

# Programming Assignment -1

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Class:- SE IT B

# C++ programs

1. Write a program to read two numbers from the keyboard and display the larger value on the screen

Program:-

```
#include<iostream>
using namespace std;

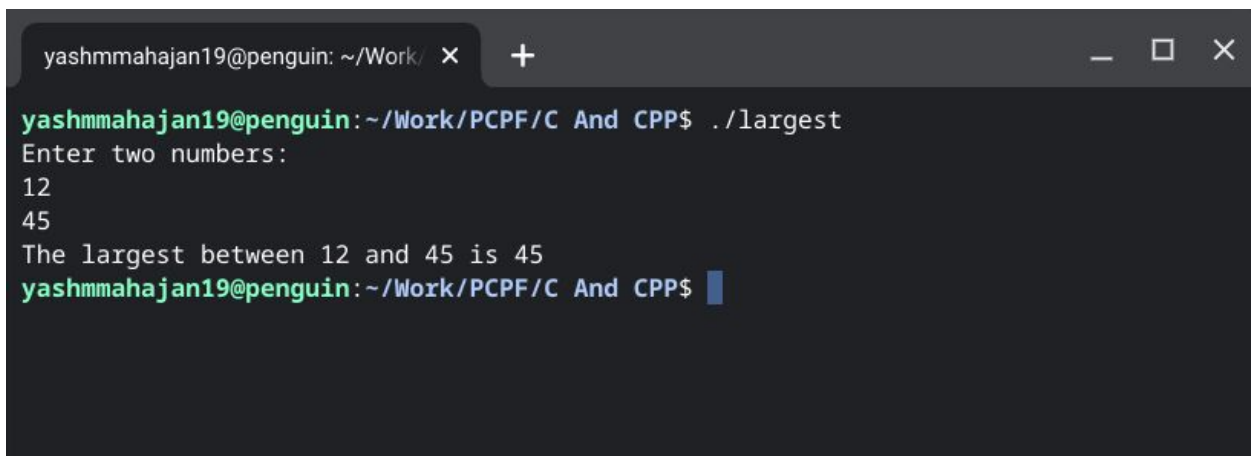
int main() {
    int num1, num2, max;
    cout << "Enter two numbers:" << endl;
    cin >> num1 >> num2;

    max = (num1 > num2) ? num1 : num2;

    cout << "The largest between " << num1 << " and " << num2 << " is " <<
max << endl ;

    return 0;
}
```

Output:-

A terminal window with a dark background. The title bar shows 'yashmmahajan19@penguin: ~/Work/' and window control buttons. The prompt is 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$'. The command './largest' has been executed. The program prompts 'Enter two numbers:' and the user has entered '12' and '45' on separate lines. The program then outputs 'The largest between 12 and 45 is 45'. The prompt is now 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$' with a blue cursor.

```
yashmmahajan19@penguin: ~/Work/ × +
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./largest
Enter two numbers:
12
45
The largest between 12 and 45 is 45
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$
```

2. Write a program to input an integer value from the keyboard and display on screen "WELL DONE" that many number of times.

Program:-

```
#include<iostream>
using namespace std;

int main() {

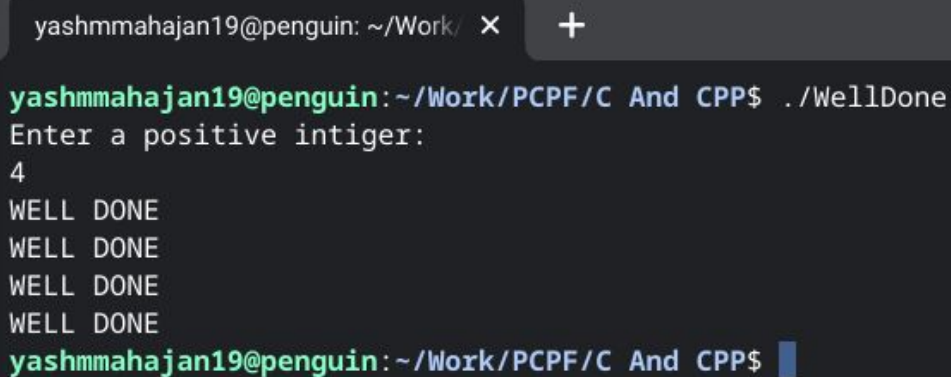
    int n;

    cout << "Enter a positive intiger:" << endl;
    cin >> n;

    for (int i = 0; i < n; i++)
    {
        cout << "WELL DONE" << endl;
    }

    return 0;
}
```

