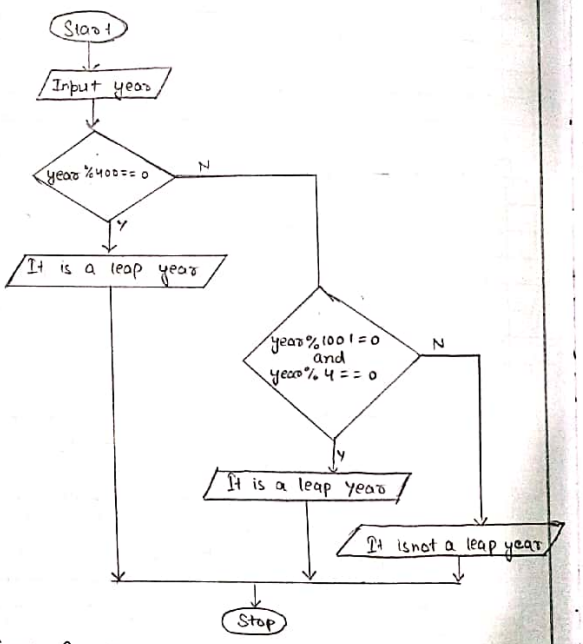


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## Experiment :- 1

**Objective :-** Write a program to check leap year or not a leap year.

**ALGORITHM :-**

Step1 → Take input year of int data-type.
Step2 → Check if the taken year is divisible by 400, then display "leap year".
Step3 → Check if the taken year is divisible by 4 but not by 100, then display "leap year".
Step-4 → Else, Display "Not leap year".

**PROGRAM :-**

```
#include <stdio.h>

int main(){
    int year;
    printf("Enter year to check");
    scanf("%d",&year);

    if(year%400==0){
        printf("%d is a leap year.",year);
    }

    elseif(year%100!=0)&&(year%4==0){
```

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Output

```
Enter year to check: 2024
2024 is a leap year.
```

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```
        printf("%d is a leap year.", year);
    }
    else {
        printf("%d is not a leap year.", year);
    }
    return 0;
}
```

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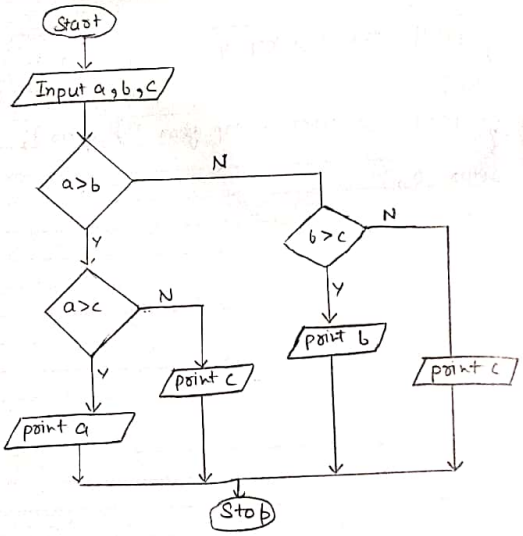


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## EXPERIMENT :- 2

**Objective :-** Write a program to find the largest number from three number using if-else or ternary operator.

**ALGORITHM :-**

Step 1 → Take three input from the user.

Step 2 → Check for a > b, then a ~~<~~ > c, if both condition is true, print "a" and second condition false, then print "c"

Step 3 → Again check b > c, ~~the then~~ if condition true we print "b"

Step 4 → Else, print "c".

**PROGRAM :-**

(using if-else.)

```
#include <stdio.h>
int main() {
    int a, b, c;
    printf("Enter a: ");
    scanf("%d", &a);

    printf("Enter b: ");
    scanf("%d", &b);

    printf("Enter c: ");
    scanf("%d", &c);
```

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Output:-

```
Enter a : 23
Enter b : 20
Enter c : 13
A(23) is max.
```

Output:-

```
Enter a : 20
Enter b : 13
Enter c : 40
40 is max.
```

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```
    if (a>b){
        if (a>c) {
            printf("A(%d) is max.", a);
        }else{
            printf("C(%d) is max.", c);
        }
    }
    else if (b>c){
        printf("B(%d) is max.", b);
    }
    else{
        printf("C(%d) is max.", c);
    }
    return 0;
}
```

→

```
#include <stdio.h>                    (Using ternary oper.)
int main(){
    int a, b, c;
    int max;

    printf("Enter a: ");
    scanf("%d", &a);
    printf("Enter b: ");
    scanf("%d", &b);
    printf("Enter c: ");
    scanf("%d", &c);
```

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```
    max = (a>b)?(a>c)?a:c:(b>c)?b:c;

    printf("%d is max.", max);
    return 0;
}
```

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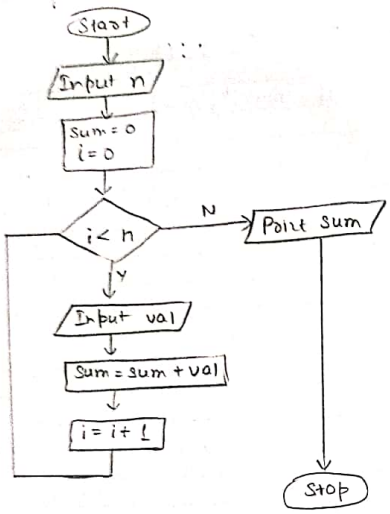


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## EXPERIMENT :- 3

OBJECTIVE :- Write a program to find of sum of n numbers that will input from user.

ALGORITHM :-

Step 1 - Input the value of n., and make sum = 0

Step 2 - Now, take loop from 0 to n :- in step-3 to step 5.

Step-3 ↳ Take input.

Step-4 ↳ Add. input to variable sum.

Step-5 ↳ Increament the loop value.

Step 6 - Print the sum.

PROGRAM :-

