**Experiment 2**

**Aim**

Describe the different type of constant and variables in ‘C’.

**Theory**

**Variables**

Variables are memory location in computer’s memory to store data. To indicate the memory location, each variable should be given a unique name called identifier. Variable names are just the symbolic representation of a memory location.

Examples of variable name: `sum`, `car no.`, `count` etc.

In C, variables can be classified as:

- Numeric variables
  Numeric variables can either be of the type integer (int) or of the type real (float). Integer (int) values are whole numbers (like 10 or -10). Real (float) values can have a decimal point in them. (Like 1.23 or -20.123).
- Character variables
  Character variables are letters of the alphabet, ASCII characters or numbers 0-9. If you declare a character variable you must always put the character between single quotes (like so ‘A’). So remember a number without single quotes is not the same as a character with single quotes.

**Constants**

Constants are the terms that can’t be changed during the execution of a program. For example: 1, 2.5, "Programming is easy.” etc.

In C, constants can be classified as:

- Integer constants
  Integer constants are the numeric constants (constant associated with number) without any fractional part or exponential part. There are three types of integer constants in C language: Decimal constant (base 10), octal constant (base 8) and hexadecimal constant (base 16).
Program

#include<stdio.h>
#include<conio.h>

int main()
{
    int n,i;
    float x,sum,avg;
    sum=0.00;
    printf("\n Enter the number of data \n");
    scanf("%d",&n);
    printf("\n enter the data\n");
    for(i=1;i<=n;i++)
    {
        scanf("%f",&x);
        sum=sum+x;
    }
    avg=sum/n;
    printf("\n Sum of %d numbers = %f",n,sum);
    printf("\n Average of %d numbers = %f",n,avg);
    getch();
    return 0;
}

Output

Enter the number of data
4
Enter the data
2
5
8
11

Sum of 4 numbers = 26.000000
Average of 4 numbers = 6.500000
Aim
To write a program in C language for finding sum of series of function $\sin(x)$ up to 5th term.

Flowchart
} else
{
    for(i=1;i<n;i+=2)
    {
        if(i%3==0)
        {
            s=s+2*fx[i];
        }
        else
        {
            s=s+3*fx[i];
        }
    }
    s=(3.0/8.0)*h*s;
    printf("\n The value of integration by 3/8 rule=%f",s);
}
getch();
return 0;
}
Program

#include<stdio.h>
#include<conio.h>
int main()
{
    int n=0;
    float k1,k2,k3,k4,x,y,S,h;
    float f(float x,float y);
    printf("Enter the initial approximation of x and y \n");
    scanf("%f %f",&x,&y);
    printf("\n");
    h=0.2;
    do
    {
        S=0;
        k1=h*f(x,y);
        k2=h*f(x+(h/2),y+(k1/2));
        k3=h*f(x+(h/2),y+(k2/2));
        k4=h*f(x+h,y+k3);
        S=k1+(2*k2)+(2*k3)+k4;
        S=S/6;
        printf("k1=%f t k2=%f t k3=%f t k4=%f \n",k1,k2,k3,k4);
        x=x+h;
        y=y+S;
        printf("x=%f t y=%f \n\n",x,y);
        n++;
    }while(n<5);
    printf("\n The approximate solution of the equation dy/dx=x+y is %f\n",y);
    return 0;
}
float f(float x,float y)
{
    return(x+y);
}
Program

#include<stdio.h>
#include<conio.h>

int main()
{
    int n,k;
    float x,y,temp,f1,f2,S,h;
    float f(float x,float y);
    printf("Enter initial amount of radioactive substance and final value of time(Sec) \n");
    scanf("%f %f",&y,&x);
    printf("\n");
    h=25;
    k=x/h;
    x=0;
    n=0;
    printf("time=%f \n Radioactive substance=%f \n",x,y);
    do
    {
        S=0;
        f1=f(x,y);
        temp=f1+f1;
        f2=f(x+h,temp);
        S=f1+f2;
        S=S*h/2;
        y=y+S;
        x=x+h;
        printf("time=%0.2f \n Radioactive substance=%f \n",x,y);
        n++;
    }while(n<k);
    printf("\n The final amount of radioactive material after time %0.2f sec is %f \n",x,y);
    return 0;
}