Output:-

A terminal window with a dark background. The title bar shows 'yashmmahajan19@penguin: ~/Work/' and window control buttons. The prompt is 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$'. The user enters './WellDone', followed by 'Enter a positive intiger:', then '4'. The output shows 'WELL DONE' printed four times on separate lines. The prompt returns at the bottom.

```
yashmmahajan19@penguin: ~/Work/
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./WellDone
Enter a positive intiger:
4
WELL DONE
WELL DONE
WELL DONE
WELL DONE
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$
```

3. Write a program to read the value of a,b and c and display the value of x where  $x=a/b-c$ . Test your program for the following values:

(a)  $a=250, b=85, c=25$

(b)  $a=300, b=70, c=70$

Program:-

```
#include<iostream>
using namespace std;

int main()
{
    float a, b, c, x;

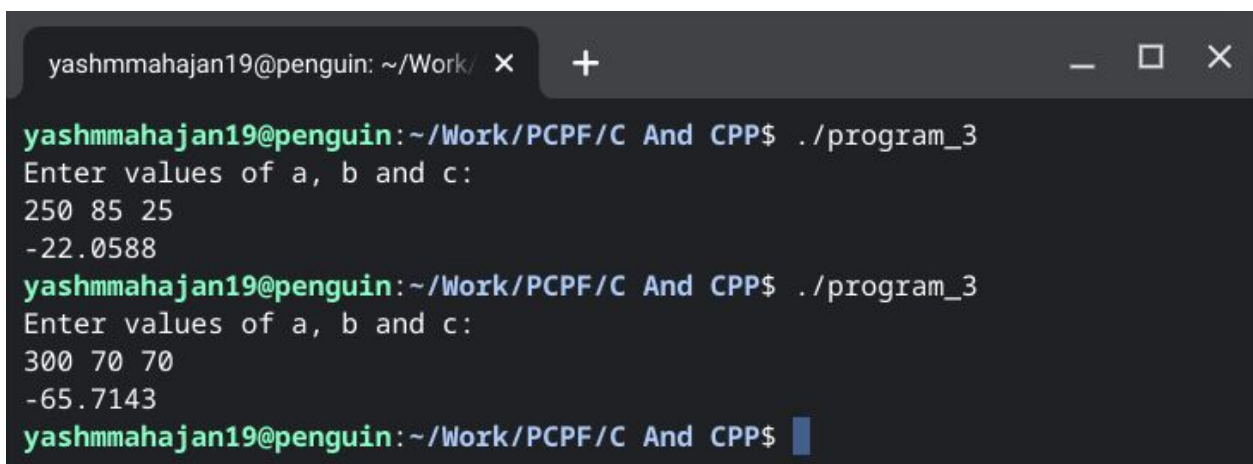
    cout << "Enter values of a, b and c:" << endl;
    cin >> a >> b >> c;

    x = a/b-c;

    cout << x << endl;

    return 0;
}
```

Output:-

A terminal window with a dark background and light green text. The window title is 'yashmmahajan19@penguin: ~/Work/'. The prompt is 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$'. The user enters './program\_3'. The program prompts 'Enter values of a, b and c:' and the user enters '250 85 25'. The program outputs '-22.0588'. The user enters './program\_3' again. The program prompts 'Enter values of a, b and c:' and the user enters '300 70 70'. The program outputs '-65.7143'. The prompt is 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$' with a cursor.

```
yashmmahajan19@penguin: ~/Work/
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_3
Enter values of a, b and c:
250 85 25
-22.0588
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_3
Enter values of a, b and c:
300 70 70
-65.7143
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$
```