```
#include <stdio.h>

int main() {

    int n, a;
    int sum=0;
    printf("Enter the value of n : ");
    scanf("%d", &n);

    for(int i=0; i<n; i++) {
        printf("Enter the %d number : ", i);
```

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OUTPUT:-

```
Enter the value of n : 4

Enter the 1 number : 23
Enter the 2 numbers : 20
Enter the 3 number : 14
Enter the 4 numbers: 5

The Sum of 4 numbers is 62.
```

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```
        scanf("%d", &a);
        sum= sum + a;
    }
    printf("The sum of %d numbers is %d\n", n,
                                    sum);

    return 0;
}
```

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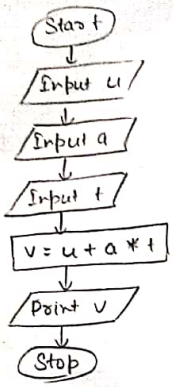


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## EXPERIMENT :- 4

OBJECTIVE :- Write a program to calculate the velocity after t time . With given of initial velo-city

ALGORITHM :-

Step 1 → Take inputs initial velocity (u) , acceleration (a) and time (t).

Step 2 → Now, calculate the velocity of after t time, with formula,

$$v = u + at.$$

Step 3 → Print the velocity.

PROGRAM :-

```
#include <stdio.h>

int main()
{
    int u, a, ~~t~~; float t, v;
    printf("Enter initial velocity : ");
    scanf("%d", &u);

    printf("Enter acceleration : ");
    scanf("%d", &a);
```

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OUTPUT →

Enter the initial velocity : 20
Enter the acceleration : 5
Enter time : 2.3

The velocity after 2.3 time is 31.5.

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```
printf("Enter time");
scanf("%f", &t);

v = u + (a * t)

printf("The velocity after %f time is %f",
        t, v);

return 0;
}
```

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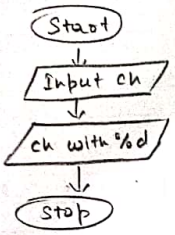


OUTPUT :

Enter the character : @

The ascii value of @ is 64.

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## EXPERIMENT :- 5

OBJECTIVE : Write a program in C to print ASCII value of the character.

ALGORITHM :

Step1 - Start

Step2 - Take the character value.

Step3 - Now, convert the character value to ascii with help of printf by print as no (%d).

Step4 -> Stop.

PROGRAM :-

```
#include <stdio.h>

int main()
{
    char ch;
    printf("Enter the character : ");
    scanf("%c", &ch);

    printf("\n The ascii valw of %c is %d .", ch, ch);

    return 0;
}
```

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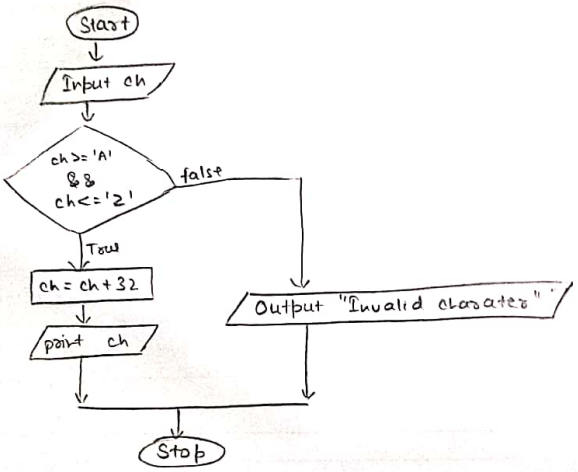


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## EXPERIMENT :- 6

OBJECTIVE : Write a program to convert upper case letter to lower case letter.

ALGORITHM :-

Step1 ⇒ Input the character
Step 2 → Check the character i.e. valid or not.
Step 3 → Add 32 to character value which will increase their ascii value makes lower case letters.
Step 4 → Return the lower letter.

PROGRAM :-

```
#include <stdio.h>

int main() {

    char ch;
    printf("Enter the Upper case letter : ");
    scanf("%c", &ch)

    if (ch >= "A" && ch <= "Z"){

        ch = ch + 32;
        printf(" lower case letter : %c ",ch);
    }
```

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OUTPUT:

Enter the upper case letter: A

Lower case letter: a.

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```
    else {
        printf("Invalid input.");
    }

    return 0;
}
```

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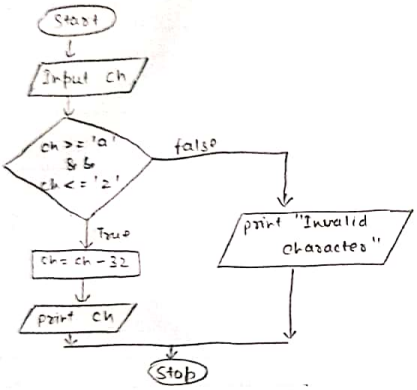


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## EXPERIMENT :- 7

OBJECTIVE :- Write a program in C language to convert lower letter to upper case letter.

