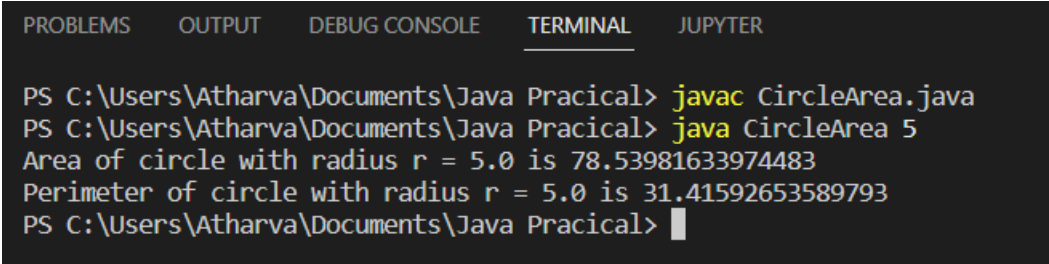# CATEGORY A JAVA BASICS

A1-WAP program to find Area and Perimeter of Circle. Accept radius as command line argument.

Code:

```
public class CircleArea
{
        public static void main (String[] args)
        {
                double r, a,p ;
                r = Double.parseDouble(args[0]);
                a = Math.PI*r*r;
                p = 2*Math.PI*r;
                System.out.println("Area of circle with radius r = "+r+" is "+a);
        System.out.println("Perimeter of circle with radius r = "+r+" is "+p);
        }
}
```

Output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    JUPYTER

PS C:\Users\Atharva\Documents\Java Pracical> javac CircleArea.java
PS C:\Users\Atharva\Documents\Java Pracical> java CircleArea 5
Area of circle with radius r = 5.0 is 78.53981633974483
Perimeter of circle with radius r = 5.0 is 31.41592653589793
PS C:\Users\Atharva\Documents\Java Pracical>
```

A2-Sales tax in some City is 8.25%. Write a program that accepts a price on the command line and prints out the appropriate tax and total purchase price.

Code:

```java
public class TaxCalculation {

    public static void main(String[] args)
    {
            double Price, Tax, Total;

            Price = Double.parseDouble(args[0]);

            Tax = Price*(8.25/100);

            Total = Price+Tax;

            System.out.println("Tax= "+Tax+"\n Total price= "+Total);

    }


}
```
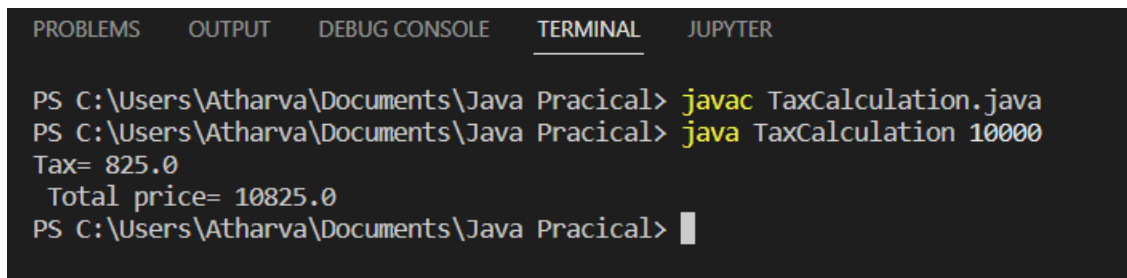
Output:

```
PROBLEMS      OUTPUT      DEBUG CONSOLE      TERMINAL      JUPYTER

PS C:\Users\Atharva\Documents\Java Pracical> javac TaxCalculation.java
PS C:\Users\Atharva\Documents\Java Pracical> java TaxCalculation 10000
Tax= 825.0
 Total price= 10825.0
PS C:\Users\Atharva\Documents\Java Pracical>
```

A3- There are exactly 2.54 centimeters to an inch. Write a program that takes a number of inches from the command line and converts it to centimeters.

Code:

```java
public class InchToCM {

    public static void main(String[] args)
    {
            float inch,cm;
```

```
            inch = Float.parseFloat(args[0]);

            cm = inch*2.54F;