4. Write a program that will ask for a temperature in Fahrenheit and display it in Celsius.

Program:-

```
#include<iostream>
using namespace std;

int main() {

    float temp_f, temp_c;

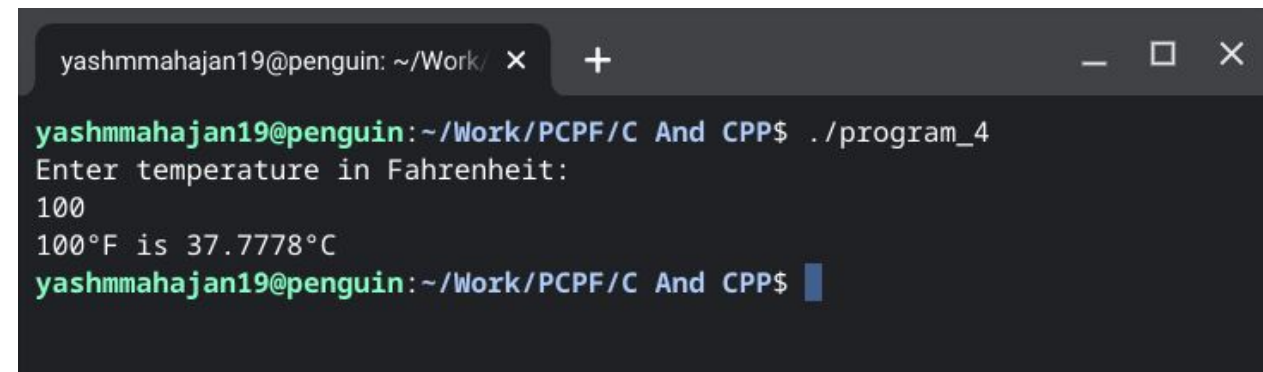
    cout << "Enter temperature in Fahrenheit:" << endl;
    cin >> temp_f;

    temp_c = ((temp_f-32)*5)/9;

    cout << temp_f << "°F is " << temp_c << "°C" << endl;

    return 0;
}
```

Output:-

A terminal window with a dark background. The title bar shows 'yashmmahajan19@penguin: ~/Work/' and window control buttons. The prompt is 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$'. The user enters './program\_4'. The program outputs 'Enter temperature in Fahrenheit:' followed by the user input '100'. The program then outputs '100°F is 37.7778°C'. The prompt returns to 'yashmmahajan19@penguin:~/Work/PCPF/C And CPP\$' with a cursor.

```
yashmmahajan19@penguin: ~/Work/
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_4
Enter temperature in Fahrenheit:
100
100°F is 37.7778°C
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$
```

5. Write a program to find the roots of quadratic equation for the following cases-

(a) determinant is greater than 0 (b) determinant is less than 0 (c) determinant is equal to 0

Program:-

```
#include<iostream>
#include<cmath>
using namespace std;
int main() {
    float a, b, c, disc, root1, root2, real_part, img_part;
    cout << "Enter coefficients a, b and c: ";
    cin >> a >> b >> c;
    disc = pow(b,2) - 4*a*c;

    if (disc > 0)
    {
        cout << "The roots are real and distinct" << endl;
        root1 = (-b + sqrt(disc))/(2*a);
        root2 = (-b - sqrt(disc))/(2*a);
        cout << "root1 = " << root1 << " root2 = " << root2 << endl;
    }
    else if (disc == 0)
    {
        cout << "The roots are real and same" << endl;
        root1 = (-b)/(2*a);
        cout << "root1 = root2 = " << root1 << endl;
    }
    else{
        cout << "The roots are imaginary and distinct" << endl;
        real_part = (-b)/(2*a);
        img_part =sqrt(-disc)/(2*a);
        cout << "x1 = " << real_part << "+" << img_part << "i" << endl;
        cout << "x2 = " << real_part << "-" << img_part << "i" << endl;
    }
    return 0;
}
```

Output:-

```
yashmmahajan19@penguin: ~/Work/ x + _ □ x
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_5
Enter coefficients a, b and c: 1 -5 6
The roots are real and distinct
root1 = 3 root2 = 2
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_5
Enter coefficients a, b and c: 1 2 1
The roots are real and same
root1 = root2 = -1
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$ ./program_5
Enter coefficients a, b and c: 4 2 1
The roots are imaginary and distinct
x1 = -0.25+0.433013i
x2 = -0.25-0.433013i
yashmmahajan19@penguin:~/Work/PCPF/C And CPP$
```