ALGORITHM :-

Step 1- ~~first~~ firstly, take the input character.
Step 2 - Check for the condition for character if characters between a and z then step 3 run. else, go to step 5
Step 3- Subtract 32 from the character which will subtract from his ascii value. and save the result on a variable.
Step 4 - Print the variable and end the step
Step 5 - print invalid characters.

PROGRAM

```
#include <stdio.h>

int main() {
    char ch;
    printf("enter the lowercase character ");
    scanf("%c", &ch);

    if (ch>='a' && ch<='z'){

        ch= ch- 32;
```

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OUTPUT

Enter the lower case character : b.

Upper case : B.

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```
        printf("Upper case : %c ", ch);
    }
    else
    {
        printf("Invalid characters");
    }
    return 0;
}
```

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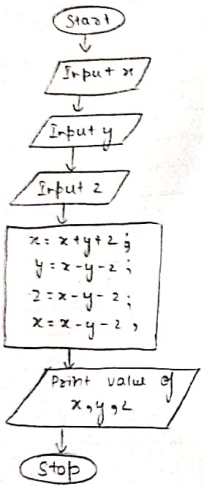


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## EXPERIMENT :- 8

OBJECTIVE: Write a progoam in C language to interscha-
-nge the three value in such a way that the value of y in x, the value of z in y and the value of x in z.

ALGORITHM :

Step1 - Input the value of x.
Step2 - Input the value of y
Step3 - Input the value of z.
Step4 - x = x + y + z ;
Step5 - y = x - y - z ;
Step6 - z = x - y - z ;
Step7 - x = x - y - z ,
Step8 - Point the value of x, y, z.

PROGRAM :-

```
#include <stdio.h>

int main() {
        int x,y,z;

        printf("Enter the value of x:");
        scanf("%d", &x);

        printf("Enter the value of y:");
```

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Output

```
Enter the value of x : 12
Enter the value of y : 15
Enter the value of z : 8

x is 8
y is 12
z is 15
```

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```
    scanf("%d",&y);
    printf("Enter the value of z : ");
    scanf("%d",&z);

    x = x + y + z;
    y = x - y - z;
    z = x - y - z;
    x = x - y - z;

    printf("\n x is %d\n", x);
    printf("\n y is %d\n", y);
    printf("\n z is %d\n", z);

    return 0;
}
```

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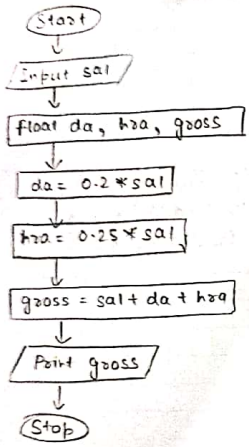


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## EXPERIMENT :- 9

**OBJECTIVE** :- Write a program in C to find the Gross Salary of person whose DA is 20% of basic salary and HRA is 25% of basic salary.

**ALGORITHM** :-

Step 1 -> Input the Basic Salary.
Step 2 -> Now, calculate Da by multiply 0.2 with basic salary.
Step 3 -> Similarly, calculate HRA by multiply 0.25 * with basic salary.
Step 4 -> Calculate the Gross salary by adding basic salary with da and HRA.
Step 5 -> Print the Gross salary.

**PROGRAM** :-

```
#include <stdio.h>

int main() {

    int sal;
    float da, hra, gross;

    printf("Enter the Basic Salary: ");
    scanf("%d", &sal);
```

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OUTPUT:-

Enter the Basic Salary : 200
Gross Salary : 290.000

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```
    da = 0.2 * sal;
    hra = 0.25 * sal;

    gross = sal + da + hra;

    printf("Gross Salary : %f ", gross);

    return 0;
}
```

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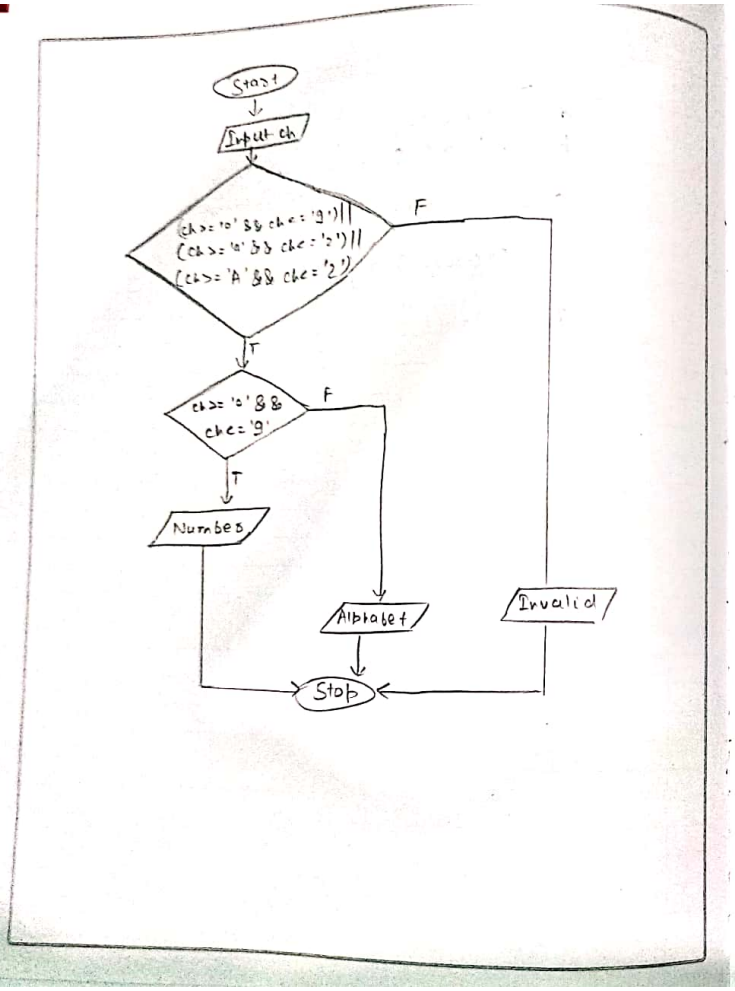


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## EXPERIMENT :- 10

**OBJECTIVE** :- Write a program in C to check ~~any alphabet~~ character is ~~for vowel and consonat~~ alphabet or numbers.

**ALGORITHM** :-

Step 1 - Start
Step 2 - Input the character.
Step 3 - firstly, we check it's valid or not by check that characters in between a & z or A & Z or 0 & 9.
Step 4 -> If it's valid, then check characters is in between 0 and 9, ~~that~~ then we print "Numbers".
Step 5 -> If it's valid and not a numbers, then it's alphabet so, print the result.
Step 6 -> Stop.

**PROGRAM:**

