

Advanced Programming Lab

Assignment on Mid-term

Submitted to

Mahbubur Rahman

Assistant Professor

Dept. of CSE

Bangladesh University of Business and Technology

Submitted by

Ridwanur Rahman Mazumder

CSE intake - 49

Id: 21225103079

Sec: 04

(1) Write a Java program to print the sum, divide, and product of two numbers.

Code Implementation:

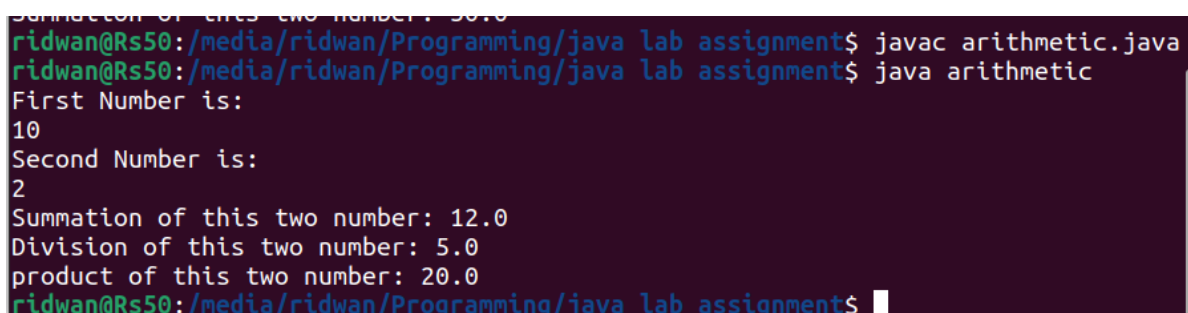
```
import java.util.Scanner;

public class arithmetic{
    public static void main(String[] args){
        Scanner scanner = new Scanner(System.in);
        double A;
        double B;
        double sum=0;
        double mul=1;
        double div=0;

        System.out.println("First Number is: ");
        A= scanner.nextDouble();
        System.out.println("Second Number is: ");
        B= scanner.nextDouble();
        sum=A+B;
        mul=A*B;
        div=A/B;
        System.out.println("Summation of this two number: "+ sum);
        System.out.println("Division of this two number: "+ div);
        System.out.println("product of this two number: "+ mul);

    }
}
```

Output:



```
Summation of this two number: 12.0
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ javac arithmetic.java
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ java arithmetic
First Number is:
10
Second Number is:
2
Summation of this two number: 12.0
Division of this two number: 5.0
product of this two number: 20.0
ridwan@Rs50:/media/ridwan/Programming/iava lab assionments$
```

(2) Write a Java program to print the area and perimeter of a circle.

Code Implementation:

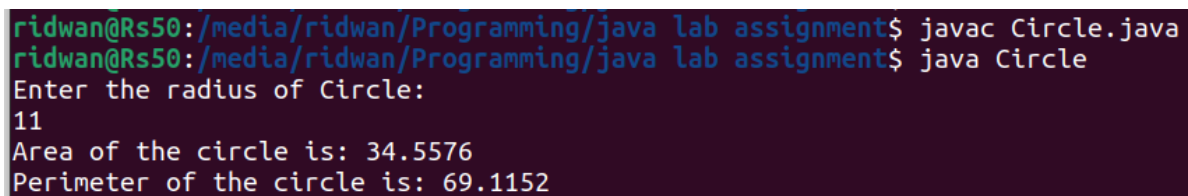
```
import java.util.Scanner;
public class Circle{
    public static void main(String[] args){
        Scanner scanner = new Scanner(System.in);
        double radius;
        double area=1;
        double perimeter=0;

        System.out.println("Enter the radius of Circle: ");
        radius = scanner.nextDouble();
        area = 3.1416*radius;
        perimeter= 2*3.1416*radius;
        System.out.println("Area of the circle is: "+ area);
        System.out.println("Perimeter of the circle is: "+ perimeter);

    }

}
```

Output:



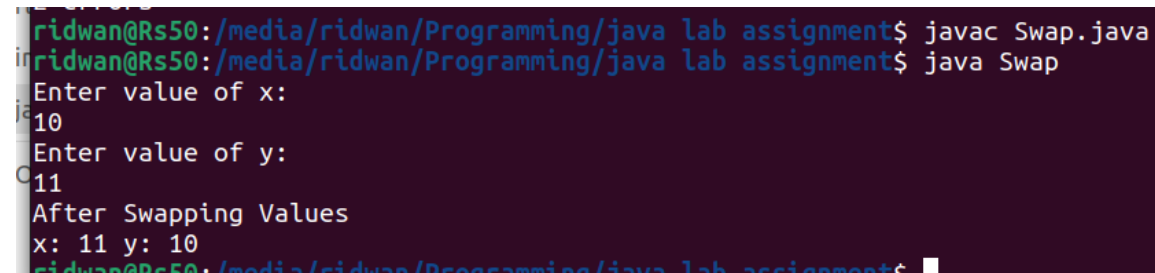
```
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ javac Circle.java
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ java Circle
Enter the radius of Circle:
11
Area of the circle is: 34.5576
Perimeter of the circle is: 69.1152
```

(3) Write a Java program to swap two variables without using a third variable.