# Java programs

## 1. Write a java program to display Fibonacci series

Program:-

```
import java.util.Scanner;

class Fibonacci{

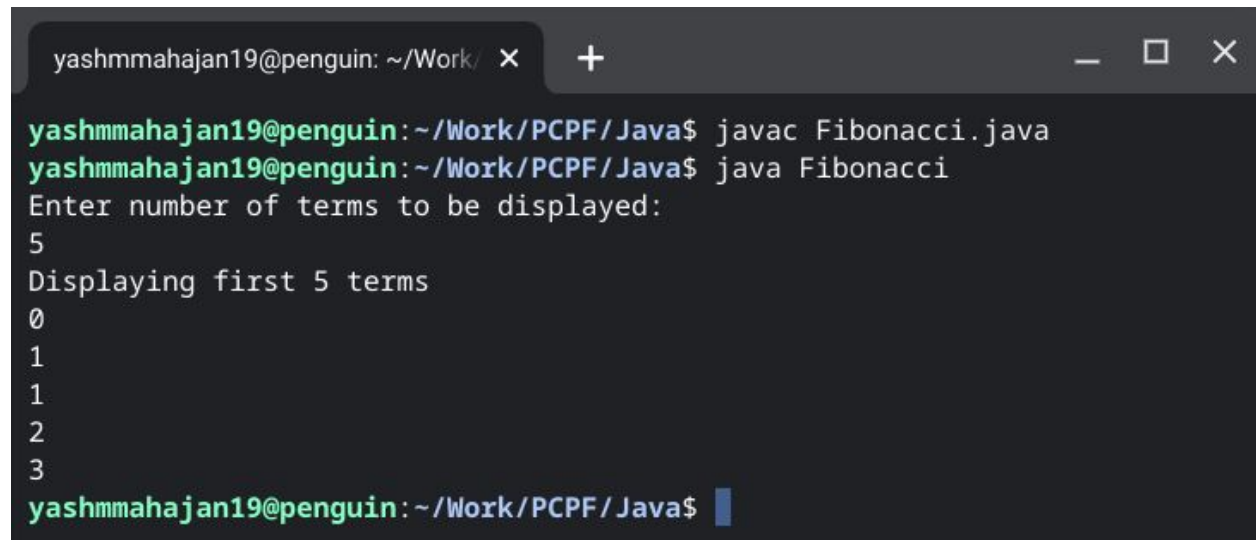
    public static void main(String[] args) {

        int n, a1 = 0, a2 = 1;
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter number of terms to be displayed:");
        n = scanner.nextInt();
        System.out.println("Displaying first "+ n +" terms");

        for (int i = 0; i < n; i++) {
            System.out.println(a1);
            int sum = a1 + a2;
            a1 = a2;
            a2 = sum;
        }
        scanner.close();
    }
}
```



Output:-



```
yashmmahajan19@penguin: ~/Work/ x + _ □ ×  
yashmmahajan19@penguin:~/Work/PCPF/Java$ javac Fibonacci.java  
yashmmahajan19@penguin:~/Work/PCPF/Java$ java Fibonacci  
Enter number of terms to be displayed:  
5  
Displaying first 5 terms  
0  
1  
1  
2  
3  
yashmmahajan19@penguin:~/Work/PCPF/Java$
```

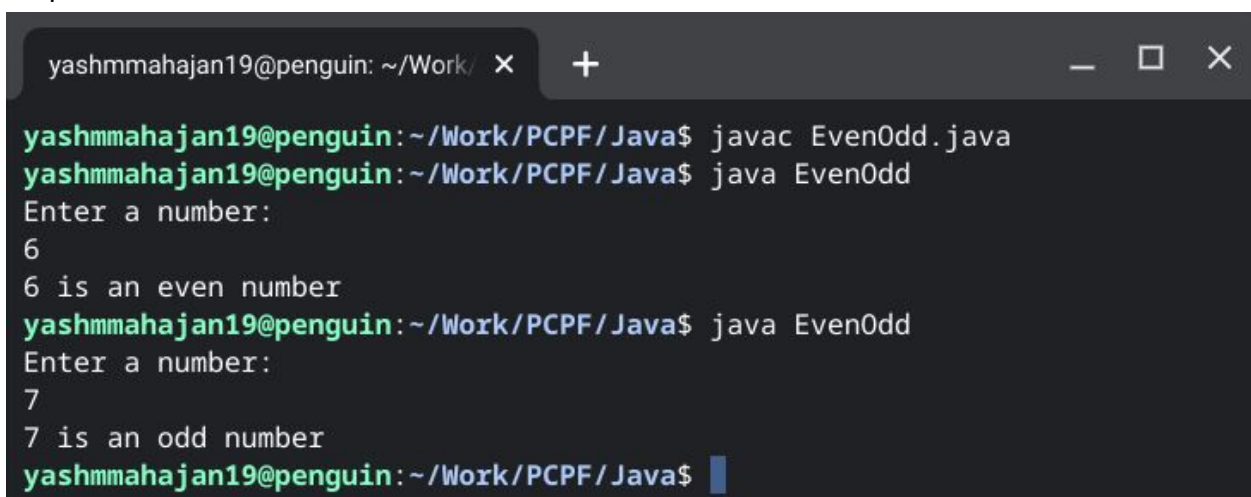
2. Write a java program to check if the number is even or odd using if-else statement