```
#include <stdio.h>

int main() {
    char ch;
    printf("Enter the characters: ");
    scanf("%c", &ch);
    if((ch>='a' && ch<='z')||(ch>='A' && ch<='Z'))
        printf("Given characters is alphabet");
```

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Output:

Enter the character : 9

The given character is number.

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```
    else if (ch >= '0' && ch <= '9') {
        printf("The Given character is number.");
    }
    else {
        printf("Invalid character");
    }

    return 0;
}
```

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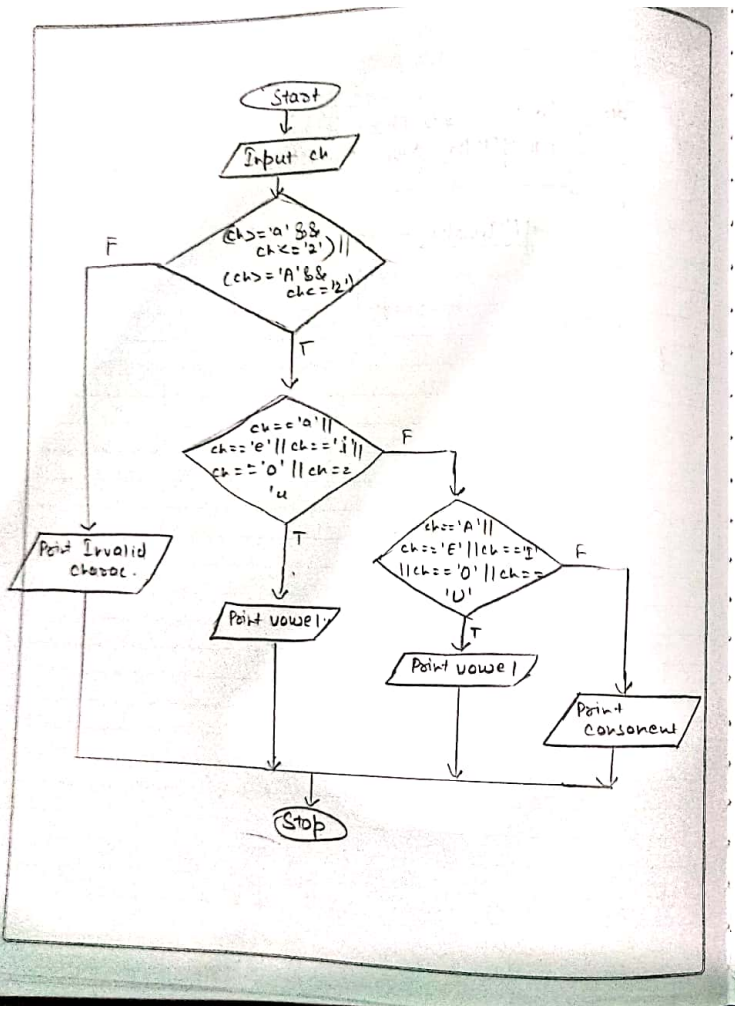


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## EXPERIMENT :- 11

**OBJECTIVE** - Write a program in C to check any alphabet for vowel and consonant.

**ALGORITHM** :-

Step1 -> Start.
Step2 -> Input the alphabet.
Step3 -> Firstly, we check that the given character is alphabet or not.
Step4 -> If it is alphabet, then we check it equal to a, e, i, o, u, then we print vowels
Step5 -> If it is alphabet, then check for A, E, I, O, U, then also print vowels else print consonants.
Step6 -> Stop.

**PROGRAM.**

```
#include <stdio.h>

int main() {
    char ch;
    printf("Enter the character");
    scanf("%c", &ch);

    if((ch>='a' && ch<='z') || (ch>='A' && ch<='Z'))
    {
        if(ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u')
            printf("Given character is vowel.");
```

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Output -

Enter the character : a

Given character is vowel.