Code Implementation:

```
import java.util.Scanner;
public class Swap{
    public static void main(String[] args){
        Scanner scanner = new Scanner(System.in);
        int x; int y;
        System.out.println("Enter value of x: ");
        x=scanner.nextInt();
        System.out.println("Enter value of y: ");
        y=scanner.nextInt();
        System.out.println("After Swapping Values");
        x=x+y;
        y=x-y;
        x=x-y;
        System.out.println("x: "+ x +" y: "+y);
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ javac Swap.java
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ java Swap
Enter value of x:
10
Enter value of y:
11
After Swapping Values
x: 11 y: 10
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$
```

(4) Write a Java program and compute the sum of the digits of an integer.
(Such as: Input an integer: 45; Expected Output : The sum of the digits is: 9

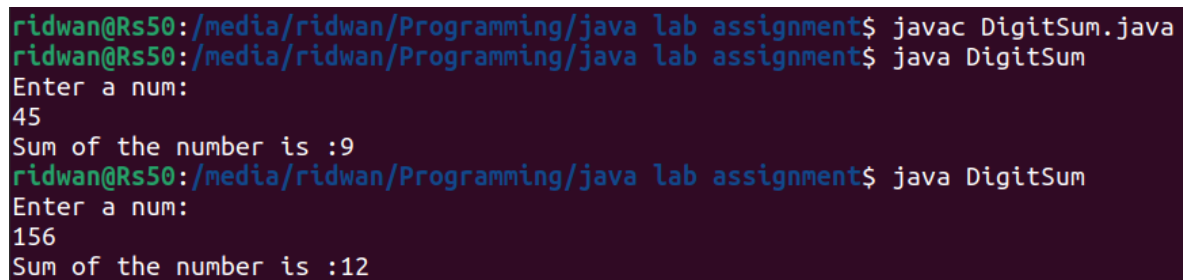
Code Implementation:

```
import java.util.Scanner;

public class DigitSum{
    public static void main(String[] args){
        Scanner scanner = new Scanner(System.in);
        int num; int temp1=0; int sum=0;

        System.out.println("Enter a num: ");
        num=scanner.nextInt();
        while(num!=0){
            temp1=num%10;
            sum+=temp1;
            num=num/10;
        }
        System.out.println("Sum of the number is :"+ sum);
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ javac DigitSum.java
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ java DigitSum
Enter a num:
45
Sum of the number is :9
ridwan@Rs50:/media/ridwan/Programming/java lab assignment$ java DigitSum
Enter a num:
156
Sum of the number is :12
```

5. Write a Java program to reverse a number.

Java Lab Report: Program to Reverse a Number

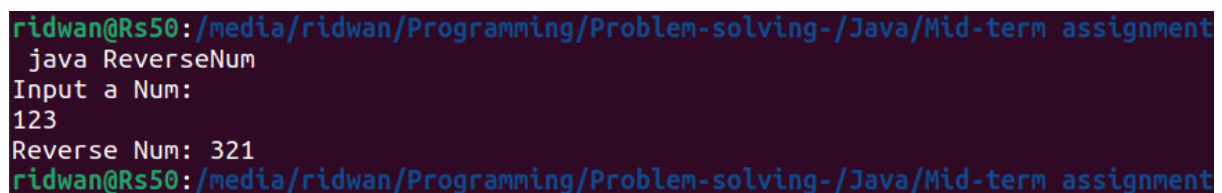
Code Implementation:

```
import java.util.Scanner;

public class ReverseNum{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Input a Num: ");
        int Num = input.nextInt();
        int Output = reverse(Num);
        System.out.println("Reverse Num: "+Output);
    }

    public static int reverse(int n){
        int reverse = 0;
        while( n!=0 ){
            int temp = n%10;
            reverse = reverse * 10 + temp;
            n/=10;
        }
        return reverse;
    }
}
```

Output:



```
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment
java ReverseNum
Input a Num:
123
Reverse Num: 321
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment
```

6. Write a Java program to count the letters, spaces, numbers and other characters of an input string.

Code Implementation:

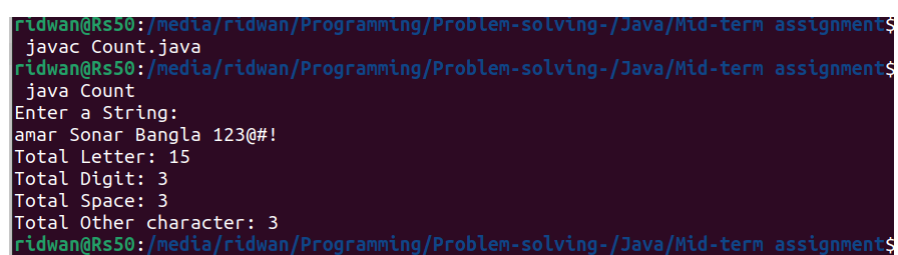
```
import java.util.Scanner;

public class Count{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter a String: ");
        String str = input.nextLine();

        int letterCount=0;
        int spaceCount=0;
        int numberCount=0;
        int otherCount=0;

        for(int i=0;i<str.length();i++){
            char c = str.charAt(i);
            if(Character.isLetter(c)){
                letterCount++;
            }
            else if(Character.isDigit(c)){
                numberCount++;
            }
            else if(Character.isWhitespace(c)){
                spaceCount++;
            }
            else{
                otherCount++;
            }
        }
        System.out.println("Total Letter: "+letterCount);
        System.out.println("Total Digit: "+numberCount);
        System.out.println("Total Space: "+spaceCount);
        System.out.println("Total Other character: "+otherCount);
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programing/Problem-solving-/Java/Mid-term assignment$
javac Count.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
java Count
Enter a String:
amar Sonar Bangla 123@#!
Total Letter: 15
Total Digit: 3
Total Space: 3
Total Other character: 3
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
```

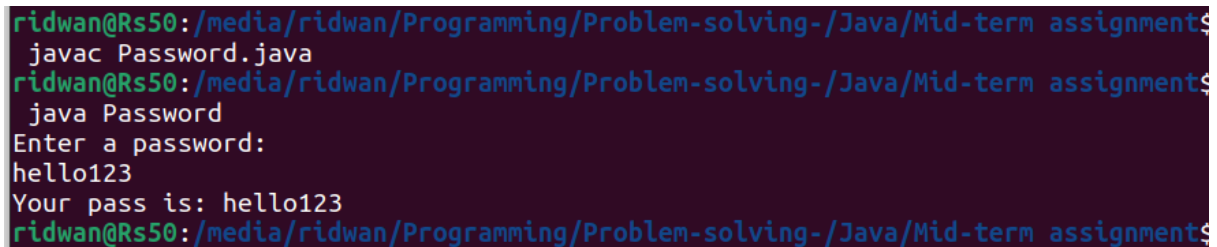
7. Write a Java program to input and display your password.

