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MODULE 1 - Program 1.1

Aim: write a C program, to find the Area and Perimeter of a Rectangle.

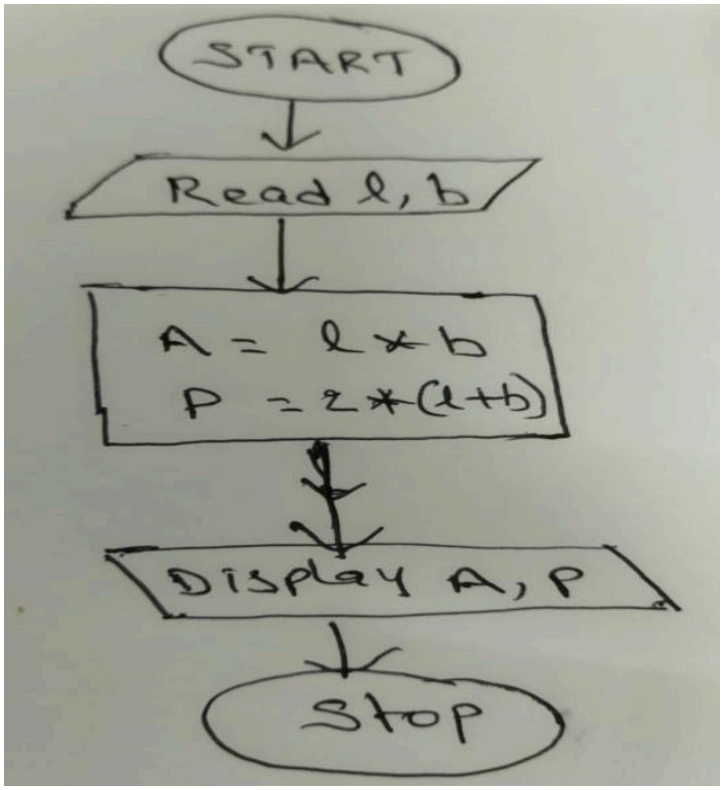
Formula: let ‘l’ represents “Length” ,
‘b’ represents “Breadth”
‘A’ represents “Area”
‘P’ represents “Perimeter”

A = l * b
P = 2*(l+b)

Algorithm:

Step 1: start
Step 2: read l,b
Step 3: calculate A=l*b
P=2*(l+b)
Step 4: display A, P
Step 5: stop

Flowchart:



Program 1.1:

```c
#include <stdio.h>

int main()
{
    int l,b,A,P;

    printf("Enter the Length and Breadth of Rectangle : ");
    scanf("%d %d",&l,&b);
    A=l*b;
    P=2*(l+b);
    printf("\nArea = %d",A);
    printf("\nPerimeter = %d",P);
    return 0;
}
```

Output:

```
Enter the Length and Breadth of Rectangle : 10 5

Area = 50
Perimeter = 30
```

MODULE 1 - Program 1.2

Aim: Write a C Program to find the area and circumference of circle.

Formula: Area = $A = \pi r^2$ $A = \pi r^2$

Circumference = C $= 2\pi r = 2\pi r$

Algorithm:

Step 1: Start

Step 2: Read the radius as r

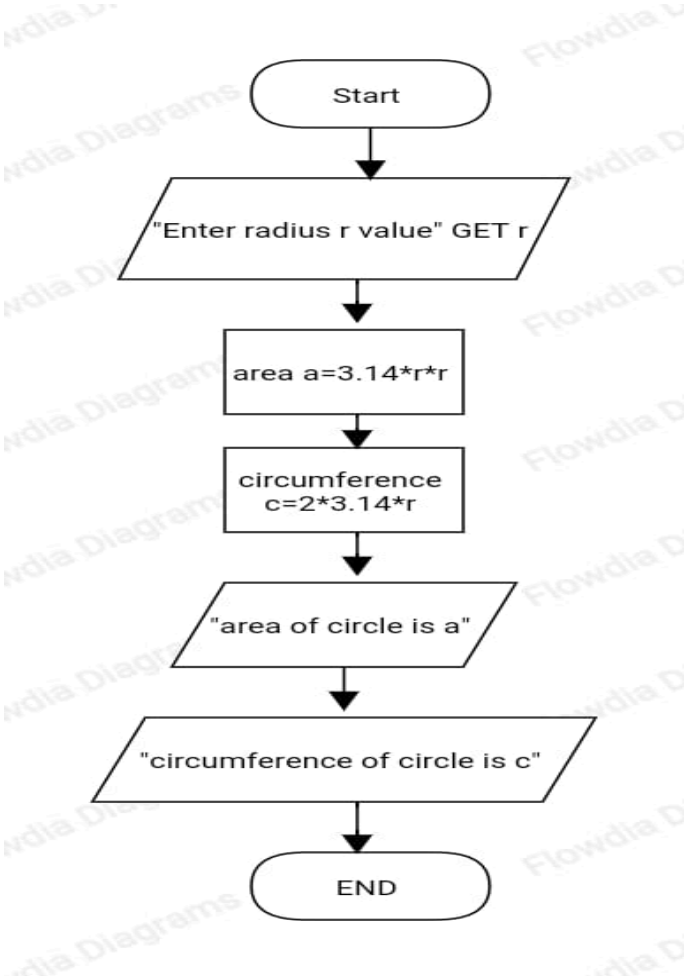
Step 3: Calculate A = $\pi * r * r$ $\pi * r * r$

C = $2 * \pi * r$ $2 * \pi * r$

Step 4: Display "Area = ", A and "Circumference = ", C

Step 5: Stop

Flowchart:


Start
"Enter radius r value" GET r
area a=3.14*r*r
circumference
c=2*3.14*r
"area of circle is a"
"circumference of circle is c"
END

Program:

```c
#include<stdio.h>
 #include<conio.h>
 #define pi 3.14
 void main()
 {
  int r;
  float a,c;
  printf("\n enter radius of a circle \t");
  scanf("%d",&r);
  a=pi*r*r;
  c=2*pi*r;
  printf("\n area = %.2f",a);
  printf("\n circumfrence = %.2f",c);
  }
```

Output:

```
enter radius of a circle       5

area = 78.50
circumfrence = 31.40
```

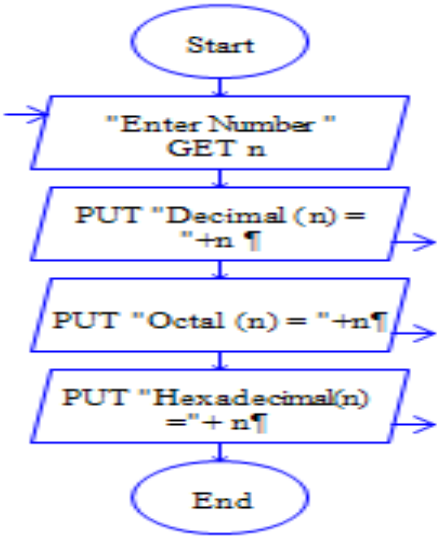
MODULE 1 - Program 1.3

PROGRAM 1

Aim: Write a C Program to display given number in different number systems.

Algorithm: Step 1: start
Step 2: read an integer (n)
Step 3: display decimal (n)
Step 4: display octal (n)
Step 5: display hexa-decimal(n)
Step 6: stop

Flowchart:



Program:

```c
#include<stdio.h>
void main()
 {
  int n;
  printf("\n enter the number \t");
  scanf("%i",&n);
  printf("\n decimal = %d",n);
  printf("\n octal = %o",n);
  printf("\n hexadecimal = %x",n);
}
```

Output:

```
enter the number        20

decimal = 20
octal = 24
hexadecimal = 14
```

MODULE 1 - Program 1.4

PROGRAM 1

Aim: The program should get the branding expenses, travel expenses, food expenses and logistics expenses as input from the user and calculate the total expenses for an event and the percentage rate of each of these expenses.

