Practical - 1

Aim: Programs to understand the basic datatype and I/O.

Program 1:

```
#include <stdio.h>
#include <conio.h>
void main ()
{
        char name [50];
        char add [50];
        int roll_no;
        float percent;
        char grade;
        char mob[10];
        clrscr();
        Printf (" ****Demonstration of various
                                datatypes ****");
        Printf (" \n Name of the student: ");
        gets (name);
        printf (" \n Address of the student: ");
        scanf (" %s ", &add);
        printf (" \n Roll no. of the student: ");
        scanf (" %d ", &roll no);
        Printf (" \n Percentage of student: ");
        scanf (" % + ", &percent);
        printf (" \n Grade of student: ");
        scanf (" %s ", &Grade);
```

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Output:

```
***** Demonstration of various datatypes *****

Name of the student: Adarsh
Address of the student : Mumbai
Roll no. of student: 1777
Percentage of the student: 85%
Grade of the student: A
Mobile no. of the student: 9876543210

student name: Adarsh
Student address: Mumbai
student roll_no : 1777
Student Percent: 85%
student Grade: A
Student mobile_no: 9876543210
```

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```
printf("\n Mobile no. : ");
scanf("%10s", &mob);
printf("\n student name: %s", name);
printf("\n student address : %s", add);
printf("\n student roll_no: %d", roll_no);
printf("\n student percent: %f", percent);
printf("\n student grade: %c", grade);
printf("\n student mobile_no : %10s", mob);
getch();
}
```

Program 2

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int side, area;
    clrscr();
    printf("Enter the side \n");
    scanf("%d", &side);
    area = side * side;
    printf("\n Area of square %d", area);
    getch();
}
```

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Output:

Enter the side: 7

Area of square: 49

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Practical - 2

Q.1 Write a C Program which will show the use of various different types of operators

Arithmetic operators

Source Code:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int num1, num2, add, sub, Mul, div;
    clrscr();
    printf("Enter 1st number: ");
    scanf("%d", &num1);
    printf("Enter 2nd number:");
    scanf("%d", &num2);
    add = num1+num2;
    Printf("Addition of 2 numbers : %d \n",
            add);
    sub = num1 - num2;
    Printf("Subtraction of 2 numbers: %d \n",
            sub);
    Mul = num1 * num2;
    Printf("Multiplication of 2 numbers: %d \n",
            Mul);
    div = num1 / num2;
    Printf("Division of 2 numbers: %d", div);
    getch();
}
```

Output:

Enter 1st number: 8
Enter 2nd number: 2
Addition of 2 number: 10
Subtraction of 2 numbers: 6
Multiplication of 2 numbers: 16
Division of 2 numbers: 4

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Logical operators

```
#include <stdio.h>
#include <conio.h>
void main ()
{
    int x, y, z, value 1, value 2, value 3, value 4, value5;
    clrscr();
    printf("Enter 1st value :");
    scanf("%d", &x);
    printf("Enter 2nd value:");
    scanf("%d", &y);
    printf("Enter 3rd value:");
    scanf("%d", &z);
    value 1 = (x<y) && (z>y);
    printf("value 1 is: %d \n", value 1);
    value 2 = (x=y) && (z<y);
    printf("value 2 is : %d \n", value 2);
    value 3 = (x<y) || (z=y);
    printf("value 3 is : %d \n", value 3);
    value 4 = ! (x==y);
    printf("value 4 is : %d \n", value 4);
    value 5 = (x==y);
    printf("value 5 is : %d \n", value 5);
    getch();
}
```

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Output:

Enter 1st value : 9
Enter 2nd value : 8
Enter 3rd value : 2

Value 1 is : 0
Value 2 is : 1
Value 3 is : 1
Value 4 is : 0
Value 5 is : 1

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Ternary Operator

```
# include <stdio.h>
# include <conio.h>
void main()
{
    int a=100, b=20, c=50, big;
    clrscr();
    big= a>b && a>c ? a:b;
    Printf("The biggest number is : %d", big);
    getch();
}
```

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Output:

The biggest number is 100.

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Practical 3

Aim: Programs on Decision statement.

1) Write a program to find odd and Even number.

Algorithm:

step 1: Start
step 2: [Take Input] Read a number from user
step 3: Check if number % 2 == 0 then print "Even number" else print "Odd Number".
step 4: Exit.

Program:

```
#include <stdio.h>
# include <conio.h>
void main()
{
    int n;
    clrscr();
    Printf("Enter a number: ");
    scanf("%d", &n);
    if (n%2 == 0)
    {
        Print("Even number");
    }
    else
    {
        Print("odd Number");
    }
```

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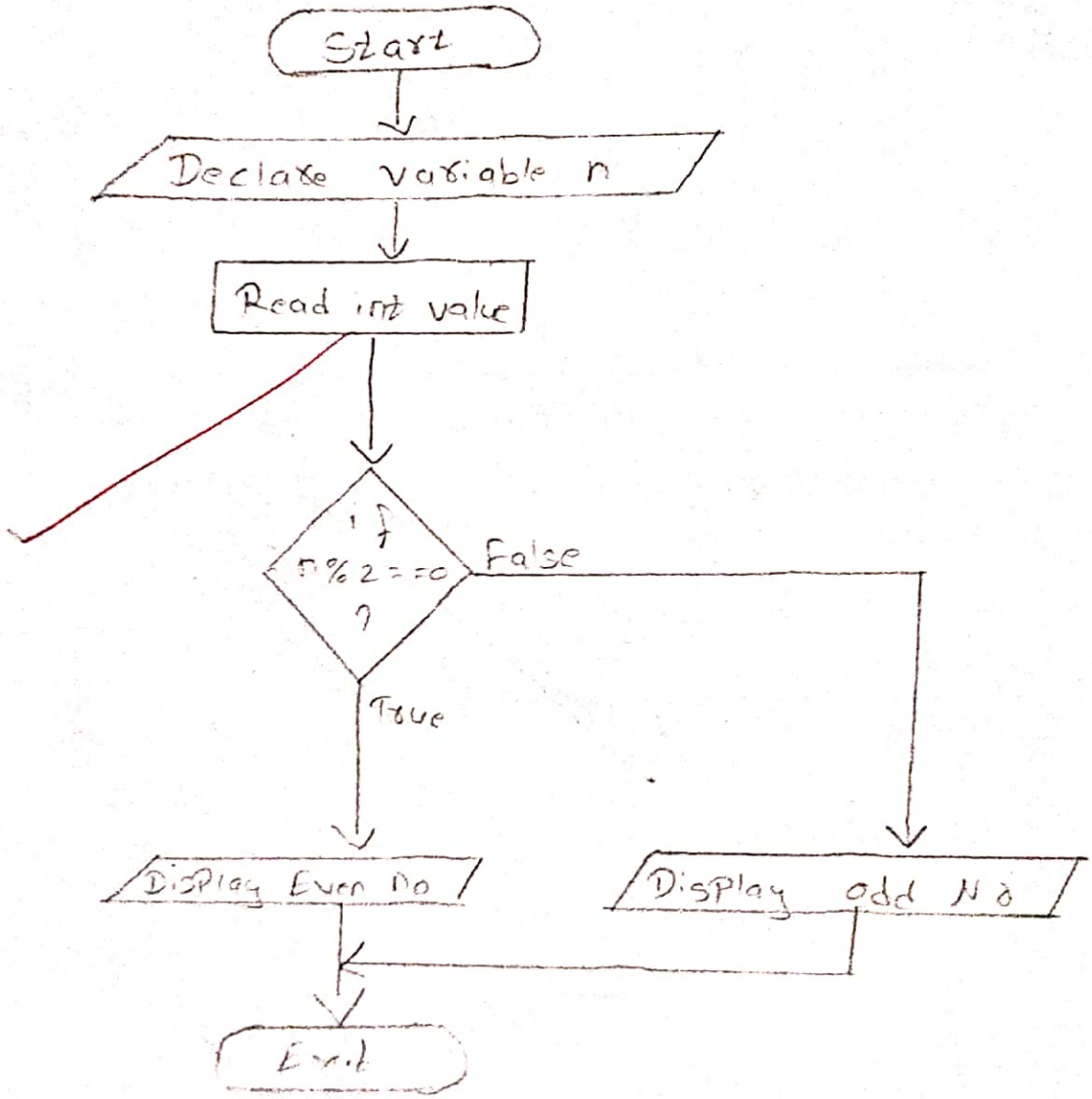
OutPut:

Enter a Number: 2,6

Even number

Flowchart:



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```
}    getch();
```

2] Write a Program to find the entered year is leap year or not.

Algorithm:

step 1: Start
step 2: [Take input] Read year from user
step 3: if year % 4=0 and year % 400 == 0 OR
year % 4 = 0 and year % 100 != 0
Print "Leap year"
else Print " Not a Leap year ".
step 4: Exit.

Program:

```
# include <stdio.h>
# include <conio.h>
Void main()
{
    int year;
    clrscr();
    Printf ("Enter a year:");
    scanf ("%d", &year);
    if (year % 4) == 0)
    {
        if (year % 100 == 0)
        {
```