Code Implementation:

```
import java.util.Scanner;

public class Password{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter a password: ");
        String pass = input.nextLine();
        System.out.println("Your pass is: "+pass);
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
javac Password.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
java Password
Enter a password:
hello123
Your pass is: hello123
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
```

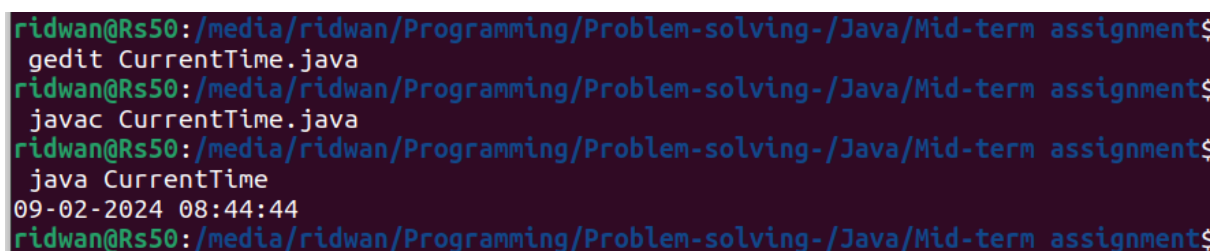
8. Write a Java program to display the current date time in specific format.

Code Implementation:

```
import java.time.LocalDateTime;
import java.time.format.DateTimeFormatter;

public class CurrentTime{
    public static void main(String[] args){
        LocalDateTime obj = LocalDateTime.now();
        DateTimeFormatter format = DateTimeFormatter.ofPattern("dd-MM-yyyy
HH:mm:ss");
        String output = obj.format(format);
        System.out.println(output);
    }
}
```

Output:



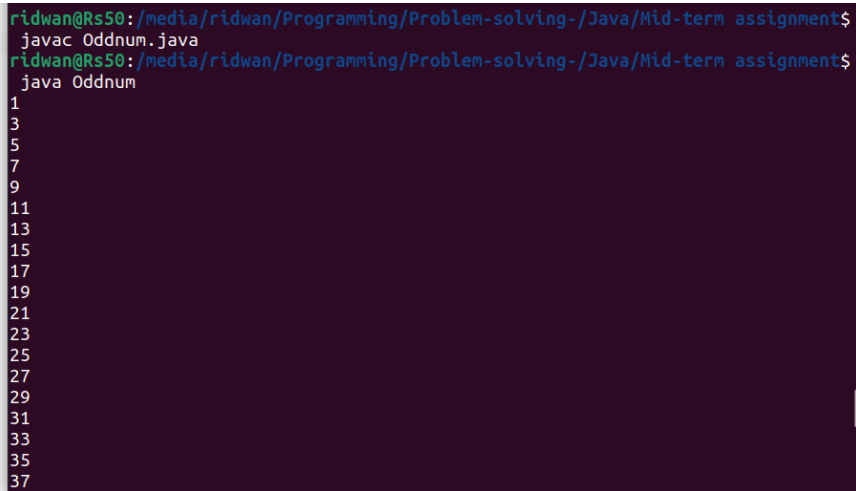
```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
gedit CurrentTime.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
javac CurrentTime.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
java CurrentTime
09-02-2024 08:44:44
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignments$
```


9. Write a Java program to print the odd numbers from 1 to 99. Prints one number per line

Code Implementation:

```
public class Oddnum{
    public static void main(String[] args){
        int i;
        for(i=1;i<=99;i++){
            System.out.println(i);
            i++;
            //System.out.println(i);
        }
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
javac Oddnum.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
java Oddnum
1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
```

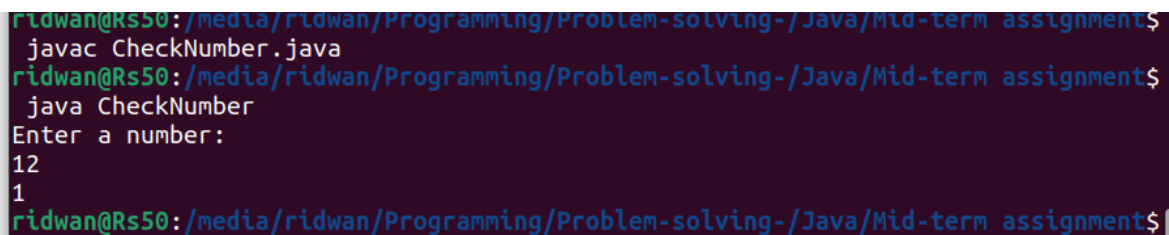
10. Write a Java program to accept a number and check if the number is even or not. Prints 1 if the number is even or 0 if the number is odd.