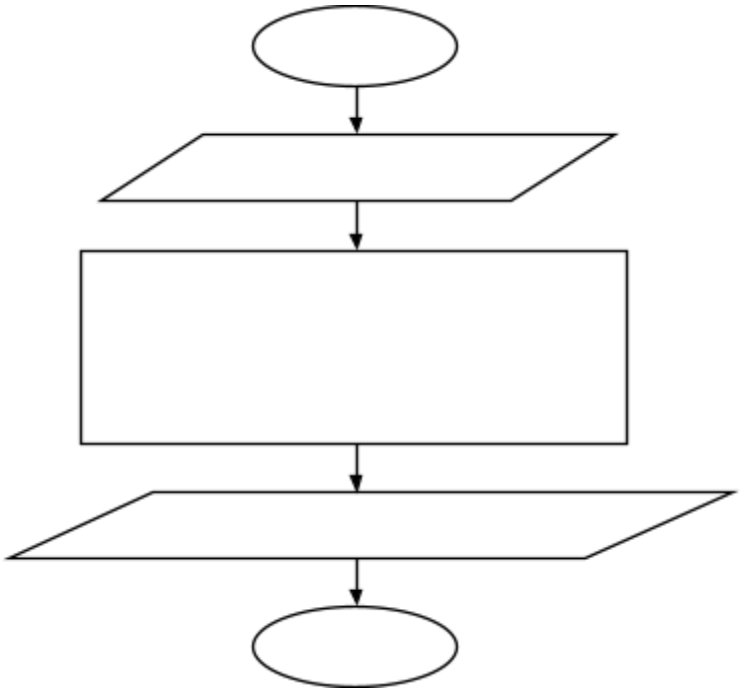
Formula: total=BE+TE+FE+LE;
BEP=(BE/total)*100;
TEP=(TE/total)*100;
FEP=(FE/total)*100;
LEP=(LE/total)*100;

Where BE = branding expenses , TE = travel expenses, FE = food expenses, LE= logistics expenses and BEP, TEP,FEP,LEP are percentages of branding expenses, travel expenses, food expenses and logistics expenses respectively. total is the Total Expenses.

Algorithm :

Step 1 : start
Step 2 : read BE,TE,FE,LE
Step 3 : Calculate
total=BE+TE+FE+LE;
BEP=(BE/total)*100;
TEP=(TE/total)*100;
FEP=(FE/total)*100;
LEP=(LE/total)*100;
Step 4 : display total, BEP, TEP, FEP, LEP
Step 5 : stop

Flowchart:



Program:

```c
#include<stdio.h>
#include<math.h>
int main()
{
    double BE,TE,FE,LE,total,BEP,TEP,FEP,LEP;
    printf("\nEnter branding expenses : ");
    scanf("%lf",&BE);
    printf("\nEnter travel expenses : ");
    scanf("%lf",&TE);
    printf("\nEnter food expenses : ");
    scanf("%lf",&FE);
    printf("\nEnter logistics expenses : ");
    scanf("%lf",&LE);
    total=BE+TE+FE+LE;
    BEP=(BE/total)*100;
    TEP=(TE/total)*100;
    FEP=(FE/total)*100;
    LEP=(LE/total)*100;
    printf("\nTotal expenses : Rs.%.2lf",total);
    printf("\nBranding expenses percentage : %.2lf%%",BEP);
    printf("\nTravel expenses percentage : %.2lf%%",TEP);
    printf("\nFood expenses percentage : %.2lf%%",FEP);
    printf("\nLogistics expenses percentage : %.2lf%%",LEP);
    return 0;
}
```

Output:

```
Enter branding expenses : 20000

Enter travel expenses : 40000

Enter food expenses : 15000

Enter logistics expenses : 25000

Total expenses : Rs.100000.00
Branding expenses percentage : 20.00%
Travel expenses percentage : 40.00%
Food expenses percentage : 15.00%
Logistics expenses percentage : 25.00%
```

Aim: write a C program to perform arithmetic operations.

