         flag=false;
27                         break;
28                     }
29                 }
30                 if(flag)
31                     System.out.println(x:"Given matrix is an identity matrix");
32                 else
33                     System.out.println(x:"Given matrix is not an identity matrix");
34             }
35         }
36     }
```



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## Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell

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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_61654\jdt_ws\
Given matrix is an identity matrix
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-20

Q.20 Write a Java Program to find sum of each row and column in the given matrix.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > 20. sum of each row and column.java > p20
1  class p20
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          int rows, cols, sumRow, sumCol;
7          int a[][]={{1,4,2},{3,2,9},{8,7,0}};
8          rows=a.length;
9          cols=a[0].length;
10         for(int i=0; i<rows; i++)
11         {
12             sumRow=0;
13             for(int j=0; j<cols; j++)
14             {
15                 sumRow=sumRow + a[i][j];
16             }
17             System.out.println("Sum of " +(i+1) +" row: "+ sumRow);
18         }
19         for(int i=0; i<cols; i++)
20         {
21             sumCol=0;
22             for(int j=0; j<rows; j++)
23             {
24                 sumCol = sumCol + a[j][i];
25             }
26             System.out.println("Sum of " + (i+1) +" column: " + sumCol);
27         }
28     }
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_61654\jdt_ws\jdt
Sum of 1 row: 7
Sum of 2 row: 14
Sum of 3 row: 15
Sum of 1 column: 12
Sum of 2 column: 13
Sum of 3 column: 11
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-21

Q.21 Write a Java Program having class Dog with data members name, breed, age, color. Print the above characteristics of any three dogs.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 21. Dog.java > Dog
1  class Dog
2
3      private String name;
4      private String breed;
5      private int age;
6      private String color;
7      public Dog(String name, String breed, int age, String color)
8      {
9          this.name= name;
10         this.breed= breed;
11         this.age= age;
12         this. color= color;
13     }
14     public String getName(){return name;}
15     public String getBreed(){return breed;}
16     public int getAge(){return age;}
17     public String getColor(){return color;}
18     Run | Debug
19     public static void main(String[] args)
20     {
21         Dog dog1= new Dog(name:"Buddy",breed:"Golden Retriever",age:5,color:"Golden");
22         Dog dog2= new Dog(name:"Max",breed:"Labrador Retriever",age:3,color:"Black");
23         Dog dog3= new Dog(name:"Charlie",breed:"Poodle",age:2,color:"White");
24         System.out.println("Dog 1: " + dog1.getName() + ", " + dog1.getBreed() + ", " + dog1.getAge() + ", " + dog1.getColor());
25         System.out.println("Dog 2: " + dog2.getName() + ", " + dog2.getBreed() + ", " + dog2.getAge() + ", " + dog2.getColor());
26         System.out.println("Dog 3: " + dog3.getName() + ", " + dog3.getBreed() + ", " + dog3.getAge() + ", " + dog3.getColor());
27     }
28 }
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodesws_61654\jdt_ws\jdt
Dog 1: Buddy, Golden Retriever, 5, Golden
Dog 2: Max, Labrador Retriever, 3, Black
Dog 3: Charlie, Poodle, 2, White
PS C:\Users\ORANGE>
```



## JAVA Lab Practical-22

Q.22 Write a Java Program to show the concept of default constructor .