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```
        else if (ch == 'A' || ch == 'E' || ch == 'I' ||
                 ch == 'O' || ch == 'U')
            printf("Given character is vowel.");
        else
            printf("Given character is consonent.");
    }
    else
    {
        printf("Invalid character");
    }

    return 0;
}
```

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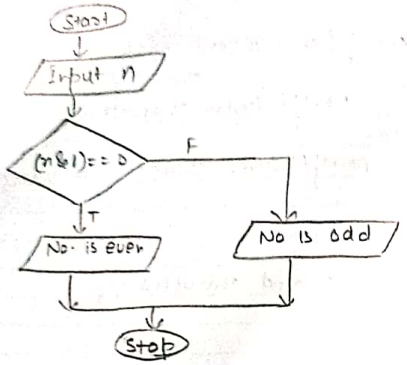


OUTPUT :-

Enter Number : 21
No. is odd.

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## EXPERIMENT-12

OBJECTIVE :- Write a program in C to check the number that is even or odd by using bit-wise operator.

ALGORITHM :

Step 1 -> Start
Step 2 -> Input the No.
Step 3 -> If last bit of No is 1 (help of &) then print even.
else odd.
Step 4 -> Stop.

PROGRAM

```
#include <stdio.h>

int main() {
    int n;
    printf("Enter Number");
    scanf("%d", &n);

    if((n&1)==0)
        printf("No is even");
    else
        printf("No is odd");

    return 0;
}
```

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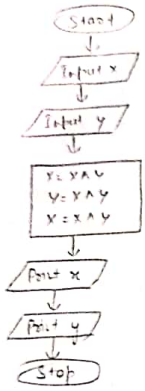


OUTPUT

Enter value of x and y respectively.
21
22

The value of x is 22 and y is 21.

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## EXPERIMENT - 13

OBJECTIVE : Write a program in C to swap two numbers using bitwise operators

ALGORITHM :

Step 1 → Start
Step 2 → Input value of x and y
Step 3 → Swap value of x and y using bitwise.
Step 4 → Print the value of x and y.
Step 5 → Stop

PROGRAM :

```
#include <stdio.h>

int main() {
    int x, y;
    printf("Enter value of x and y respectively");
    scanf("%d %d", x, y)

    x = x ^ y;
    y = x ^ y;
    x = x ^ y;

    printf("The value of x is %d and y is %d", x, y);

    return 0;
}
```

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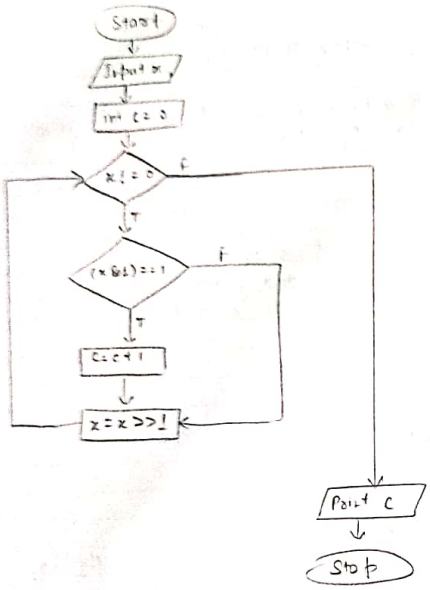


OUTPUT

Enter Number x 10
2

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## EXPERIMENT : 14

OBJECTIVE : Write a program in C to count number of set bits in a given number.

ALGORITHM :

Step 1 -> Start
Step 2 -> Input value of x and initialise variable c = 0.
Step 3 -> we will check (x & 1) == 1, then c = c + 1.
Step 4 -> Rightshift the value of by 1.
Step 5 -> If x != 0, then return to step - 3.
Step 6 -> Print the count 'c'.
Step 7 -> Stop

PROGRAM

```
#include <stdio.h>
int main() {
    int x, c = 0;
    printf("Enter Number x");
    scanf("%d", &x);

    while (x != 0) {
        if ((x & 1) == 1) {
            c = c + 1;
        }
        x = x >> 1
    }
    printf("%d", c);
    return 0;
}
```

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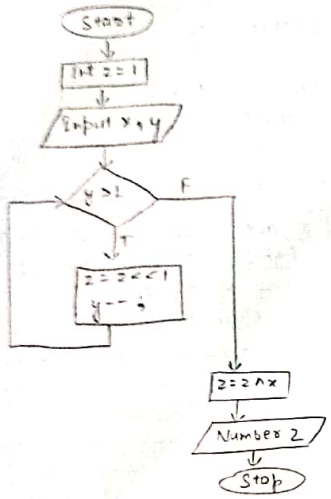


Output:

Enter no. x and position bit to set :
10
1
Number is 11.

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## EXPERIMENT :- 15

OBJECTIVE : Write a program in C to flipping the given position of bit of the number.

ALGORITHM :-

Step1 → Start
Step2 → Input No as x and position of changed bit as y.
Step3 → Initialise variable z = 1
Step4 → left shift of z with 1 and store in z.
Step5 → y--; then check y > 1, if true return step 4.
Step6 → z = z ^ x;
Step7 → Print output z and stop.

Program