Code Implementation:

```
import java.util.Scanner;

public class CheckNumber{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);
        System.out.println("Enter a number: ");
        int num = input.nextInt();
        if(num%2==0){
            System.out.println("1");
        }
        else{
            System.out.println("0");
        }
    }
}
```

Output:

A terminal window with a dark background and light-colored text. The prompt is 'ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment\$'. The user enters 'javac CheckNumber.java', followed by 'java CheckNumber'. The program prompts 'Enter a number:' and the user enters '12'. The program outputs '1'. The prompt is then 'ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment\$'.

```
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
javac CheckNumber.java
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
java CheckNumber
Enter a number:
12
1
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
```

11. Write a Java program to reverse a word.

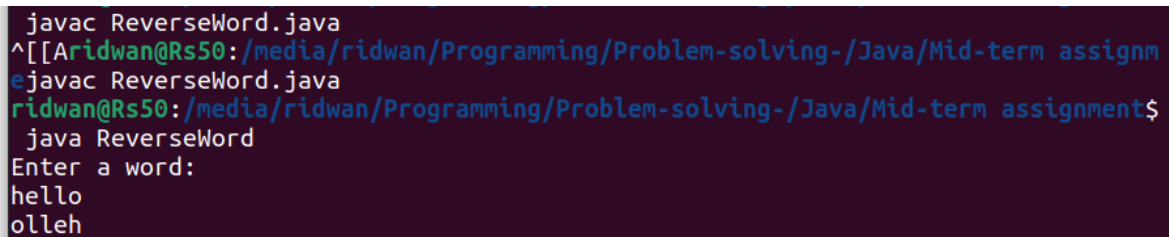
Code Implementation:

```
import java.util.Scanner;

public class ReverseWord{
    public static void main(String[] args){

        System.out.println("Enter a word: ");
        Scanner input = new Scanner(System.in);
        String str = input.nextLine();
        String str2 = "";
        for(int i=str.length()-1;i>=0;i--){
            char temp1 = str.charAt(i);
            str2 += temp1;
        }
        System.out.println(str2);
    }
}
```

Output:



```
javac ReverseWord.java
^[[Aridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignm
ejavac ReverseWord.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term assignment$
java ReverseWord
Enter a word:
hello
olleh
```

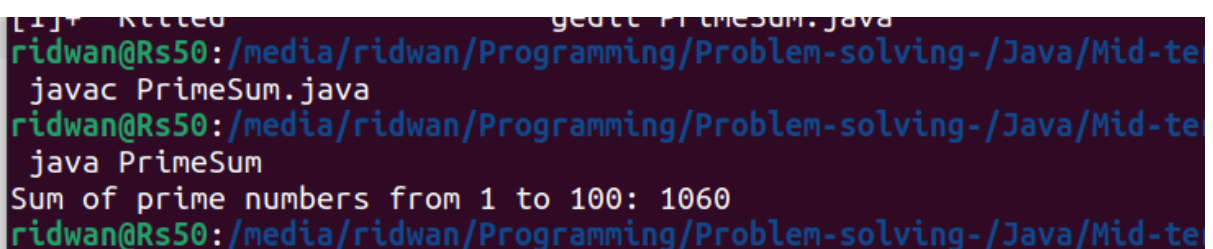
12. Write a Java program to compute the sum of the first 100 prime numbers.

Code Implementation:

```
class ReturnValue {
    int PrimeOrNot(int n) {
        if (n <= 1) {
            return 0;
        }
        for (int i = 2; i <= Math.sqrt(n); i++) {
            if (n % i == 0) {
                return 0;
            }
        }
        return n;
    }
}

class PrimeSum {
    public static void main(String[] args) {
        ReturnValue obj = new ReturnValue();
        int sum = 0;
        for (int i = 1; i <= 100; i++) {
            sum += obj.PrimeOrNot(i);
        }
        System.out.println("Sum of prime numbers from 1 to 100: " + sum);
    }
}
```

Output:



```
[1]+  Killed                  gcc -c PrimeSum.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-te
javac PrimeSum.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-te
java PrimeSum
Sum of prime numbers from 1 to 100: 1060
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-te
```

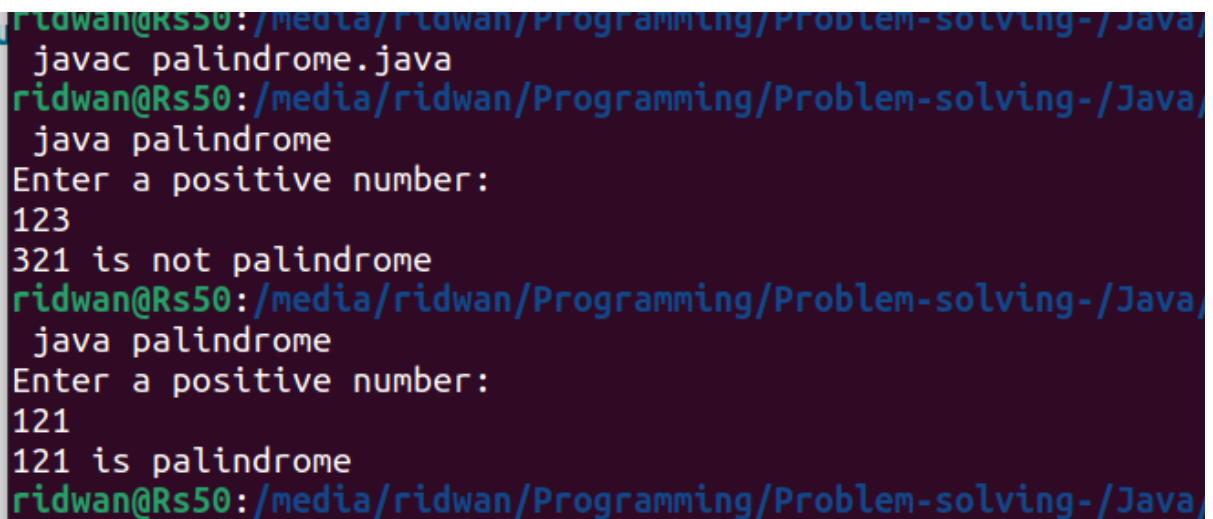
13. Write a Java program to check if a positive number is a palindrome or not.