            System.out.println(inch+" Inch= "+cm+" centimeters");

        }

}
```
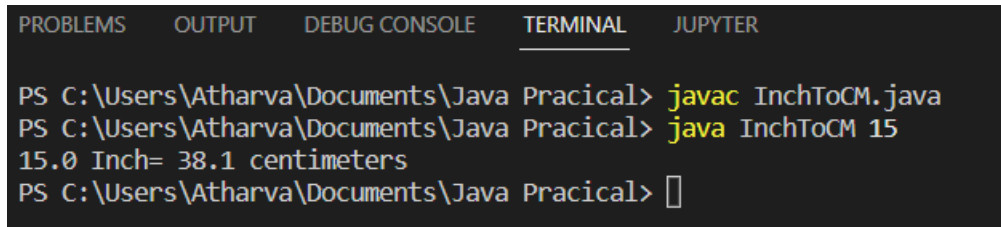
Output:

A4- Write a program to find solution of quadratic equation. Accept a, b and c from user.

Code:

```java
import java.util.Scanner;
public class QuadraticEq {
        public static void main(String[] args)
        {
                double a, b, c, root1, root2;
                System.out.println("For given equation ax^2+bx+c");
                System.out.print("Enter a: ");
                Scanner sc=new Scanner(System.in);
                a = sc.nextDouble();
                System.out.print("\nEnter b: ");
                b = sc.nextDouble();
                System.out.print("\nEnter c: ");
                c = sc.nextDouble();
                double d=(b*b)-(4*a*c);
                System.out.println("Discriminant= "+d);
                 sc.close();
```

```java
        if(d>0)
        {
                System.out.println("Roots are real and they are unequal");
                root1 = (-b+Math.sqrt(d))/(2*a);
                root2 = (-b-Math.sqrt(d))/(2*a);
                System.out.println("Root1= "+root1);
                System.out.println("Root2= "+root2);
        }
        else if(d==0)
        {
                System.out.println("Roots are real and they are equal");
                root1 = (-b+Math.sqrt(d))/(2*a);
                System.out.println("Root1= "+root1);
        }
        else
        {
                System.out.println("Roots are IMAGINARY");
        }
    }
}
```

Output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    JUPYTER

PS C:\Users\Atharva\Documents\Java Pracical> javac QuadraticEq.java
PS C:\Users\Atharva\Documents\Java Pracical> java QuadraticEq
For given equation ax^2+bx+c
Enter a: 1

Enter b: 5

Enter c: 2
Discriminant= 17.0
Roots are real and they are unequal
Root1= -0.4384471871911697
Root2= -4.561552812808831
PS C:\Users\Atharva\Documents\Java Pracical> []
```

A5- Write a program to Calculate the Sum of Digits of Given any Number.

Code:

import java.util.Scanner;

public class SumOfDigits {

        public static void main(String[] args)

        {

                Scanner sc = new Scanner(System.in);

                int n, no, r, sum=0;

                System.out.println("Enter a number: ");

                no = sc.nextInt();

                sc.close();

                n = no;

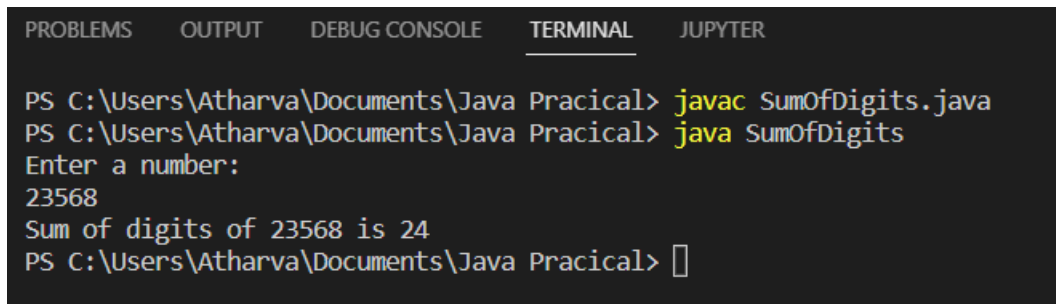   while(n>0)