```
#include<stdio.h>
void main() {
    int x, y, z = 1;
    printf("Enter no. x and position bit to set.");
    scanf("%d %d", &x, &y);

    while(y > 1) {
        z = z << 1;
        y--;
    }

    z = z ^ x;
    printf("Number is %d", z);
}
```

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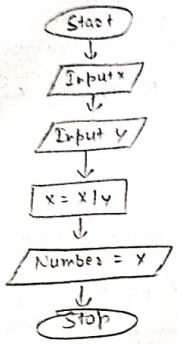


Output:-

Enter the value of x and y:
8
3
Number is 11.

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## EXPERIMENT: 16

OBJECTIVE:- Write a program in C to take num. as input and set the bit of first no. where second no. bit is set.

ALGORITHM:

Step1- Start.
Step2 -> Input the value of x.
Step3- Input the value of y.
Step4-> Using OR ~~(&)~~ , x|y and store in x.
Step5 Print the x.
Step6 -> Stop.

PROGRAM:-

```
#include <stdio.h>

int main() {
    int x, y;

    printf("Enter the value of x and y:");
    scanf("%d %d", &x, &y);

    x = x|y;
    printf("Number is %d", x);

    return 0;
}
```

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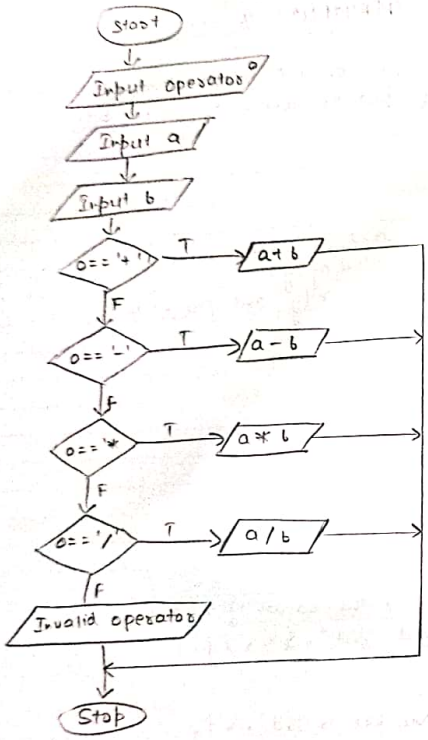


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## EXPERIMENT - 17

**OBJECTIVE :** Write a program in C to make simple calculator using switch cases.

**ALGORITHM :-**

Step 1 - Start.
Step 2 → Input operation as a character.
Step 3 → Input two value a and b.
Step 4 → Check the operation, for (+, -, *, /) then perform that operation on a and b, and save result.
Step 5 → If the operation is not in (+, -, *, /) then print "INVALID operation" else print result.
Step 6 → Stop.

**PROGRAM :**

```
#include <stdio.h>

int main()
{
    float a, b;
    char c;
    printf("Enter Operation : ");
    scanf("%c", &c);

    printf("Enter first value: ");
```

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OUTPUT:

Enter Operation : -
Enter the first value : 5
Enter the second value : 1

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```
        scanf("%f", &a);
        printf("Enter the second value ");
        scanf("%f", &b);

        switch(c)
        {
          case '+': printf("%f", a+b); break;
          case '-': printf("%f", a-b);
                    break;
          case '*': printf("%f", a*b);
                    break;
          case '/': printf("%f", a/b);
                    break;
          default : printf("INVALID OPERATOR!");
        };
}
```

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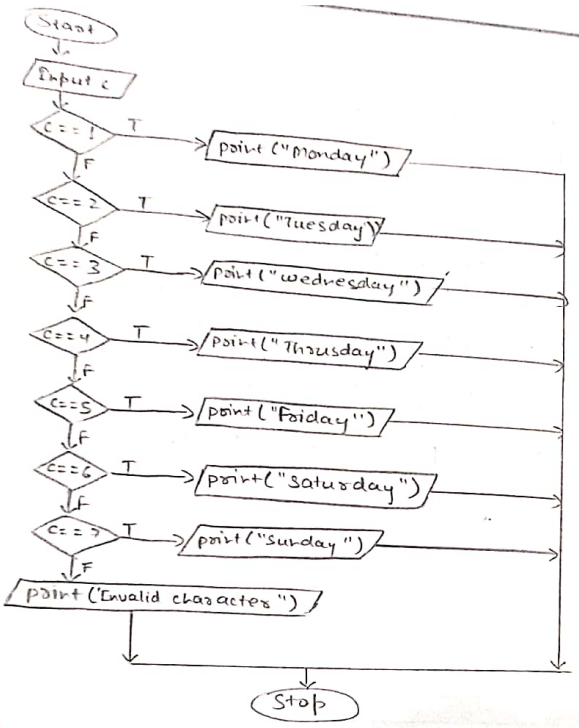


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## EXPERIMENT :- 18

**OBJECTIVE :** Write a program in C to mat Display Monday to saturday by input

**ALGORITHIM :**

Step1 - Start
Step2 -> Input the value of c
Step4 -> if c==1 then, print monday, and c==2 then ~~ex~~ print tuesday, and c==3 then print wednesday and if c==4 then print thrusday and goon to sunday.
Step-5 -> Stop.

**Program :**

```
#include <stdio.h>

int main() {
    char c;

    printf("Enter Input : ");
    scanf("%c", &c);

    switch(c)
    {
        case '1': printf("Monday "); break;
```

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Output :

Enter Input : 5

Friday.