Code implementation:

```
import java.util.Scanner;
public class palindrome{
    public static void main(String[] args){
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter a positive number: ");
        int input = obj.nextInt();
        int reverseNum=0;
        int temp = input;
        while(input>0){
            int num = input%10;
            reverseNum = reverseNum*10+num;
            input=input/10;
        }
        if(temp==reverseNum){
            System.out.println(reverseNum+" is palindrome");
        }
        else{
            System.out.println(reverseNum+" is not palindrome");
        }
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
javac palindrome.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
java palindrome
Enter a positive number:
123
321 is not palindrome
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
java palindrome
Enter a positive number:
121
121 is palindrome
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
```

14. Write a Java Program to find the largest of three numbers using if-else.

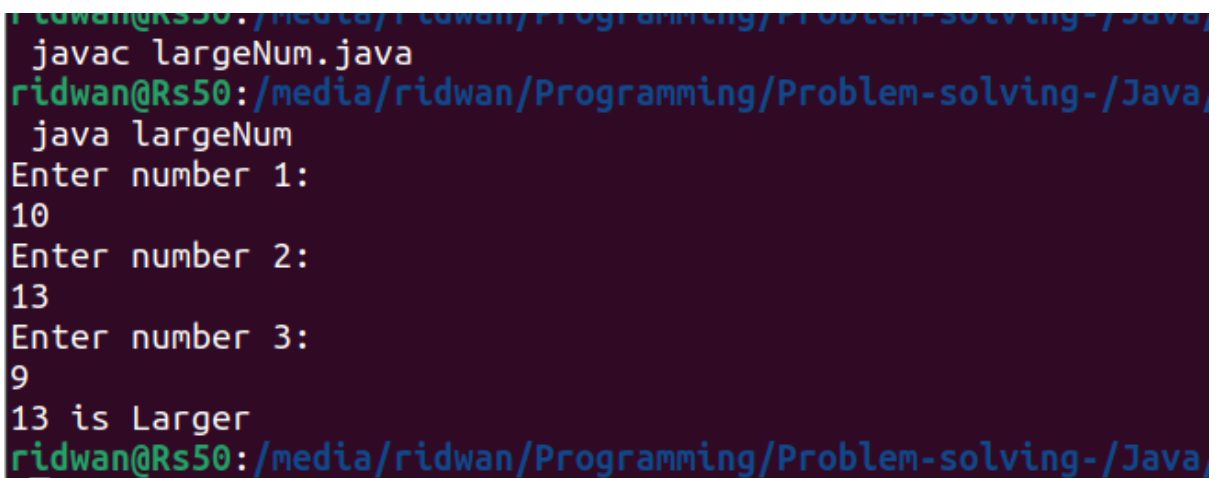
Code Implementation:

```
import java.util.Scanner;
public class largeNum{
    public static void main(String[] args){
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter number 1: ");
        int num1 = obj.nextInt();
        System.out.println("Enter number 2: ");
        int num2 = obj.nextInt();
        System.out.println("Enter number 3: ");
        int num3 = obj.nextInt();

        if(num1>num2 && num1>num3){
            System.out.println(num1+" is Larger");
        }
        else if(num2>num1 && num2>num3){
            System.out.println(num2+" is Larger");
        }
        else{
            System.out.println(num3+" is Larger");
        }
    }
}
```

Output:



```
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
javac largeNum.java
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
java largeNum
Enter number 1:
10
Enter number 2:
13
Enter number 3:
9
13 is Larger
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
```

15. Write a Java Program to check if a number is positive or negative.

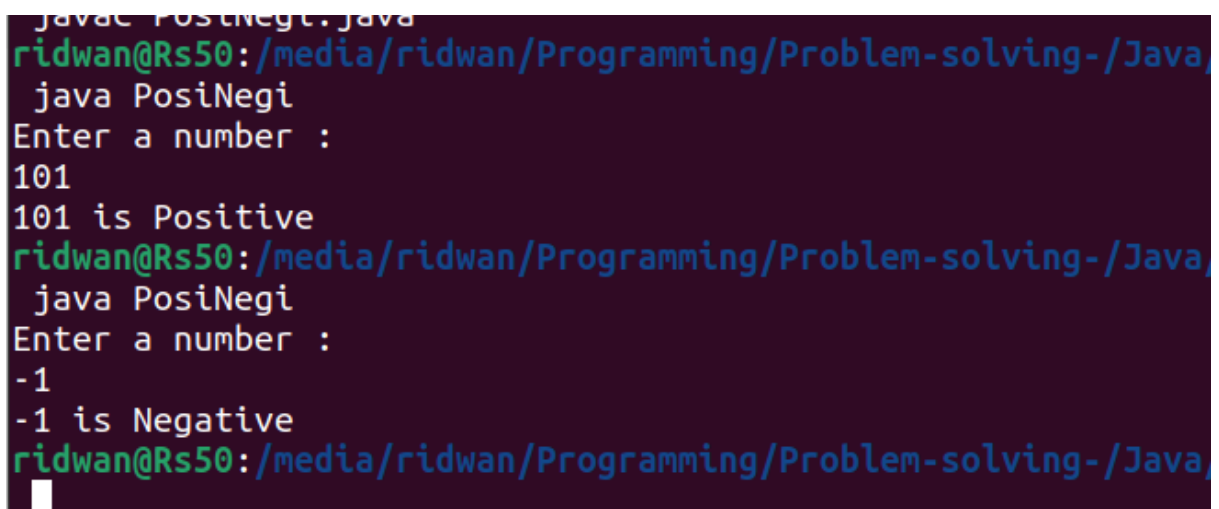
Code Implementation:

```
import java.util.Scanner;
public class PosiNegi{
    public static void main(String[] args){
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter a number : ");
        int num1 = obj.nextInt();

        if(num1>0){
            System.out.println(num1+" is Positive");
        }
        else{
            System.out.println(num1+" is Negative");
        }
    }
}
```