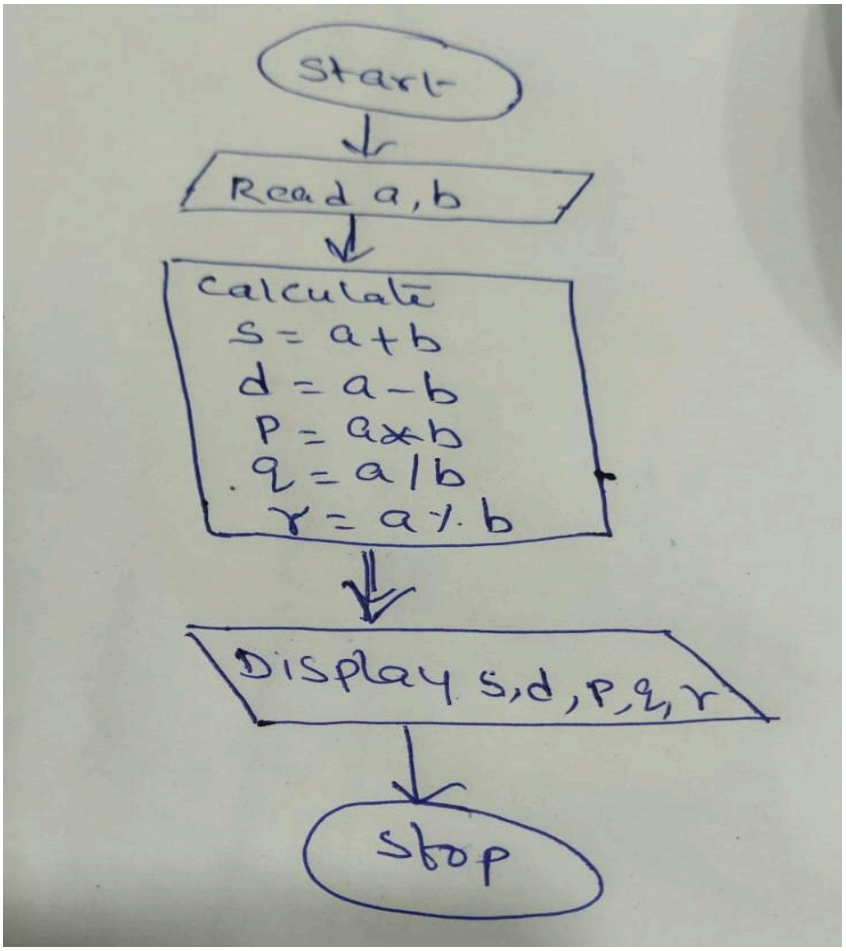
Formula: a and b are any two given integers

Sum= a+b, Difference = a-b , Product = a*b , Quotient = a/b , remainder = a%b

Algorithm:

Step 1: start
Step 2: read a, b
Step-3: calculate s=a+b , d=a-b, p=a*b, q=a/b, r=a%b
Step-4: display s,d,p,q,r
Step-5: stop

Flowchart:



Program :

```c
#include<stdio.h>
 #include<conio.h>
 void main()
 {
  int a,b;
  printf("\n enter any two numbers \t");
  scanf("%d %d",&a,&b);
  printf("\n sum = %d",a+b);
  printf("\n difference = %d",a-b);
  printf("\n product = %d",a*b);
  printf("\n quotient = %d",a/b);
  printf("\n remainder = %d",a%b);
}
```

Output:

```
enter any two numbers  5 3

sum = 8
difference = 2
product = 15
quotient = 1
remainder = 2
```

Aim: Write a C Program to find the area of a triangle.

Formula: Area of triangle = $A = \sqrt{(s * (s-a) * (s-b) * (s-c))}$

$A = \sqrt{(s * (s-a) * (s-b) * (s-c))}$

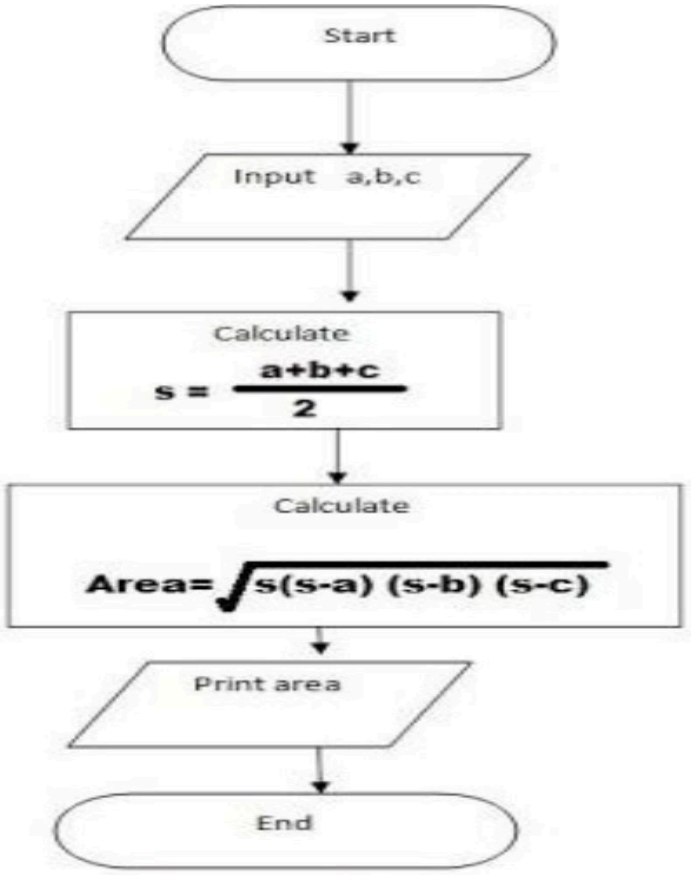
where a, b, c are sides of a triangle. And s $= (a+b+c)/2$