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```
        case '2' : printf("Tuesday"); break;
        case '3' : printf("wednesday"); break;
        case '4' : printf("Thursday"); break;
        case '5' : printf("Friday"); break;
        case '6' : printf("Thursday"); break;
        case '8' : printf("Saturday"); break;
        case '8' : printf("Sunday"); break;
        default : printf("Invalid characters");
    }
    return 0;
}
```

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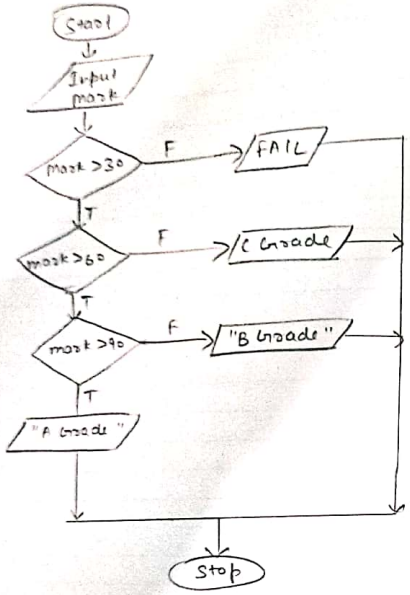


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## EXPERIMENT - 19

**OBJECTIVE :** Write a program in C to assign the Grade of a student by using nested if-else condition

**ALGORITHM :-**

Step 1 → Start
Step 2 → Input the number (marks).
Step 3 → If mark is less than 30, then print "FAIL" and move to step 7.
Step 4 → If marks is less than 60, then print "C Grade" and move to step 7
Step 5 → If mark is less than 90, then point "B Grade" and move to step 7.
Step 6 → If mark is greater than 90, and less than 100 then, print "A Grade" else "Invalid marks".
Step 7 → Stop.

**PROGRAM :**

```
#include <stdio.h>

int main() {
    int mark;
    printf("Enter Number : ");
    scanf("%d", &mark);
```

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OUTPUT :

Enter Marks : 40

C grade.

Date

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```
if (mark > 30)
{
    if (mark > 60)
    {
        if (mark > 90)
        {   printf("A grade ");
        }
        else {
            printf("B Grade ");
        }
    } printf("C Grade ");
}else {
    printf("Fail");
}
return 0;
}
```

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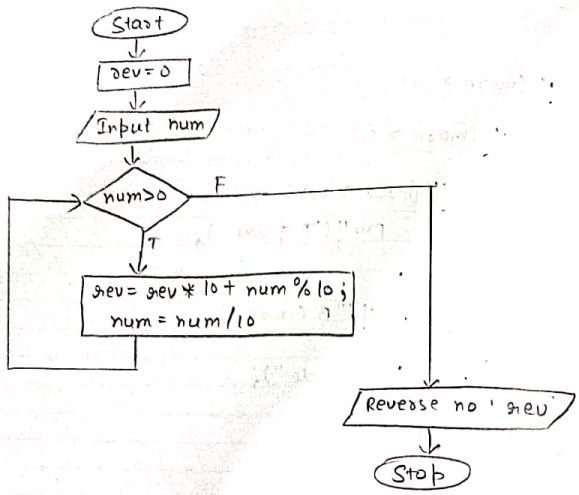


OUTPUT :

Enter Number : 321

Reverse Number : 123.

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## EXPERIMENT - 20

OBJECTIVE : Write a program in C to reverse the input number.

ALGORITHM :

Step-1 -> Start
Step2 -> Initialise rev=0.
Step3 -> Input Num.
Step4 -> rev = rev * 10 + num % 10;
Step5 -> num = num/10;
Step6 -> If num >0 then going to step 4.
Step7 -> Print reverse no.
Step 8 -> stop.

PROGRAM :

```
#include <stdio.h>

int main() {
    int num, rev = 0;
    printf ("Enter Number : ");
    scanf ("%d", &num);

    while (num>0) {
        rev = rev * 10 + num %10;
        num = num / 10;
    }
    printf ("Reverse Number : %d", rev);
}
```

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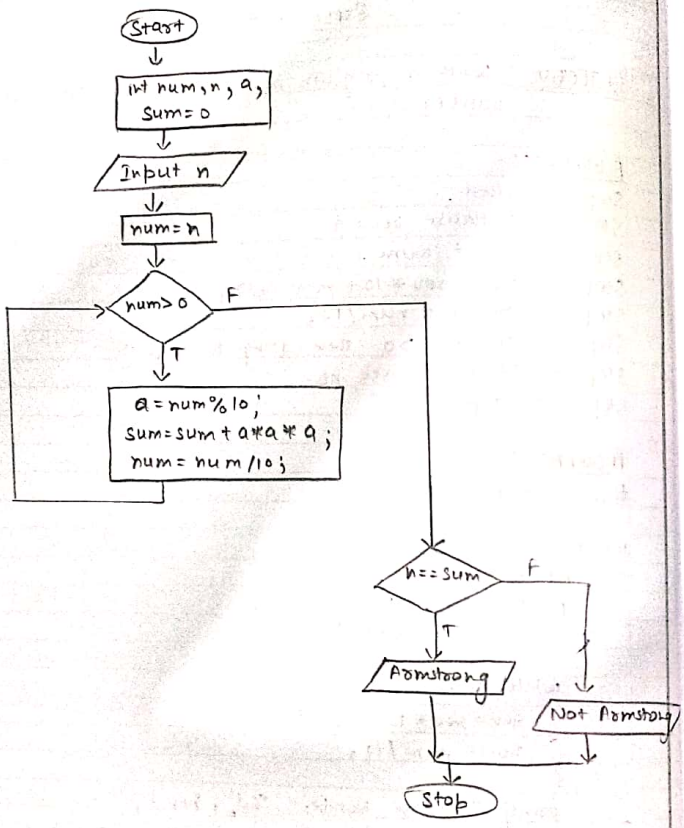