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 22. Construct.java > PCE
1  class p22
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          DCE object1 =new DCE();
7          object1.doAddition();
8          PCE object2=new PCE(num1:100,num2:200);
9          object2.doAddition();
10     }
11 }
12 class DCE
13 {
14     int num1=5, num2=10, result;
15     int doAddition()
16     {
17         result=num1+num2;
18         System.out.println("This method is called using a default constructor");
19         return result;
20     }
21 }
22 class PCE
23 {
24     int num1, num2, result;
25     public PCE(int num1, int num2)
26     {
27         this.num1=num1;
28         this.num2=num2;
29     }
30     int doAddition()
31     {
32         result = num1 + num2;
33         System.out.println("This method is called using a parametrized construct");
34         return result;
35     }
36 }
```



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## Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell

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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' 'RANGE\AppData\Local\Temp\vscodews_7683a\jdt_ws\jdt.ls-java-project\  
This method is called using a default constructor  
This method is called using a parametrized construct  
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-23

Q.23 Write a Java Program for Constructor Overloading/ Constructor chaining.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 23. Constructor Overloading.java > ...
1  class Teacher
2  {
3      int id;
4      String name;
5      Teacher()
6      {
7          System.out.println("This is a default constructor");
8      }
9
10     Teacher(int i, String n)
11     {
12         id = i;
13         name = n;
14     }
15     Run | Debug
16     public static void main(String[] args)
17     {
18         Teacher t = new Teacher();
19         System.out.println("Default Constructor values:");
20         System.out.println("Student ID: "+t.id + "\nStudent Name: "+t.name);
21         System.out.println("Parametrized Constructor values:");
22         Teacher teacher = new Teacher(i:10, n:"David");
23         System.out.println("Student Id: "+teacher.id+ "\nStudent Name: "+teacher.name);
24     }
}
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7683a\jdt_ws\jdt
This is a default constructor
Default Constructor values:
Student ID: 0
Student Name: null
Parametrized Constructor values:
Student Id: 10
Student Name: David
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-24

Q.24 Write a Java Program for implementation of Copy Constructor.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 24. Copy Constructor.java > ...
1  class Fruit
2  {
3      private double fprice;
4      private String fname;
5      Fruit(double fPrice, String fName)
6      {
7          fprice=fPrice;
8          fname=fName;
9      }
10     Fruit(Fruit fruit)
11     {
12         System.out.println(x:"\nAfter invoking the Copy Constructor:\n");
13         fprice=fruit.fprice;
14         fname=fruit.fname;
15     }
16     double showPrice() {return fprice;}
17     String showName() {return fname;}
18     Run | Debug
19     public static void main(String[] args)
20     {
21         Fruit f1 = new Fruit(fPrice:399, fName:"Ruby Roman Grapes");
22         System.out.println("Name of the first fruit: "+ f1.showName());
23         System.out.println("Price of the first fruit: "+ f1.showPrice());
24         Fruit f2= new Fruit(f1);
25         System.out.println("Name of the second fruit: "+ f1.showName());
26         System.out.println("Price of the second fruit: "+ f2.showPrice());
27     }
}
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7683a\jdt_ws\jdt
Name of the first fruit: Ruby Roman Grapes
Price of the first fruit: 399.0
```

After invoking the Copy Constructor:

```
Name of the second fruit: Ruby Roman Grapes
Price of the second fruit: 399.0
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-25

Q.25 Write a Java Program to show use of “extends” keyword.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 25. extend keyword.java
1  class A
2  {
3  |     int a=9;
4  }
5  class B extends A
6  {
7  |     int b=4;
8  }
9  class Demo
10 {
11
12     Run | Debug
13     public static void main(String[] args)
14     {
15         B obj = new B();
16         System.out.println("Value of a is: "+ obj.a);
17         System.out.println("Value of b is: "+ obj.b);
18     }
19 }
```

### Output

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '
'-cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_7683a\jdt_ws\jdt
Value of a is: 9
Value of b is: 4
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-26

Q.26 Write a Java Program to show scope of private modifier.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 26. A.java > ...
1  class Shivam_A
2  {
3      private int data=40;
4      private void msg(){System.out.println("Hello java");}
5  }
6  class Demo
7  {
8      public static void main(String args[])
9      {
10         Shivam_A obj = new Shivam_A();
11         System.out.println(obj.data);
12         obj.msg;
13     }
14 }
```

### Output

PROBLEMS 4    OUTPUT    TERMINAL    DEBUG CONSOLE

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport
'C:\Users\ORANGE\AppData\Local\Temp\vscodesws_9b399\jdt_ws\jdt.ls-java-project\bin' 'Demo'
Exception in thread "main" java.lang.Error: Unresolved compilation problems:
The field Shivam_A.data is not visible
Syntax error, insert "VariableDeclarators" to complete LocalVariableDeclaration
msg cannot be resolved or is not a field

at Demo.main(26. A.java:11)
```



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## JAVA Lab Practical-27

Q.27 Write a Java Program scope of public modifier.