Program:-

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

    public static void main(String[] args) {
        int num;
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a number:");
        num = scanner.nextInt();
        if (num%2 == 0) {
            System.out.println(num + " is an even number");
        }
        else{
            System.out.println(num + " is an odd number");
        }
        scanner.close();
    }
}
```

Output:-



```
yashmmahajan19@penguin: ~/Work/ x + _ □ x
yashmmahajan19@penguin:~/Work/PCPF/Java$ javac EvenOdd.java
yashmmahajan19@penguin:~/Work/PCPF/Java$ java EvenOdd
Enter a number:
6
6 is an even number
yashmmahajan19@penguin:~/Work/PCPF/Java$ java EvenOdd
Enter a number:
7
7 is an odd number
yashmmahajan19@penguin:~/Work/PCPF/Java$
```

### 3. Write a java program to calculate power of a number

Program:-

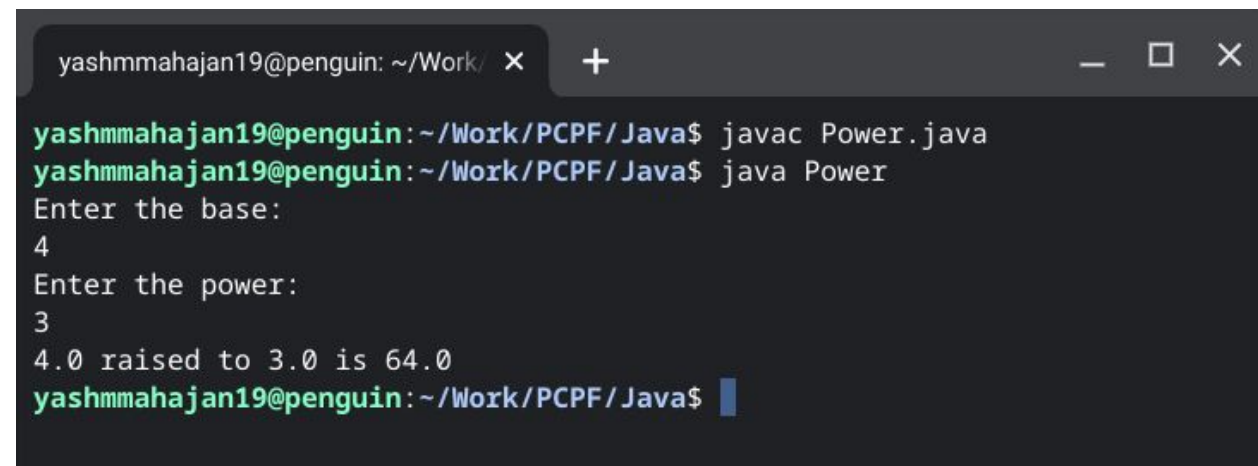
```
import java.util.Scanner;
public class Power {
    public static void main(String[] args) {

        double base, product = 1, power;
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter the base:");
        base = scanner.nextDouble();
        System.out.println("Enter the power:");
        power = scanner.nextDouble();