$= (a+b+c)/2$

Algorithm:

Step 1: Start
Step 2: Read a, b, c
Step 3: Calculate S = (a+b+c)/2
A = sqrt(s*(s-a)*(s-b)*(s-c))
Step 4: Display A
Step 5 : Stop

Flowchart:



Program:

```
#include<stdio.h>
#include<math.h>
 void main()
 {
  int a,b,c;
  float area,s;
  printf("\n enter sides of a triangle\t");
  scanf("%d %d %d",&a,&b,&c);
  s=(a+b+c)/2.0;
  area=sqrt(s*(s-a)*(s-b)*(s-c));
  printf("\n area = %.2f",area);
}
```

Output:

```
enter sides of a triangle      3 4 5

area = 6.00
```

MODULE 1 - Program 1.7

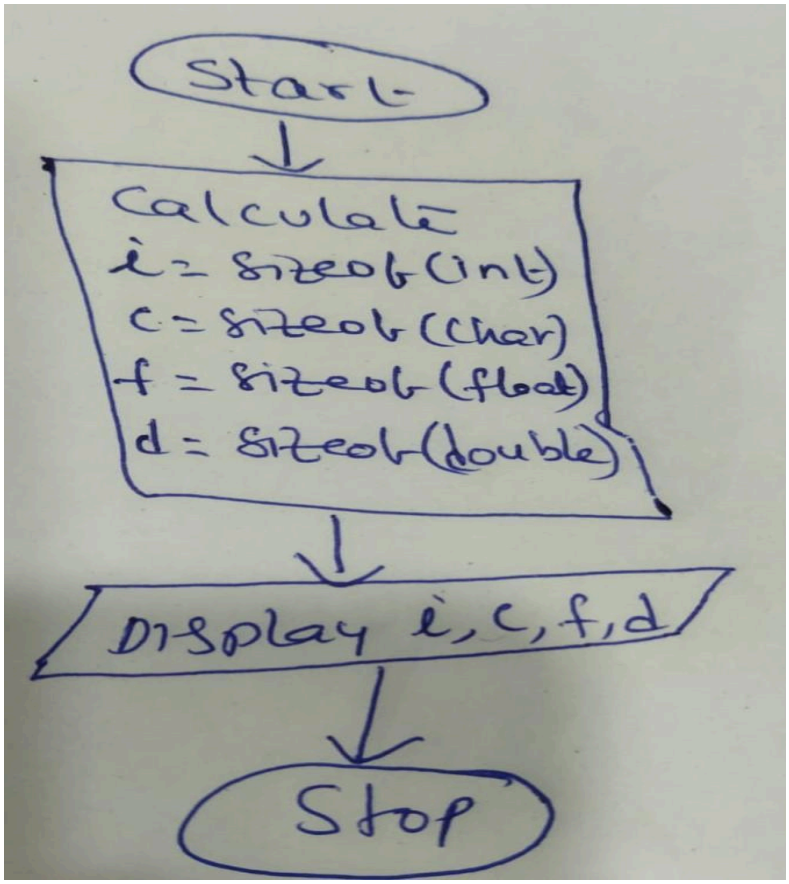
PROGRAM 1

Aim: Write a C Program to print the size of Basic Data types. i.e., char , int, float, double.