### Program 1:

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 27.B.java > ...
1  class Shivam_B
2  {
3      public int data=40;
4      public void msg(){System.out.println("Hello java");}
5  }
6  class Demo
7  {
8      Run | Debug
9      public static void main(String args[])
10     {
11         Shivam_B obj = new Shivam_B();
12         System.out.println(obj.data);
13         obj.msg();
14     }
15 }
```

### Output 1:

PROBLEMS 1 OUTPUT TERMINAL DEBUG CONSOLE

```
Windows PowerShell
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```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6
```

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
'C:\Users\ORANGE\AppData\Local\Temp\vscodews_2aa35\jdt_ws\jdt.ls
40
Hello java
PS C:\Users\ORANGE>
```



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---

## Program 2:

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 30. public.java >
1  class Shivam_Animal
2  {
3      public int legCount;
4      public void display()
5      {
6          System.out.println("I am an animal.");
7          System.out.println("I have " + legCount + " legs.");
8      }
9  }
10 class Main
11 {
12     Run | Debug
13     public static void main( String args[] )
14     {
15         Shivam_Animal animal = new Shivam_Animal();
16         animal.legCount = 4;
17         animal.display();
18     }
}
```

## Output 2:

PROBLEMS 4 OUTPUT TERMINAL DEBUG CONSOLE

Windows PowerShell  
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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
'C:\Users\ORANGE\AppData\Local\Temp\vscodews_2aa35\jdt_ws\jdt.ls
I am an animal.
I have 4 legs.
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-28

Q.28 Write a Java Program to show scope of protected modifier.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 28. Animal.java
1  class Animal
2  {
3      protected void display()
4      {
5          System.out.println("I am Animal");
6      }
7  }
8  class Shivam_Cat extends Animal
9  {
10     Run | Debug
11     public static void main(String args[])
12     {
13         Shivam_Cat cat = new Shivam_Cat();
14         cat.display();
15     }
}
```

### Output

PROBLEMS 2 OUTPUT TERMINAL DEBUG CONSOLE

```
Windows PowerShell
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```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6
```

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
'C:\Users\ORANGE\AppData\Local\Temp\vscodews_2aa35\jdt_ws\jdt.ls'
I am Animal
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical-29

Q.29 Write a Java Program to show scope of default modifier.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 29. Program.java
1 import pack.*;
2 public class Shivam_Program
3 {
4     Run | Debug
5     public static void main(String[] args)
6     {
7         check obj = new check();
8         obj.display();
9     }
}
```

### Output

PROBLEMS 3 OUTPUT TERMINAL DEBUG CONSOLE

Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp='
'C:\Users\ORANGE\AppData\Local\Temp\vscodews_2aa35\jdt_ws\jdt.ls-java-project\bin
Exception in thread "main" java.lang.Error: Unresolved compilation problems:
    check cannot be resolved to a type
    check cannot be resolved to a type

        at Shivam_Program.main(29. Program.java:6)
PS C:\Users\ORANGE>
```



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## JAVA Lab Practical- 30

Q.30 Write a Java program to implement Java Try Catch block

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 31.Try.java > ...
1  class Shivam_p31
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          try
7          {
8              int divideByZero = 5 / 0;
9              System.out.println("Rest of code in try block");
10         }
11         catch (ArithmaticException e)
12         {
13             System.out.println("Arithmatic Exception => " + e.getMessage());
14         }
15     }
```

### Output

PROBLEMS (5) OUTPUT TERMINAL DEBUG CONSOLE

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```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=\AppData\Local\Temp\vscodews_1cca3\jdt_ws\jdt.ls-java-project\bin' 'Shivam_p31'
Arithmatic Exception => / by zero
```



## JAVA Lab Practical- 31

Q.31 Write a Java program to implement Java Try finally block.