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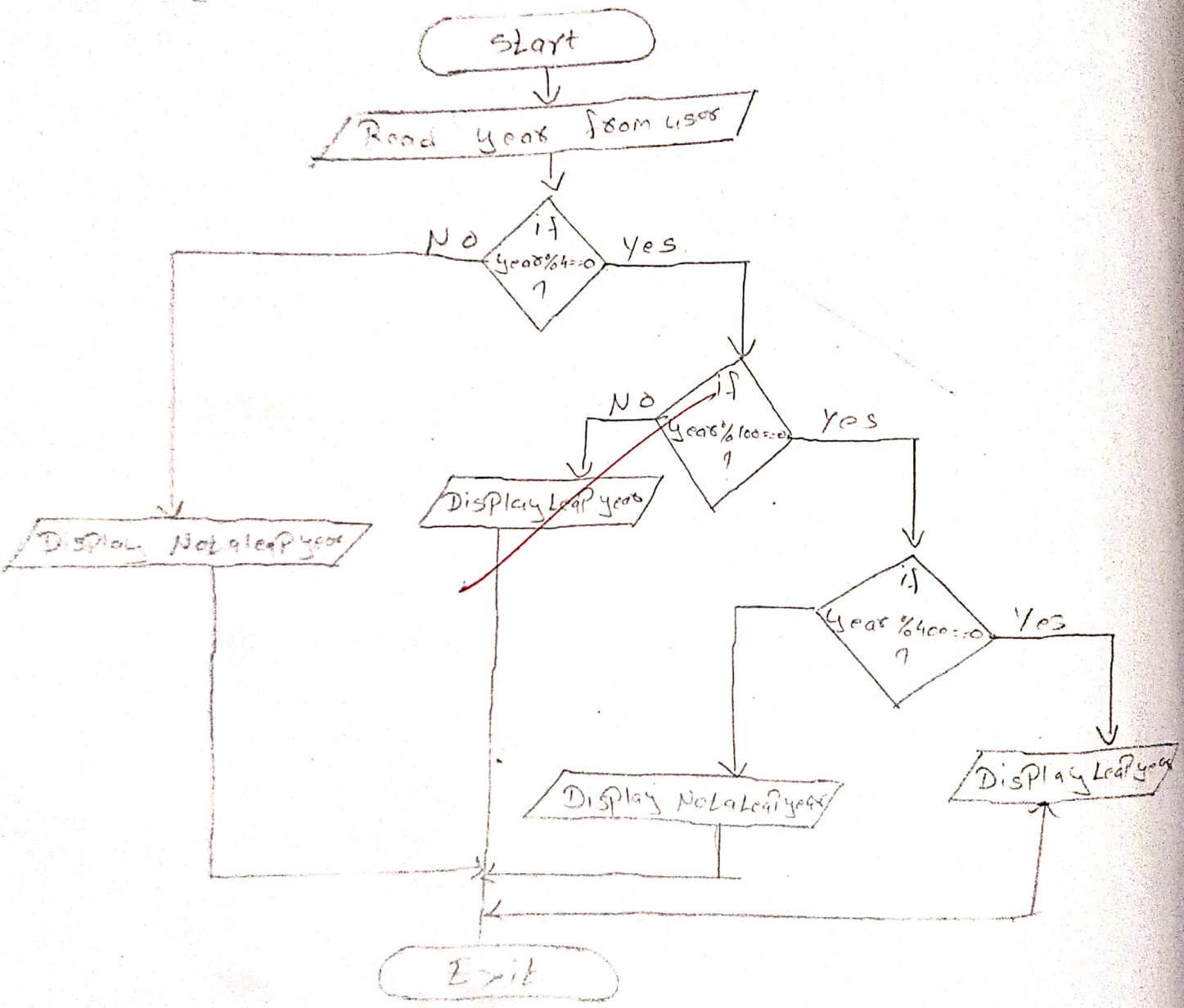
Output :

Enter a year : 2017
Not a Leap year.

Flowchart :



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```
                if (year % 400 = 0)
                {
                        printf("Leap year");
                }
                else
                {
                        printf("Not a Leap year");
                }
        } }
        else
        {
                printf("Leap year");
        }
} }
else
{
        printf("Not a leap year");
}
getch();
}
```

3] Write a Program to find whether the entered character is vowel or constant.

Algorithm:

step 1: Start
step 2: [Take input] Read character value from user

step 3 [check] if value == "a" || value == "e" || value == "i" ||
value == "o" || value == "u" ||
value == "A" || value == "E" ||
value == "I" || value == "O" ||
value == "U"
Print " vowel".
else Print " constant".

step 4: Exit.

Program:

```
#include <iostream.h>
#include <conio.h>
void main()
{
    char a;
    clrscr();
    Printf("Enter the Alphabet:");
    Scanf("%s", &a);
    if (a=="a" || a==="e" || a==="i" || a==="o" || a==="u"||
        a=="A" || a==="E" || a==="I" || a==="O" || a==="U")
    {
        Printf("vowel");
    }
    else
    {
        Printf(" consonant");
    }
    getch();
}
```

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Evenodd.c

Practical 4

Aim: Write a program to print even number between 1-50 using while loop.

Source code:

```
# include <stdio.h>
# include <conio.h>
void main ()
{
    int i, n=50;
    clrscr();
    printf (" All even numbers from 1 to 50 are: \n",i)
    i = 2;
    while (i<=n)
    {
        printf (" %d \n", i);
        i = i+2;
    }
    getch();
}
```

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Output:

All even numbers from 1 to 50 are:

2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
42
44
46
48
50

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Algorithm:

step 1: Start.

Step 2: Initialize two variables with static variable where n = 50 and i = 2.

step 3: Use while loop for printing the even number upto the range 50.

step 4: Adding 2 to current even number will give next even number.

Step 5: Display the appropriate output.

step 6: stop.

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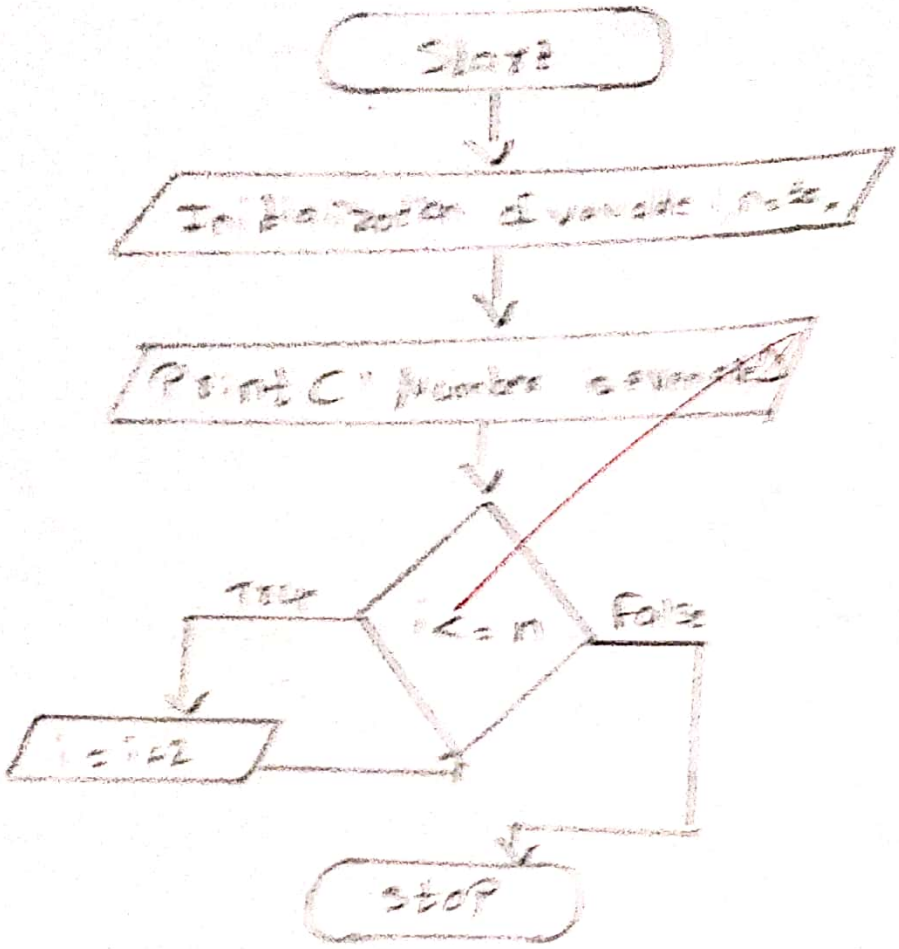
* Flowchart.


Start
Initialization of variable n=2,
Print "C" Number series
True
i<=n
False
i=i+2
Stop

B) Aim: Write a C Program to Print odd number between 1-50 using do while loop

Algorithm:

Step 1: Start

Step 2: Initialize two static variable n=50, i=1.

Step 3: Use do while loop for iter asks from 1 to 50.

Step 4: Use if condition statement to check whether given no. is even or odd.

Step 5: Increment the value of i by 1.

Step 6: Display the appropriate output.

Step 7: Stop.

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Output:

Odd no. from 1 to 50 are.

1
3
5
7
9
11
13
15
17
19
21
23
25
27
29
31
33
35
37
39
41
43
45
47
49

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Doubt odd.c

Source Code:

```
# include <stdio.h>
# include <conio.h>
Void main()
{
    int i, n=50;
    clrscr();
    Printf ("odd number from 1 to 50
            are: \n", n)
    i =+i
    do
    {
        if (i%2 ==1)
        {
            printf ("%d \n", i);
        }
        i++;
    }
    while (i<=n);
    getch();
}
```

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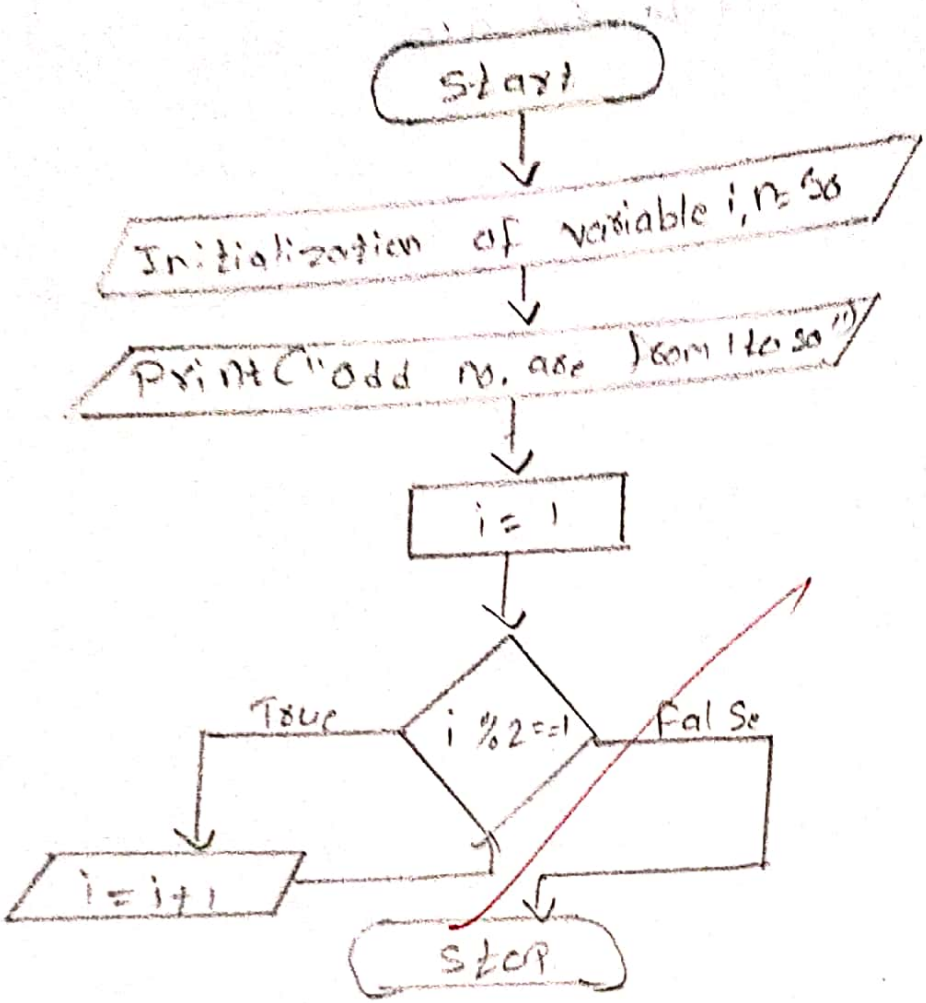

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18 EvenloOP.c

c) Write a c program to Print sum of all even number 1 to n using for loop.

Algorithm:

Step1: start

Step2: Initialize three variable and one is dynamic i=2, sum=0, i;

Step3: Use for loop for check the given range.

Step 4: Add current ~~Et~~ even number.

Step 5: Display the appropriate.

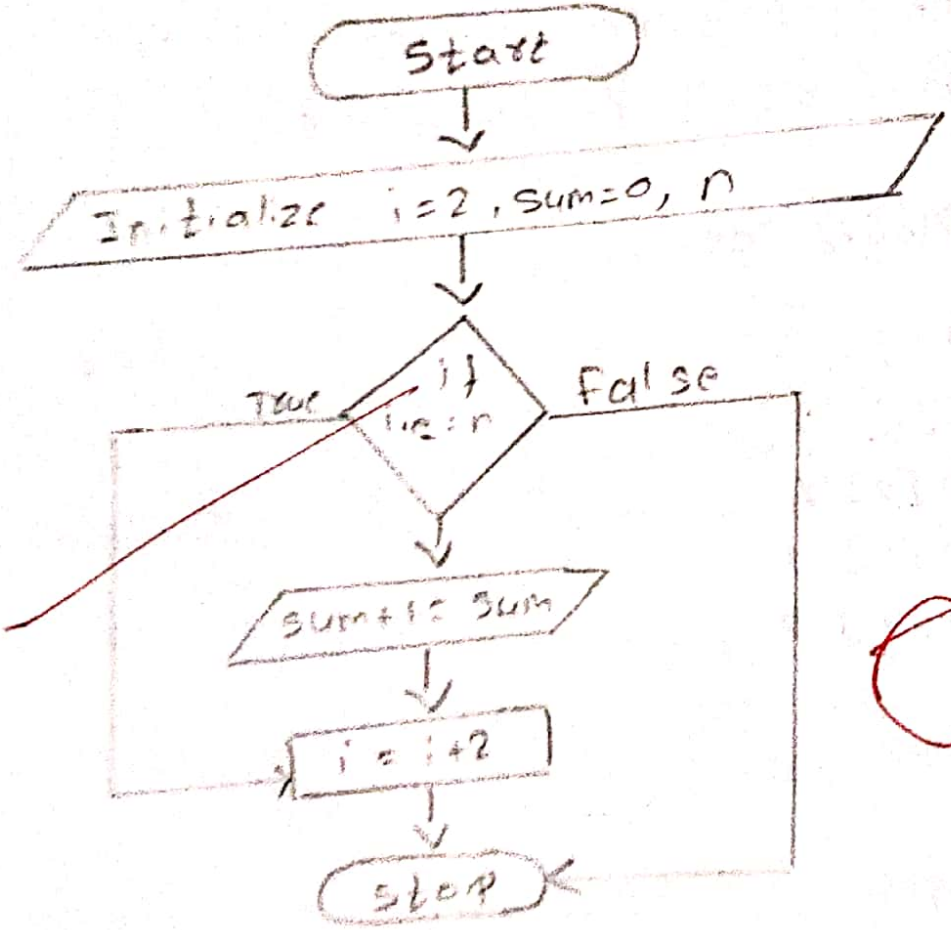
Source code:

```
# include <stdio.h>
# include <conio.h>
void main()
{
    int i,n, sum=0;
    clrscr();
    Printf ("Enter the range");
    scanf("%d", &n);
    for (i=2; i<=n; i=i+2)
    {
        sum = sum+i;
    }
    Printf("sum of all even no upto range %d", sum);
    getch();
}
```

Output:

Enter the range 10
Sum of all even numbers upto the range are 30.

Flowchart:



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Practical 5

Aim: Write a program to print the input array elements.

Source code:

```
#include <stdio.h>
#include <conio.h>
void main ()
{
        int a [20];
        int size, i;
        clrscr();
        printf("Enter number less than 20:");
        scanf("%d", &size);
        for (i=0; i<size; i++)
        {
            Printf("Enter number less than 20:");
            scanf("%d", &size);
        }
        Printf("\n the displayed array \n:");
        for (i=0; i<size; i++)
        {
            Printf("Entere a[%d] %d", i);
        }
        getch();
}
```

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Output

Enter the number less than 20: 5

Enter the a[0] no. elements 35

Enter the a[1] no element 2

Enter the a[2] no element 4

Enter the a[3] no element 1

Enter the a[4] no. element 8

The displayed array:

Enter a[0] 5

Enter a[1] 2

Enter a[2] 4

Enter a[3] 1

Enter a[4] 8

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Algorithm:

Step 1: Start

Step 2: Declare an array of user specified size.

Step 3: Initialize two variables of integer type i.e. size and i

Step 4: Take range from the user that to be printed which should be less than the specified size of an array.

Step 5: Use Nested for conditional loop for printing the elements in arrays according to its indexing.

Step 6: Print the appropriate output.

Step 7: Stop.

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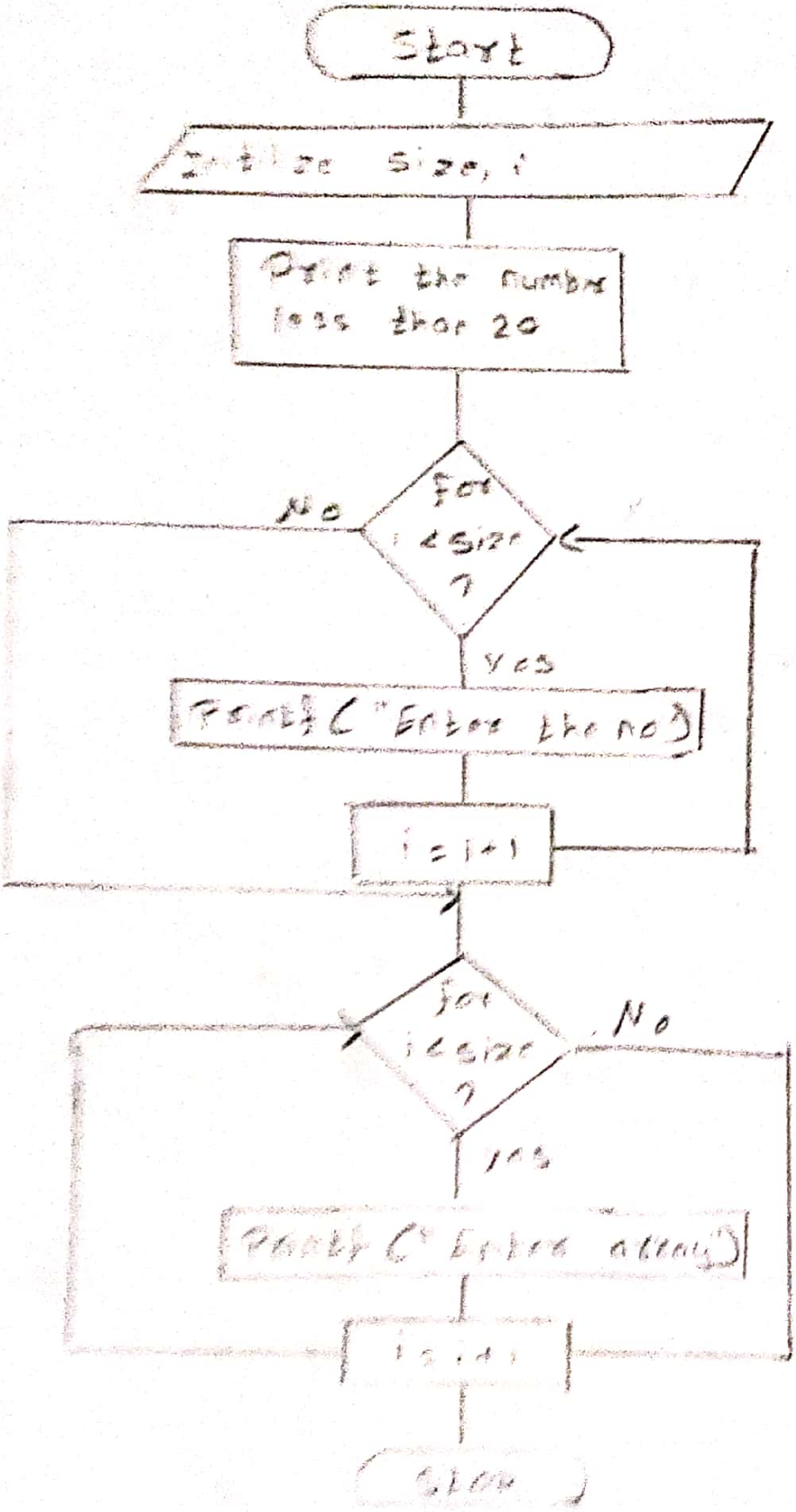

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6. Write a C Program to find out fibonacci series using array.

Source code:

```
#include <stdio.h>
#include <conio.h>
void main ()
{
        int a[20], n, i;
        clrscr();
        Printf("Enter the no. of terms \n");
        scanf("%d", &n);
         a[0] = 0;
         a[1] = 1;
        for (i=2; i<n; i++)
        {
            a[i] = a[i-2] + a[i-1];
        }
        Printf("The fibonacci series upto %d
                term is \n", n);
        for (i=0; i<n; i++)
        {
            printf("%d \t", a[i]);
        }
        getch();
```

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Output

Enter the no. of terms 5

The fibonacci series upto 5 term is

0 1 1 2 3

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Algorithm

step 1: start

step 2: Declare an array of integer type of specified size by the user.

step 3: Initialize two variables of dynamic variable i.e. i, n

step 4: Take the no. of terms from the user up to what the no. should be printed.

step 5: Initialize indexing value of a[0] = 0 and a[1] = 1 for printing fibonacci series

step 6: Using for condition loop for looping of number

step 7: Indexing value of present array is equal to previous indexing value and previous indexing value.

step 8: Print the fibonacci series upto the term given by the user.

step 9: Use for loop for printing the output in tabular form.

step 10: Stop.

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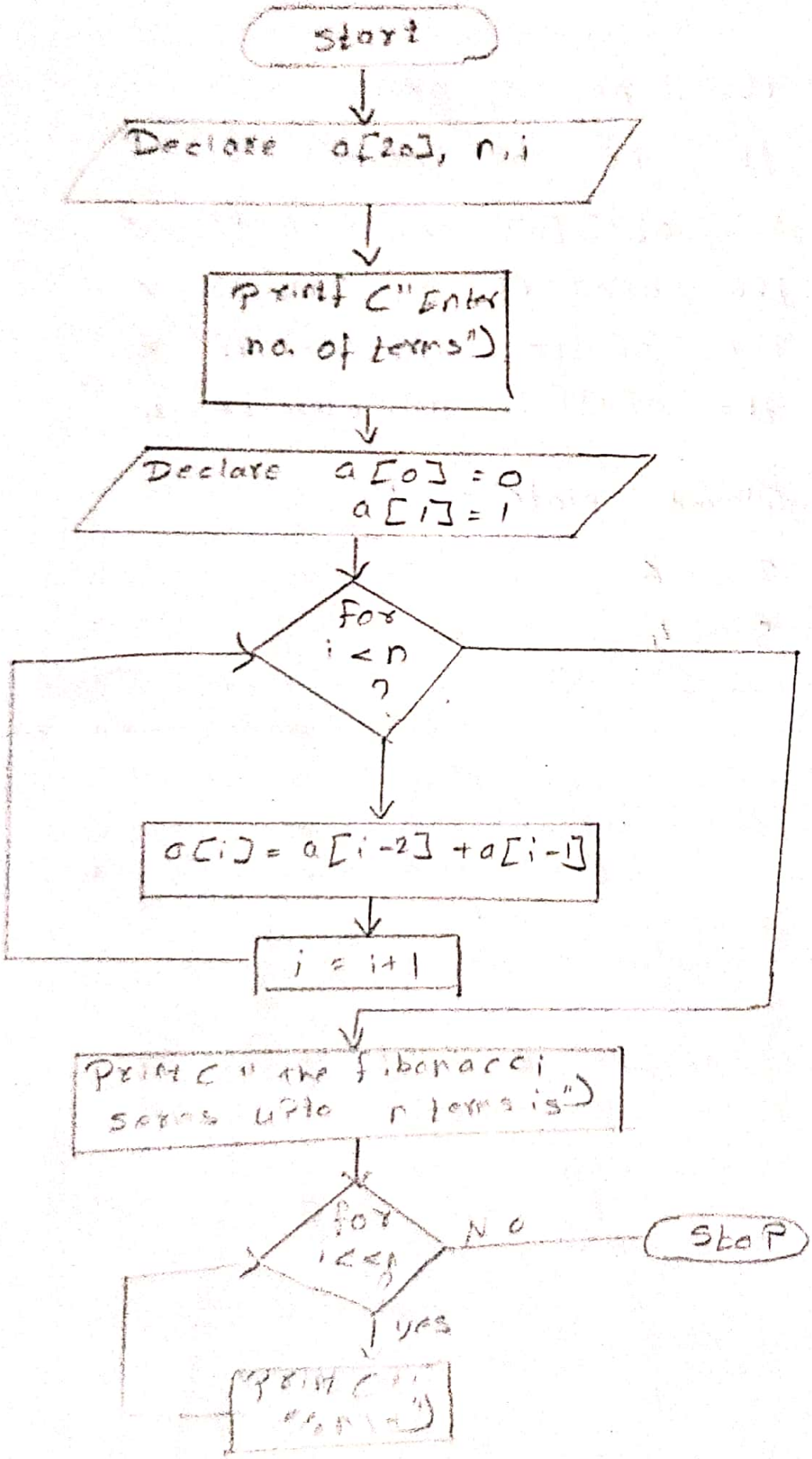

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3. Aim: Write a program to represent a multidimensional array in matrix input.

Source code:

```
#include <stdio.h>
#include <conio.h>
void main()
{
    int a[20][20];
    int row, col, i, j;
    clrscr();
    printf("Enter no. of rows:");
    scanf("%d", &row);
    printf("Enter no. of columns");
    scanf("%d", &col);
    for (i=0; i< row; i++)
    {
        for (j=0; j< col; j++)
        {
            printf("Enter the a[%d][%d] no. element:", i, j);
            scanf("%d", &a[i][j]);
        }
    }
    printf("The displayed matrix is \n \n");
    for (i=0; i< row; i++)
    {
```

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Output:

Enter the no. of rows 2
Enter the no. of columns 2
Enter the a[0][0] no. element 2
Enter the a[0][1] no. element 6
Enter the a[1][0] no. element 8
Enter the a[1][1] no. element 4

The displayed matrix is

2 6
8 4

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```
        for(j<0; j<col; j++)
        {
          printf(" \t %d", a[i][j]);
        }
        printf("\n");
      }
      getch();
    }
```

Algorithm:

Step 1: Start

Step 2: Declare multi-dimensional array and row, column, i and j.

Step 3: Display the Enter no. of row

Step 4: scan the same

Step 5: Use for conditional for accessing the array elements.

Step 6: Use another for loop for displaying the array values

Step 7: stop.

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Practical No: 6

Aim: Programs on Function

1) Write a program to find factorial of a number using recursion function.

Algorithm:

step 1: Start
step 2: Define a function which will calculate the factorial of given number.
step 3: Define main function and accept the number from the user. Also define another variable of integer datatype.
step 4: Call the function declared above main function to calculate factorial and print the value.
step 5: Now define the body of function which calculate factorial.
step 6: Use the if conditional statement and calculate the value accordingly.
step 7: Return the value to the user.
step 8: Stop.

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Output

Enter a Number :
4

Factorial of 4 is :
120

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Source Code:

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

int factorial(int n);
void main()
{
    int num, fact;
    clrscr();
    printf("\n Enter a number: \n");
    scanf("%d", &num);
    fact = factorial(num);
    printf("\n Factorial of %d is: %d", num, fact)
    getch();
}
int factorial (int n)
{
    int f;
    if (n==1)
    {
        return (1)
    }
    else
    {
        f = n * factorial(n-1);
    }
    return(f);
}
```

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Program to find sum of digits of entered numbers

Algorithm:

step1: start
step2: Define a function which will calculate the sum of digits.
step3: Take a number from user which contains atleast two digits.
step4: Call the function defined above main function. calculate sum of digits.
step5: Define the body of function defined above and accept define two integer variables
step6: Use the while loop and perform the calculations accordingly.
step7: Print the value of sum so calculated.
step8: stop

Source code:

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

void sum (int n)
void main ()
{
    int num;
    clrscr();
```

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Output:

Enter a number:

141

Sum of digits is:

6

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```
    printf("\n Enter a number : \n");
    scanf("%d", &num);
    sum(num);
    getch();
}
void sum(int n)
{
    int v, s=0;
    while(n>0)
    {
        v = n%10
        s = s+v
        n = n/10
    }
    Printf("\n sum of digits is : \n %d", s);
}
```