Algorithm:

Step 1: start
Step 2 : display sizeof(char)
Step 3 : display sizeof(int)
Step 4 : display sizeof(float)
Step 5 : display sizeof(double)
Step 6 : stop

Flowchart:



Program:

```c
#include<stdio.h>
 void main()
 {
  printf("\n size of char = %ld",sizeof(char));
  printf("\n size of int = %ld ",sizeof(int));
  printf("\n size of float = %ld ",sizeof(float));
  printf("\n size of double = %ld ",sizeof(double));
 return 0;
 }
```

Output:

```
size of char = 1
size of int = 4
size of float = 4
size of double = 8
```

MODULE 1 - Program 1.8

Aim: Write a C Program to Calculate sum of first n natural numbers, first n odd numbers, first n even numbers

Formula:

Sum of First n naural numbers = n*(n+1)/2
Sum of First n odd numbers = n^2
Sum of First n even numbers = n * (n+1)

Algorithm:

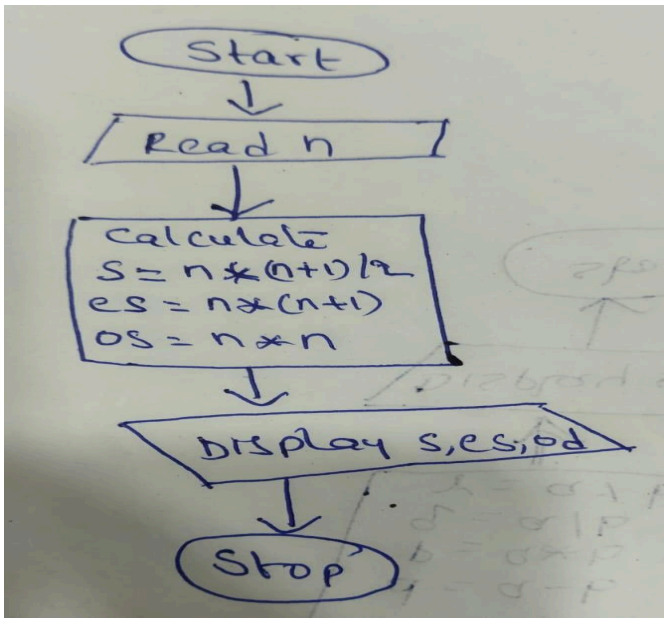
Step 1 : Start
Step 2 : Read n
Step 3 : Calculate s = $n * (n + 1)/2\, n * (n + 1)/2$

$$es = n * (n + 1\, n * (n + 1)$$

$$os = n * n\, n * n$$

Step 4 : Display s, es,od
Step 5 : Stop

Flowchart:



Program:

```c
#include <stdio.h>
int main() {
    int n,evensum,oddsum,sum;
    printf(" Enter the n value : ");
    scanf("%d", &n);
    sum=n*(n+1)/2;
    evensum=n*(n+1);
    oddsum=n*n;
    printf("\nSum of frist %d natural numbers = %d",n,sum);
    printf("\nSum of frist %d even numbers = %d",n,evensum);
    printf("\nSum of frist %d odd numbers = %d",n,oddsum);
    return 0;
}
```

Output:

```
 Enter the n value : 5

Sum of frist 5 natural numbers = 15
Sum of frist 5 even numbers = 30
Sum of frist 5 odd numbers = 25
```

MODULE 1 - Program 1.9

Aim: Write a C program to calculate the volume of a sphere. You are given radius as the double value represents the radius of the sphere. Calculate the volume of a sphere and store the result in the double variable volume.

Note: - For consistency in the output, use π = 3.14 .

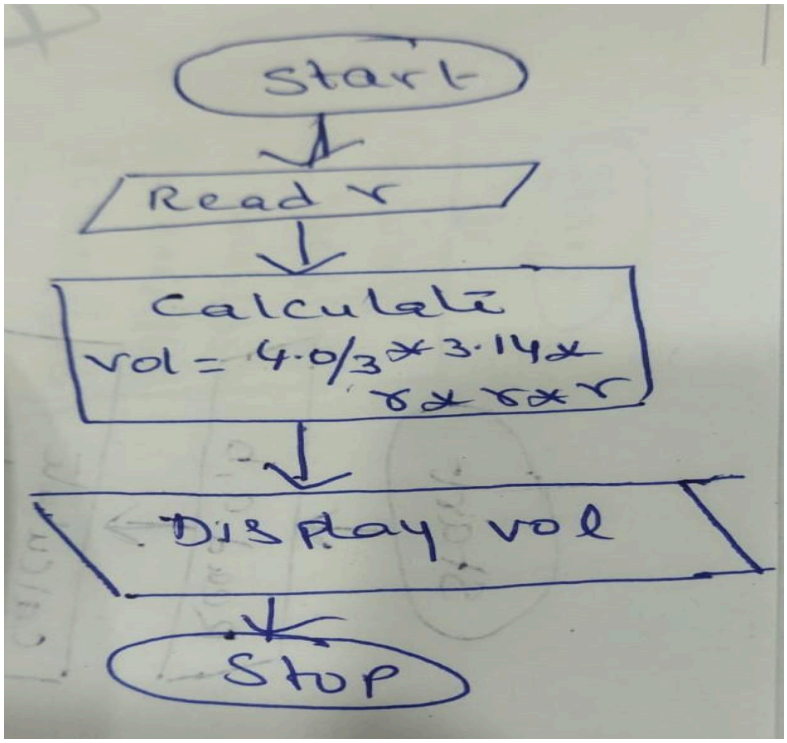
Formula:

$$volume = \frac{4}{3} * \pi * radious^3$$

Algorithm:

Step 1 : Start
Step 2 : Read radius
Step 3 : Calculate vol = $\frac{4.0}{3} * 3.14 * radius * radius * radius$
$\frac{4.0}{3} * 3.14 * radius * radius * radius$
Step 4 : Display vol
Step 5 : Stop

FLOWCHART:



Program:

```c
#include <stdio.h>
int main() {
    double radius;
    printf(" Enter the radius of sphere : ");
    scanf("%lf", &radius);
    double volume = 4.0/3.0*3.14*radius*radius*radius;
    printf("Volume of sphere = %.2lf", volume);
    return 0;
}
```

Output:

```
 Enter the radius of sphere : 5
Volume of sphere = 523.33
```

MODULE 1 - Program 1.10

Aim: Write a C program to Find the nth term of the arithmetic sequence, when the first term a and common difference d and number of terms n are given to you.

Formula:

Use the following formula to find the nth term.

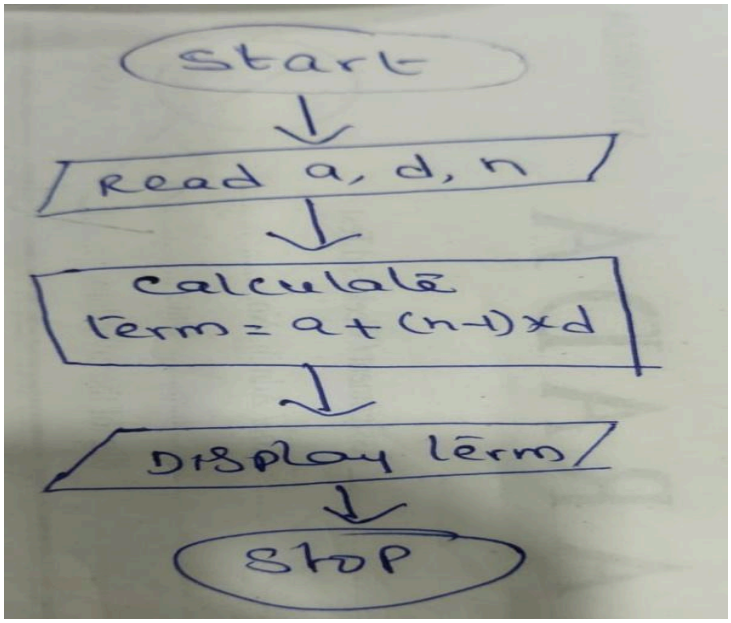
$an = a + (n - 1)d$,

Where a, corresponds to the first term in the series.
d, corresponds to the common difference.
n, corresponds to the number of terms.

Algorithm:

Step 1 : Start
Step 2 : Read a,d,n
Step 3 : Calculate term = a+(n-1)*d
Step 4 : Display term
Step 5 : Stop

Flowchart:



Program:

```c
#include <stdio.h>
#include<stdlib.h>

int main()
{
    int a,d,n,term;
    printf("Enter the first term : ");
    scanf("%d",&a);
    printf("Enter the common difference : ");
    scanf("%d",&d);
    printf("Enter the number of terms : ");
    scanf("%d",&n);
    term=a+(n-1)*d;
    printf("nth term of series = %d",term);


    return 0;
}
```

Output:

```
Enter the first term : 3
Enter the common difference : 6
Enter the number of terms : 25
nth term of series = 147
```