### Program

C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 32. Finally block.java > ...

```
1  class Shivam_p32
2  {
3      Run | Debug
4      public static void main(String[] args)
5      {
6          try
7          {
8              int divideByZero = 5 / 0;
9          }
10         finally
11         {
12             System.out.println("Finally block is always executed");
13         }
14     }
}
```

### Output

PROBLEMS 5 OUTPUT TERMINAL DEBUG CONSOLE

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe' '-agentlib:jdwp=transport=dt_socket
'C:\Users\ORANGE\AppData\Local\Temp\vscodews_1cca3\jdt_ws\jdt.ls-java-project\bin' 'Shivam_p32'
Finally block is always executed
Exception in thread "main" java.lang.ArithmetricException: / by zero
at Shivam_p32.main(32. Finally block.java:7)
```



## JAVA Lab Practical- 32

Q.32 Write a Java program to implement Java Try Catch finally block.

### Program

```
C:\> Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 33. Try catch finally.java > ...
1 import java.io.*;
2 class ListOfNumbers
3 {
4     private int[] list = {5, 6, 8, 9, 2};
5     public void writeList()
6     {
7         PrintWriter out = null;
8         try
9         {
10            System.out.println("Entering try statement");
11            out = new PrintWriter(new FileWriter(fileName:"OutputFile.txt"));
12            for (int i = 0; i < 7; i++)
13            {
14                out.println("Value at: " + i + " = " + list[i]);
15            }
16        }
17        catch (Exception e)
18        {
19            System.out.println("Exception => " + e.getMessage());
20        }
21        finally
22        {
23            if (out != null)
24            {
25                System.out.println("Closing PrintWriter");
26                out.close();
27            }
28            else
29            {
29                System.out.println("Print Writer not open");
30            }
31        }
32    }
33 }
34 class Shivam_p33
35 {
36     Run | Debug
37     public static void main(String[] args)
38     {
39         ListOfNumbers list = new ListOfNumbers();
40         list.writeList();
41     }
42 }
```



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Mohanlal Sukhadia University, Udaipur

Name- Shivam Chouhan | Class- BTech-CSE (IV Sem) | Subject- Java Lab

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## Output

PROBLEMS 5 OUTPUT TERMINAL DEBUG CONSOLE

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Try the new cross-platform PowerShell <https://aka.ms/pscore6>

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
'C:\Users\ORANGE\AppData\Local\Temp\vscodesws_1cca3\jdt_ws\jdt.ls
Entering try statement
Exception => Index 5 out of bounds for length 5
Closing PrintWriter
```



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Name- Shivam Chouhan | Class- BTech-CSE (IV Sem) | Subject- Java Lab

## JAVA Lab Practical- 33

Q.33 Write a Java program to create a new file.

### Program

```
C: > Users > ORANGE > Desktop > SHIVAM > 4th Sem > Java > J 34.Create File.java > ...
1 import java.io.File;
2 class CreateFile_Shivam
3 {
4     Run | Debug
5     public static void main(String args[])
6     {
7         final String fileName = "file1.txt";
8         try
9         {
10             File objFile = new File(fileName);
11             if (objFile.createNewFile())
12             {
13                 System.out.println("File created successfully.");
14             }
15             else
16             {
17                 System.out.println("File creation failed!!!");
18             }
19         } catch (Exception Ex)
20         {
21             System.out.println("Exception : " + Ex.toString());
22         }
23     }
24 }
```

### Output

PROBLEMS 1 OUTPUT TERMINAL PORTS DEBUG CONSOLE

```
Windows PowerShell
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```

```
Try the new cross-platform PowerShell https://aka.ms/pscore6
```

```
PS C:\Users\ORANGE> & 'C:\Program Files\Java\jdk-20\bin\java.exe'
cp' 'C:\Users\ORANGE\AppData\Local\Temp\vscodews_c9d42\jdt_ws\jdt.
File created successfully.
```