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Q-1) Write a program that takes an input paragraph of 10 lines. Count the total no. of words and total no. of characters (Excluding blank spaces)

Code :

```
package com.DSA;
import java.util.Scanner;
public class NumberOfWords {
    static Scanner in = new Scanner(System.in);
    public static void main(String[] args) {
        String str = in.nextLine();
        count(str);
    }
    static void count(String str){
        char[] ch = str.toCharArray();
        int letter = 0;
        int space = 0;
        int word = 1;
        for(int i = 0; i < str.length(); i++){
            if(Character.isLetter(ch[i])){
                letter ++ ;
            }
            if(Character.isSpaceChar(ch[i])){
                space ++ ;
                word ++;
            }
        }
        System.out.println("Number of letters are = " +
letter);
        System.out.println("Number of spaces are = " + space);
        System.out.println("Number of Words are = " + word);
    }
}
```

Output:

```
"C:\Program Files\Java\jdk-18\bin\java.exe" "-jav
hello world I'm Btech MNC student
Number of letters are = 27
Number of spaces are = 5
Number od Words are = 6

Process finished with exit code 0
```

```
"C:\Program Files\Java\jdk-18\bin\java.exe"
I'll see you soon
Number of letters are = 13
Number of spaces are = 3
Number od Words are = 4

Process finished with exit code 0
```

Q-2)Write a program to find the sum of all the elements of an array using pointer

Code:

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

int main()
{
  int array[] = {1,2,3,4};
  int *ptr;
  ptr = array;
  int sum = 0;
  int size = sizeof(array)/sizeof(array[0]);
  for (int i = 0; i < size; i++)
  {
    sum += *ptr;
    ptr++;
  }

  cout<<"Sum of an array = " <<sum;

  return 0;
}
```

Output :

```
[Done] exited with code=1 in 0.412 seconds

[Running] cd "e:\Coding\CollegeAssignments\MC124 Data St
Sum of an array = 10
[Done] exited with code=0 in 0.77 seconds
```

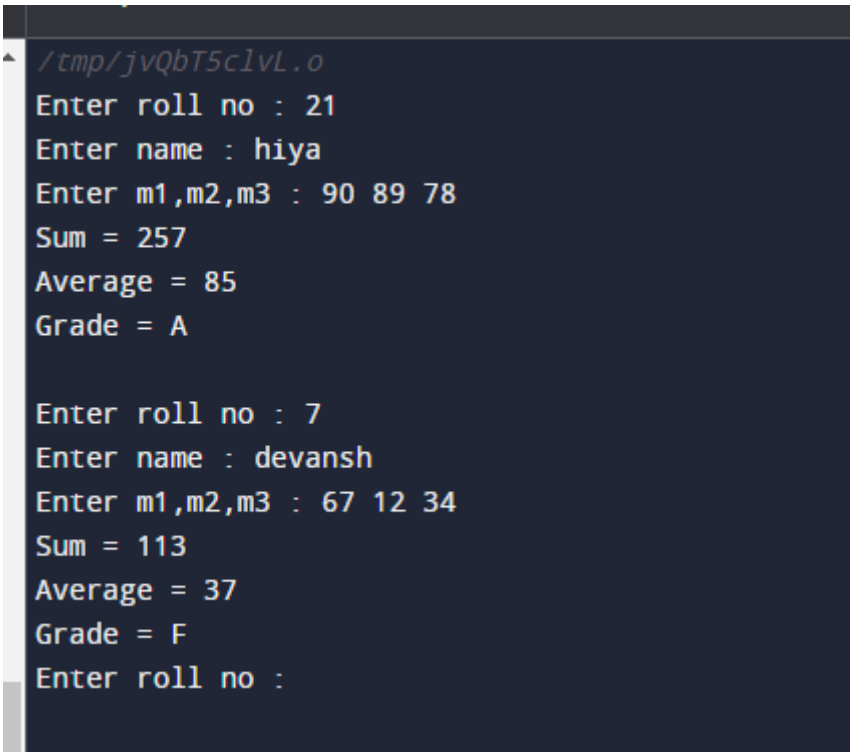
Q-3)Create a structure named student that has member variables roll no, name, m1, m2, m3, sum, average, and grade. Write a program to take user inputs for roll no, name, m1, m2, m3 and, then calculate sum, average and grade of each student. Marks Grade marks<50 F 50≤marks< 60 C 60≤marks<70 B 70≤marks<80 B+ 80≤marks<90 A 90≤mars≤ 100 A

Code:

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

struct Student
{
  int rollNo;
  string name;
  int m1;
  int m2;
  int m3;
  int sum;
  int average;
  string grade;
};

int main()
{
  struct Student Data;

  cout << "Enter roll no : ";
  cin >> Data.rollNo;

  while (Data.rollNo != 0)
  {
    cout << "Enter name : ";
    cin >> Data.name;

    cout << "Enter m1,m2,m3 : ";
    cin >> Data.m1 >> Data.m2 >> Data.m3;

    Data.sum = Data.m1 + Data.m2 + Data.m3;
    cout << "Sum = " << Data.sum << endl;

    Data.average = (Data.m1 + Data.m2 + Data.m3) / 3;
    cout << "Average = " << Data.average << endl;

    if (Data.average < 50)
    {
```

```
      cout << "Grade = F" << endl;
    }
    else if (51 < Data.average && Data.average < 60)
    {
      cout << "Grade = C\n" << endl;
    }
    else if (61 < Data.average && Data.average < 70)
    {
      cout << "Grade = B\n" << endl;
    }
    else if (71 < Data.average && Data.average < 80)
    {
      cout << "Grade = B+\n" << endl;
    }
    else if (81 < Data.average && Data.average < 90)
    {
      cout << "Grade = A\n" << endl;
    }
    else
    {
      cout << "Grade = A+\n" << endl;
    }
    cout << "Enter roll no : ";
    cin >> Data.rollNo;
  }

  return 0;
}
```

Output :



Q-4)Define a structure “complex” to read two complex numbers and perform addition, subtraction of these two complex numbers and display the result

Code:

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

typedef struct
{
  float real;
  float imaginary;
} complex;

int main()
{
  complex num1, num2, sum;

  cout << "Enter real and imaginary part of 1st complex number :\n";
  cin >> num1.real >> num1.imaginary;

  cout << "Enter real and imaginary part of 2nd complex number:\n";
  cin >> num2.real >> num2.imaginary;
```

```
  sum.real = num1.real + num2.real;
  sum.imaginary = num1.imaginary + num2.imaginary;

  cout<<"SUM = "<<sum.real <<" + i"<< sum.imaginary<<endl;

  sum.real = num1.real - num2.real;
  sum.imaginary = num1.imaginary - num2.imaginary;

  cout<<"Subtraction = "<<sum.real <<" + i"<< sum.imaginary;

  return 0;
}
```

```
/tmp/lrITyVyFz5.o
Enter real and imaginary part of 1st complex number :
10 9
Enter real and imaginary part of 2nd complex number:
-9 -6
SUM = 1 + i3
Subtraction = 19 + i15
```

```
/tmp/lrITyVyFz5.o
Enter real and imaginary part of 1st complex number :
5 3
Enter real and imaginary part of 2nd complex number:
2 1
SUM = 7 + i4
Subtraction = 3 + i2
```