        for (int i = 0; i < power; i++) {
            product *= base;
        }

        System.out.println(base+" raised to "+power+" is "+product);
        scanner.close();
    }
}
```

Output:-

A terminal window with a dark background and light green text. The window title bar shows 'yashmmahajan19@penguin: ~/Work/' and standard window controls. The terminal shows the user compiling and running the 'Power.java' file. The program prompts for a base and a power, and then outputs the result of the calculation.

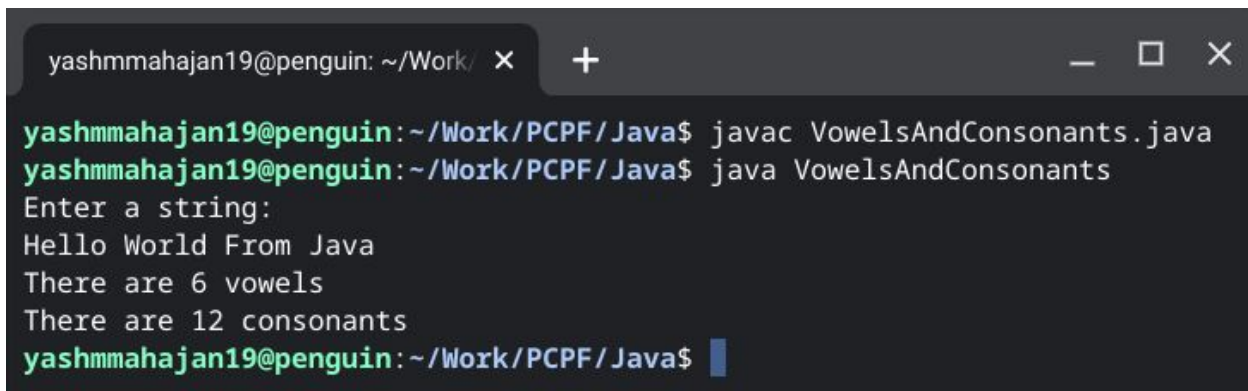
```
yashmmahajan19@penguin: ~/Work/PCPF/Java$ javac Power.java
yashmmahajan19@penguin: ~/Work/PCPF/Java$ java Power
Enter the base:
4
Enter the power:
3
4.0 raised to 3.0 is 64.0
yashmmahajan19@penguin: ~/Work/PCPF/Java$
```

4. Write a java program to count the number of vowels and consonants in a string

Program:-

```
import java.util.Scanner;
public class VowelsAndConsonants {
    public static void main(String[] args) {
        int vowels = 0, consonants = 0;
        Scanner scanner = new Scanner(System.in);
        System.out.println("Enter a string:");
        String str = scanner.nextLine();
        String string = str.toLowerCase();
        for (int i = 0; i < string.length(); i++) {
            char c = string.charAt(i);
            if(c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u') {
                ++vowels;
            }
            else if((c >= 'a' && c <= 'z')) {
                ++consonants;
            }
        }
        System.out.println("There are "+vowels+" vowels");
        System.out.println("There are "+consonants+" consonants");
        scanner.close();
    }
}
```

Output:-



The screenshot shows a terminal window with the following content:

```
yashmmahajan19@penguin: ~/Work/ x + _ □ x
yashmmahajan19@penguin:~/Work/PCPF/Java$ javac VowelsAndConsonants.java
yashmmahajan19@penguin:~/Work/PCPF/Java$ java VowelsAndConsonants
Enter a string:
Hello World From Java
There are 6 vowels
There are 12 consonants
yashmmahajan19@penguin:~/Work/PCPF/Java$
```

## 5. Write a Java program to add two matrixes using multi-dimensional array

Program:-

```
import java.util.Scanner;

public class Matrix {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        int m,n;

        System.out.println("Enter number of rows:");
        m = scanner.nextInt();

        System.out.println("Enter number of ccolumns:");
        n = scanner.nextInt();

        int MatrixA[][] = new int[m][n];

        System.out.println("Enter Elements of Matrix A:");

        for (int i = 0; i < m; i++)
            for (int j = 0; j < n; j++)
                MatrixA[i][j] = scanner.nextInt();

        int MatrixB[][] = new int[m][n];

        System.out.println("Enter Elements of Matrix B:");

        for (int i = 0; i < m; i++)
            for (int j = 0; j < n; j++)
                MatrixB[i][j] = scanner.nextInt();

        int[][] sum = new int[m][n];
```

```

        for(int i = 0; i < m; i++)
            for (int j = 0; j < n; j++)
                sum[i][j] = MatrixA[i][j] + MatrixB[i][j];

        System.out.println("The sum of Matrix A and Matrix B is:");

        for(int i = 0; i < m; i++){
            for (int j = 0; j < n; j++){
                System.out.print(sum[i][j] + " ");
            }
            System.out.println();
        }
        scanner.close();
    }
}

```

Output:-

```

yashmmahajan19@penguin: ~/Work/ × + _ □ ×
yashmmahajan19@penguin:~/Work/PCPF/Java$ javac Matrix.java
yashmmahajan19@penguin:~/Work/PCPF/Java$ java Matrix
Enter number of rows:
3
Enter number of ccolums:
3
Enter Elements of Matrix A:
1 2 3
4 5 6
7 8 9
Enter Elements of Matrix B:
9 8 7
6 5 4
3 2 1
The sum of Matrix A and Matrix B is:
10 10 10
10 10 10
10 10 10
yashmmahajan19@penguin:~/Work/PCPF/Java$

```