                {

                        r = n%10;

                        sum = sum+r;

                        n = n/10;
```

```
            }
            System.out.println("Sum of digits of "+no+" is "+sum);

        }
}
```

Output:


```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    JUPYTER

PS C:\Users\Atharva\Documents\Java Pracical> javac SumOfDigits.java
PS C:\Users\Atharva\Documents\Java Pracical> java SumOfDigits
Enter a number:
23568
Sum of digits of 23568 is 24
PS C:\Users\Atharva\Documents\Java Pracical> []
```

A6- Write a program Check upper case or lower case of character.

Code:

```
import java.util.Scanner;
public class CheckCharCase {


        public static void main(String[] args)
        {
                Scanner sc = new Scanner (System.in);
                System.out.println("Enter Character: ");


                String c = sc.next();
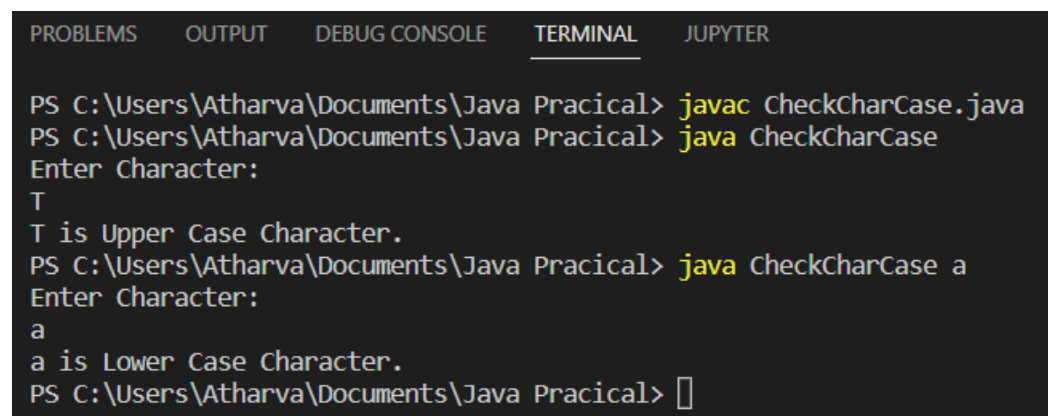                char ch = c.charAt(0);
                sc.close();
```

```java
        if(ch>=65 && ch<=90)

        {

        System.out.println(ch+" is Upper Case Character.");

        }

        else if(ch>=97 && ch<=122)

        {

        System.out.println(ch+" is Lower Case Character.");

        }

        else

        {

        System.out.println("Enter Character");

        }

    }

}
```

Output:

```
PROBLEMS     OUTPUT     DEBUG CONSOLE     TERMINAL     JUPYTER

PS C:\Users\Atharva\Documents\Java Pracical> javac CheckCharCase.java
PS C:\Users\Atharva\Documents\Java Pracical> java CheckCharCase
Enter Character:
T
T is Upper Case Character.
PS C:\Users\Atharva\Documents\Java Pracical> java CheckCharCase a
Enter Character:
a
a is Lower Case Character.
PS C:\Users\Atharva\Documents\Java Pracical> []
```

A7- Write a program to find whether entered character is a vowel consonant number or a special character.

Code:

```java
import java.util.Scanner;

public class CheckVowelSpecial {


        public static void main(String[] args)

        {

                Scanner sc = new Scanner(System.in);

                System.out.println("Enter Character: ");


                String c = sc.next().toLowerCase();

                char ch = c.charAt(0);

    sc.close();

                if(ch>='a' && ch<='z')

                {

                        if(ch=='a'||ch=='e'||ch=='i'||ch=='o'||ch=='u')

                        {

                                System.out.println(ch+" is a vowel");