Output:



```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
java PosiNegi
Enter a number :
101
101 is Positive
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
java PosiNegi
Enter a number :
-1
-1 is Negative
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java,
```

16. Write a Java Program to check whether a char is vowel or Consonant using Switch Case

Code Implementation:

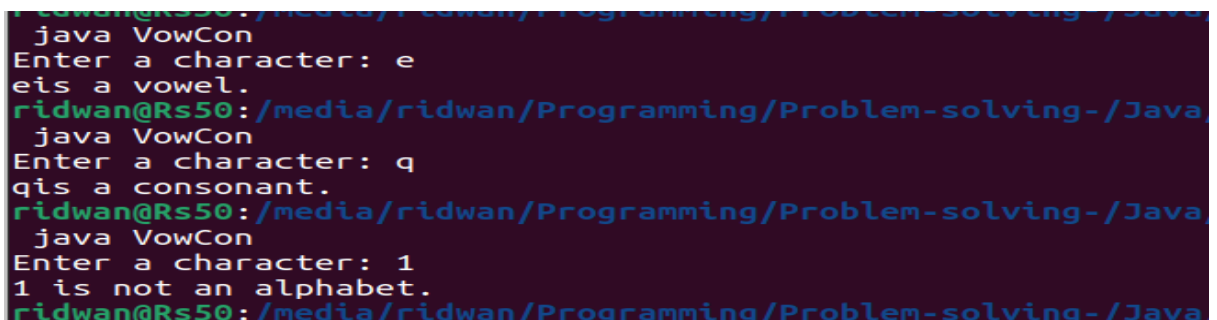
```
import java.util.Scanner;

public class VowCon{
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.print("Enter a character: ");
        char ch = scanner.next().charAt(0);
        ch = Character.toLowerCase(ch);

        switch(ch) {
            case 'a':
            case 'e':
            case 'i':
            case 'o':
            case 'u':
                System.out.println(ch+ "is a vowel.");
                break;
            default:
                if ((ch >= 'a' && ch <= 'z')) {
                    System.out.println(ch+ "is a consonant.");
                } else {
                    System.out.println(ch+" is not an alphabet.");
                }
        }
    }
}
```

Output:



```
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
java VowCon
Enter a character: e
eis a vowel.
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
java VowCon
Enter a character: q
qis a consonant.
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
java VowCon
Enter a character: 1
1 is not an alphabet.
ridwan@Rs50: /media/ridwan/Programming/Problem-solving-/Java
```


17. Write a Java Program to make a Simple Calculator using Switch Case.

Code Implementation:

```
import java.util.Scanner;

public class Calculator{
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.println("Enter number 1 :");
        double num1 = input.nextDouble();

        System.out.println("Enter operation which you want: ");
        char operator = input.next().charAt(0);

        System.out.println("Enter number 2 :");
        double num2 = input.nextDouble();

        double result = 0;

        switch (operator) {
            case '+':
                result = num1 + num2;
                break;
            case '-':
                result = num1 - num2;
                break;
            case '*':
                result = num1 * num2;
                break;
            case '/':
                if (num2 != 0) {
                    result = num1 / num2;
                } else {
                    System.out.println("divisible by 0");
                    return;
                }
                break;
            default:
                System.out.println("Invalid operator.");
                return;
        }

        System.out.println("Ans: " + result);
    }
}
```

Output:

```
1 error
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term a
javac Calculator.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term a
java Calculator
Enter number 1 :
10
Enter operation which you want:
-
Enter number 2 :
1
Ans: 9.0
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-term a
```

18. Write a Java Program to find factorial of a number using loops.

Code Implementation:

```
import java.util.Scanner;
public class Factorial{
    public static void main(String[] args){
        Scanner input = new Scanner(System.in);

        System.out.println("Enter a num: ");
        int num = input.nextInt();
        int output = 1;
        System.out.println("Factorial of" + num + "is : ");
        for(int i=num; i>=1; i--){
            output *= i;
        }
        System.out.println(output);
    }
}
```

Output:

```
120
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-
javac Factorial.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-
java Factorial
Enter a num:
5
Factorial of5is :
120
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/Java/Mid-
```

19. Write a Java Program to print Fibonacci Series using loop.

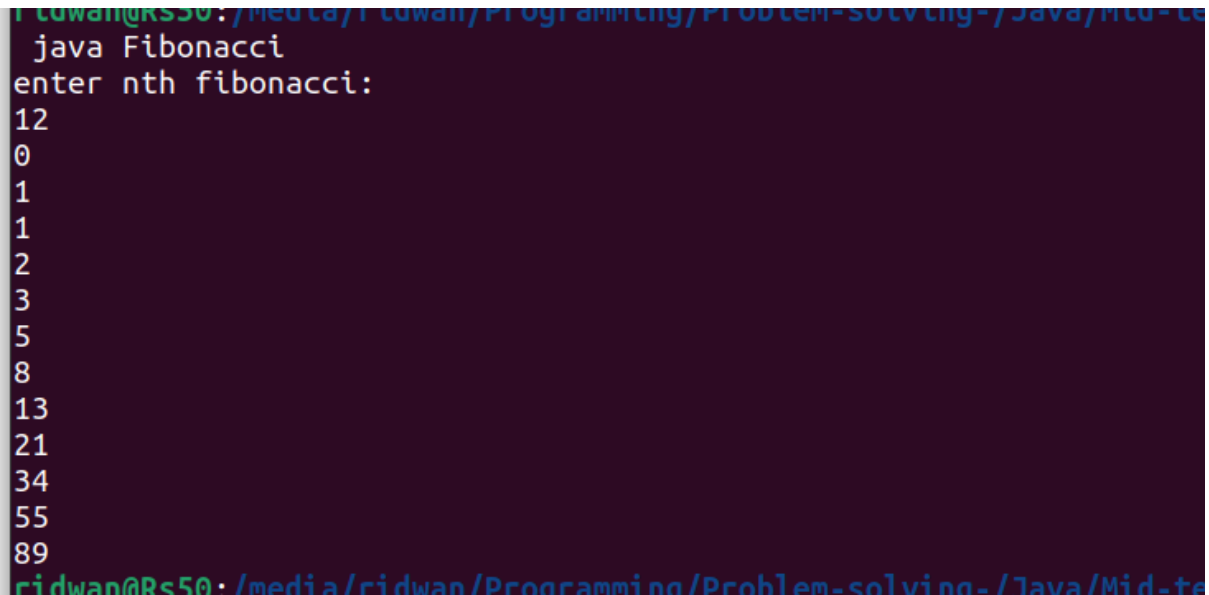
Code Implementation:

```
import java.util.Scanner;

public class Fibonacci{
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);

        System.out.println("enter nth fibonacci: ");
        int input = obj.nextInt();
        int first=0;
        int second=1;
        for(int i = 0; i < input; i++){
            System.out.println(first);
            int temp = first + second;
            first = second;
            second = temp;
        }
    }
}
```

Output



```
cidwan@KS50: /media/cidwan/Programming/Problem-solving-/Java/Mid-te
java Fibonacci
enter nth fibonacci:
12
0
1
1
2
3
5
8
13
21
34
55
89
cidwan@Bs50: /media/cidwan/Programming/Problem-solving-/Java/Mid-te
```

20. Write a Java program to Find the Second largest element in an array.

Code Implementation:

```
import java.util.Arrays;
import java.util.Scanner;

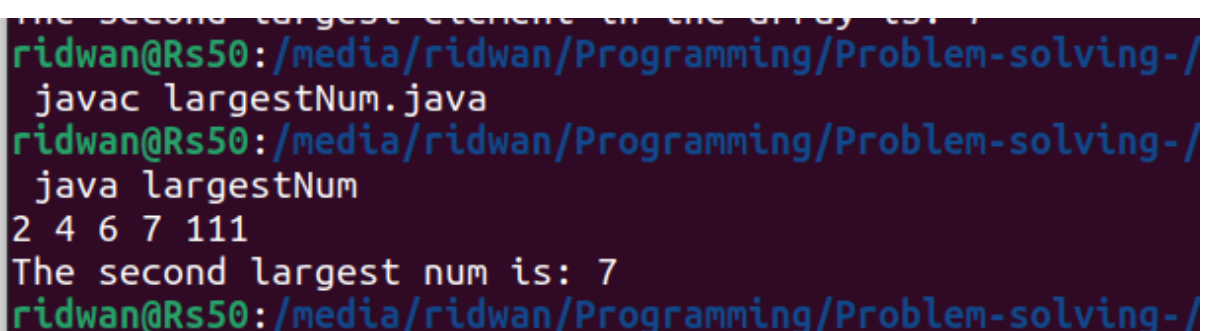
public class largestNum{
    public static void main(String[] args) {
        final int size = 5;

        Scanner obj = new Scanner(System.in);

        int[] array = new int[size];
        for (int i = 0; i < size; i++) {
            array[i] = obj.nextInt();
        }

        Arrays.sort(array);
        int secondlarge = array[size - 2];
        System.out.println("The second largest num is: " + secondlarge);
    }
}
```

Output



```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/
javac largestNum.java
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/
java largestNum
2 4 6 7 111
The second largest num is: 7
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/
```

21. Write a Java program to Reverse words in a given string

Code Implementation:

```
import java.util.Scanner;

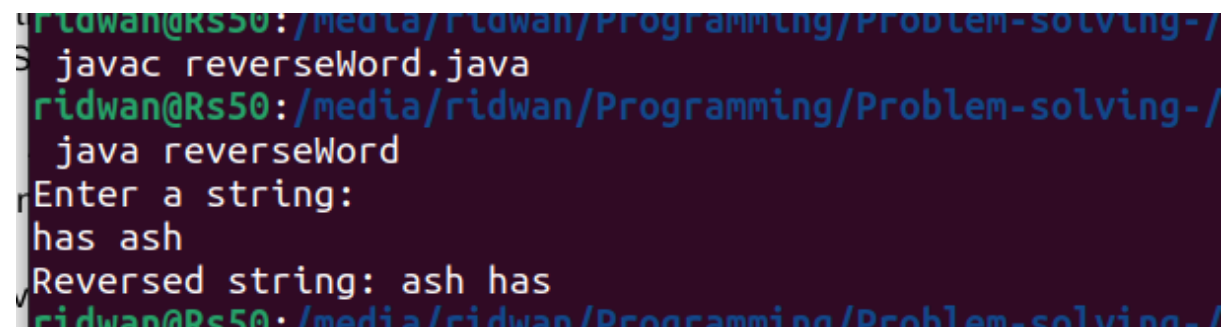
public class reverseWord{
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter a string:");
        String inputString = obj.nextLine();

        String[] words = inputString.split("\\s+");
        StringBuilder reversedString = new StringBuilder();

        for (int i = words.length - 1; i >= 0; i--) {
            reversedString.append(words[i]).append(" ");
        }
        System.out.println("Reversed string: " + reversedString.toString().trim());
    }
}
```