                        }

                        else

                        {

                                System.out.println(ch+" is a consonant");
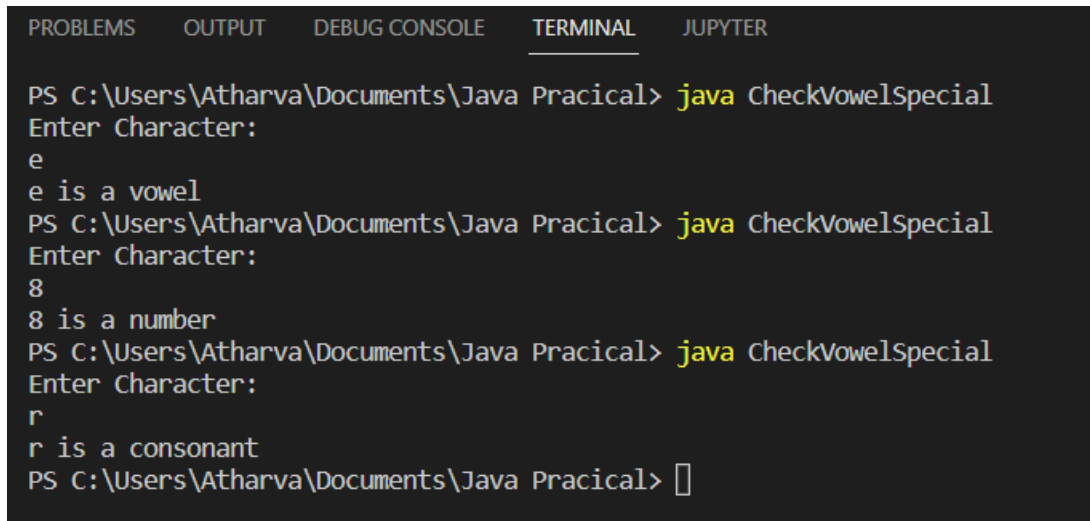
                        }

                }

                else if(ch>='0' && ch<='9')

                {

                System.out.println(ch+" is a number");

                }

                else

                {
```

```java
                    System.out.println(ch+" is a special character");

                    }

          }

}
```

Output:

A8- Write a Java program to find the maximum and minimum value of an array.

Code:

```java
import java.util.Scanner;

public class ArrayStat {

          public static void main(String[] args)

          {

                    int n, temp;

                    Scanner sc = new Scanner(System.in);

                    System.out.print("Enter no. of elements in array: ");

                    n = sc.nextInt();

                    int[] a = new int[n];
```

```java
System.out.println("Enter "+n+" elements of array a: ");

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

{

        a[i] = sc.nextInt();

}

System.out.println("Array elements are: ");

sc.close();

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

{

        System.out.print(a[i] +"\t");

}

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

{

        for(int j=i+1 ; j<n ; j++)

        {

                if(a[i]>a[j])

                {

                        temp=a[i];

                        a[i]=a[j];

                        a[j]=temp;

                }

        }

}

System.out.println("\n Min value is: "+a[0]+"\n Max value is: "+a[n-1]);

        }

}
```

Output:

A9- Write a Java program to find addition of two matrices. Accept matrix from user.

Code:

```
import java.util.Scanner;

public class AddMatrices {


    public static void main(String[] args)

    {

            int row, col;

            Scanner sc = new Scanner(System.in);

            System.out.print("Input number of rows: ");

            row = sc.nextInt();

            System.out.print("Input number of cols: ");

            col = sc.nextInt();


            int[][] a = new int[row][col];  //for matrix 1

            int[][] b = new int[row][col];  //for matrix 2

            int[][] c = new int[row][col];  //for matrix 3

            System.out.println("Enter "+(row*col)+" elements of matrix a: ");

            for (int i=0; i<row; i++)

            {

                    for (int j=0; j<col; j++)
```

```java
            {
                    a[i][j] = sc.nextInt();
            }
    }
    System.out.println("Enter "+(row*col)+" elements of matrix b: ");
    for (int i=0; i<row; i++)
    {
            for (int j=0; j<col; j++)
            {
                    b[i][j] = sc.nextInt();
            }
    }
    System.out.println("Matrix a: ");
    for (int i=0; i<row; i++)
    {
            for (int j=0; j<col; j++)
            {
                    System.out.print(a[i][j] + "\t");
            }
            System.out.print("\n");
    }
    System.out.println("Matrix b: ");
    for (int i=0; i<row; i++)
    {
            for (int j=0; j<col; j++)
            {
                    System.out.print(b[i][j] + "\t");
            }
            System.out.print("\n");
```

```java
                }

                for (int i=0; i<row; i++)

                {

                        for (int j=0; j<col; j++)

                        {

                                c[i][j] = a[i][j]+b[i][j];

                        }

                }

                System.out.println(":: Final Matrix: ");

                sc.close();

                for (int i=0; i<row; i++)

                {

                        for (int j=0; j<col; j++)

                        {

                                System.out.print(c[i][j] + "\t");

                        }

                        System.out.print("\n");

                }

        }

}
```

Output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    JUPYTER: VARIABLES

PS C:\Users\Atharva\Documents\Java Pracical> javac AddMatrices.java
PS C:\Users\Atharva\Documents\Java Pracical> java AddMatrices
Input number of rows: 3
Input number of cols: 3
Enter 9 elements of matrix a:
3       6       8
91      5       5
8       3       1
Matrix b:
3       6       7
8       3       29
1       4       8
:: Final Matrix:
6       12      15
99      8       34
9       7       9
PS C:\Users\Atharva\Documents\Java Pracical> []
```

A10- Write a Java program to find multiplication of two matrices. Accept matrix from user.

Code:

import java.util.Scanner;

public class MultiplyMatrices {

    public static void main(String[] args)

    {

        int row, col;

        Scanner sc = new Scanner(System.in);

        System.out.print("Input number of rows: ");

        row = sc.nextInt();

        System.out.print("Input number of cols: ");

        col = sc.nextInt();

        int[][] a = new int[row][col]; //for matrix 1

        int[][] b = new int[row][col]; //for matrix 2

        int[][] c = new int[row][col]; //for matrix 3

```java
System.out.println("Enter "+(row*col)+" elements of matrix a: ");

for (int i=0; i<row; i++)

{

        for (int j=0; j<col; j++)

        {

                a[i][j] = sc.nextInt();

        }

}

System.out.println("Enter "+(row*col)+" elements of matrix b: ");

for (int i=0; i<row; i++)

{

        for (int j=0; j<col; j++)

        {

                b[i][j] = sc.nextInt();

        }

}

System.out.println("Matrix a: ");

for (int i=0; i<row; i++)

{

        for (int j=0; j<col; j++)

        {

                System.out.print(a[i][j] + "\t");

        }

        System.out.print("\n");

}

System.out.println("Matrix b: ");

for (int i=0; i<row; i++)

{

        for (int j=0; j<col; j++)
```

```java
            {
                    System.out.print(b[i][j] + "\t");

            }
            System.out.print("\n");

    }
    for (int i=0; i<row; i++)

    {
            for (int j=0; j<col; j++)

            {
                    for (int k=0; k<row; k++)

                    {
                                    c[i][j] = c[i][j]+ a[i][k]*b[k][j];

                    }

            }

    }
    System.out.println(":: Final Matrix: ");

    sc.close();

    for (int i=0; i<row; i++)

    {
            for (int j=0; j<col; j++)

            {
                    System.out.print(c[i][j] + "\t");

            }
            System.out.print("\n");

    }

    }

}
```

Output:

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    JUPYTER: VARIABLES

PS C:\Users\Atharva\Documents\Java Pracical> javac MultiplyMatrices.java
1
2
Enter 9 elements of matrix b:
5
8
5
3
8
2
8
2
8
Matrix a:
3        4        5
8        2        9
6        1        2
Matrix b:
5        8        5
3        8        2
8        2        8
:: Final Matrix:
67       66       63
118      98       116
49       60       48
PS C:\Users\Atharva\Documents\Java Pracical>
```