Output



```
ridwan@RS50: /media/ridwan/Programming/Problem-solving- /
$ javac reverseWord.java
ridwan@Rs50: /media/ridwan/Programming/Problem-solving- /
$ java reverseWord
Enter a string:
has ash
Reversed string: ash has
ridwan@Rs50: /media/ridwan/Programming/Problem-solving- /
```

22. Write a program in Java to count the total number of alphabets, digits and special characters in a string.

Code Implementation:

```
import java.util.Scanner;

public class Counter{
    public static void main(String[] args) {
        Scanner obj = new Scanner(System.in);

        System.out.println("Enter a string:");
        String inputStr = obj.nextLine();

        int CountAlphabet = 0;
        int CountDigit = 0;
        int CountSpecialChar = 0;
        for (int i = 0; i < inputStr.length(); i++) {
            char ch = inputStr.charAt(i);

            if (Character.isLetter(ch)) {
                CountAlphabet++;
            }
            else if (Character.isDigit(ch)) {
                CountDigit++;
            }
            else {
                CountSpecialChar++;
            }
        }

        System.out.println("Total alphabets: "+CountAlphabet);
        System.out.println("Total digits: "+CountDigit);
        System.out.println("Total special characters: "+CountSpecialChar);
    }
}
```

Output

```
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/:  
java Counter  
Enter a string:  
hello java programming Lab 1234  
Total alphabets: 23  
Total digits: 4  
Total special characters: 4  
ridwan@Rs50:/media/ridwan/Programming/Problem-solving-/:
```

23. Write a Java program to check whether a substring is present in a string.

Code Implementation:

```
import java.util.Scanner;  
  
public class SubStringCheck{  
    public static void main(String[] args) {  
        Scanner obj = new Scanner(System.in);  
  
        System.out.println("main string:");  
        String mainString = obj.nextLine();  
  
        System.out.println("substring");  
        String subString = obj.nextLine();  
  
        if (mainString.contains(subString)) {  
            System.out.println("Substring "" + subString + "" is present in main string.");  
        } else {  
            System.out.println("Substring "" + subString + "" is not present in main  
string.");  
        }  
    }  
}
```

Output

```
javac SubStringCheck.java  
ridwan@Rs50:/media/ridwan/Programming/Problem-so  
java SubStringCheck  
main string:  
hello  
substring  
llo  
Substring 'llo' is present in main string.  
ridwan@Rs50:/media/ridwan/Programming/Problem-so
```

24. Write a program in C to find the frequency of characters.

Code Implementation:

```
#include <stdio.h>
#include <string.h>

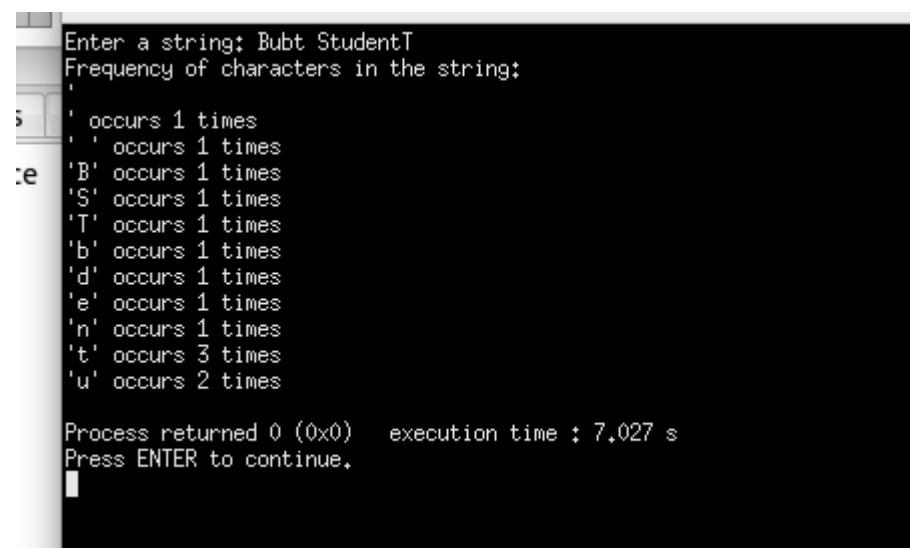
#define MAX_SIZE 100

int main() {
    char str[MAX_SIZE];
    int i, freq[256] = {0};

    printf("Enter a string: ");
    fgets(str, sizeof(str), stdin);
    for(i = 0; str[i] != '\0'; i++) {
        freq[str[i]]++;
    }
    for(i = 0; i < 256; i++) {
        if(freq[i] != 0) {
            printf("'%c' given %d times\n", i, freq[i]);
        }
    }

    return 0;
}
```

Output



```
Enter a string: Bubt StudentT
Frequency of characters in the string:
' ' occurs 1 times
'B' occurs 1 times
'S' occurs 1 times
'T' occurs 1 times
'b' occurs 1 times
'd' occurs 1 times
'e' occurs 1 times
'n' occurs 1 times
't' occurs 3 times
'u' occurs 2 times

Process returned 0 (0x0)   execution time : 7.027 s
Press ENTER to continue.
```