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## EXPERIMENT !- 21

**OBJECTIVE :-** Write a program in C to check the input number is armstrong or not.

**ALGORITHM :-**

Step1 - Start
Step2 → Input num
Step3 → Also store num to n variable and initialise sum = 0.
Step4 → Initialize a as last bit of num (num%10).
Step5 → increase value of sum with cube of a.
Step6 → num /= 10 and save to num variable.
Step7 → if num > 0, then return to step 4.
Step8 → if N == Sum, then print "Armstrong No",
else print "Not armstrong number",
Step9 → Stop.

**PROGRAM:-**

```
#include <stdio.h>

int main()
{
    int num, n, sum=0;

    printf("Enter number:");
```

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OUTPUT:

Enter num: 153

No is armstrong.

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```
scanf("%d", &n);
num = n;

while (num > 0)
{
   int a = num % 10;
   sum = sum + a*a*a;
   num = num / 10;
}

if (n == sum)
   printf("No. is armstrong.");
else
   printf("No. is not armstrong");
return 0;
}
```

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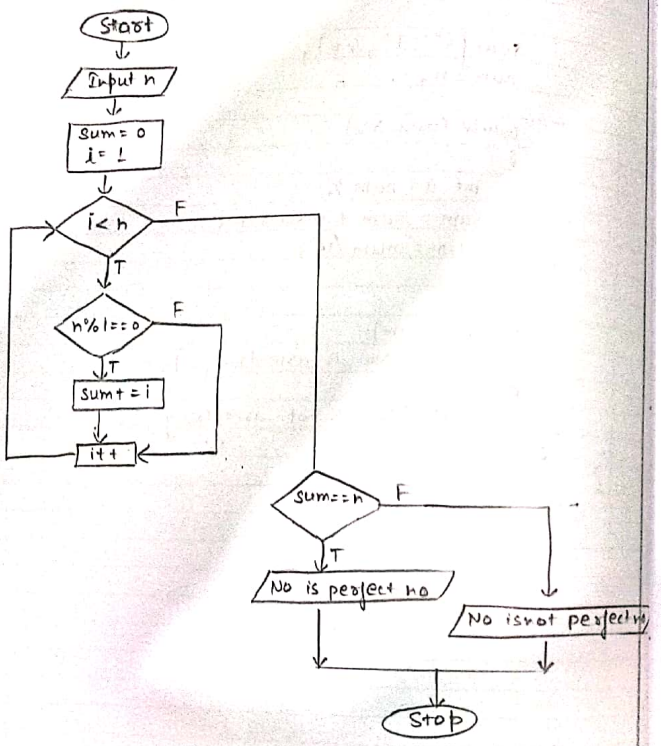


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## EXPERIMENT :- 22

**OBJECTIVE :** Write a program in C to check whether the input number is a perfect number or not.

**ALGORITHM :-**

Step1 -> start
Step2 -> Input n.
Step3 -> initialise sum=0 and i=1.
Step4 -> if n%i==0, then sum = sum+i;
Step5 -> Increament the value of i by 1.
Step6 -> if i<n, then, back to step 4.
Step7 -> if sum==n, then it's a perfect no, else it's not a perfect number.
Step 8 -> Stop.

**PROGRAM :**

```
#include <stdio.h>

int main()
{
    int n, sum = 0;
    printf("Enter two numbers : ");
    scanf("%d", &n);

    for(int i=1; i<=n; i++)
    {
```

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Output:

Enter the number: 126

No is not perfect no.

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```
        if (n%i == 0) {
            sum = sum + i;
        }
    }

    if (sum == n)
        printf ("No is perfect no");
    else
        printf ("No is not perfect no");
```

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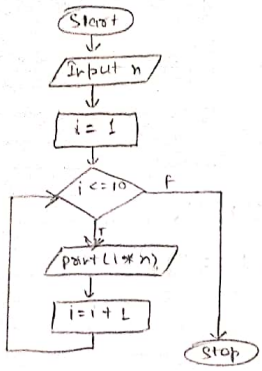


OUTPUT :-

Enter the no. : 3

3 * 1 = 3
3 * 2 = 6
3 * 3 = 9
3 * 4 = 12
3 * 5 = 15
3 * 6 = 18
3 * 7 = 21
3 * 8 = 24
3 * 9 = 27
3 * 10 = 30

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## EXPERIMENT :- 23

OBJECTIVE: write a program in C to print the table input value

ALGORITHM:

Step 1 - Start
Step 2 - Input n, initialise i = 1
Step 3 -> ~~if i<=10, then~~ print (n * i);
Step 4 -> i++.
Step 5 -> if i <= 10, then goto step 3
Step 6 - Stop.

PROGRAM:

```
#include <stdio.h>

int main()
{
    int a;
    printf("Enter the no. :");
    scanf("%d", &a);

    for(int i=1 ; i<=10 ; i++){
        printf("\n %d * %d = %d", a, ai, a*i);
    }
}
```

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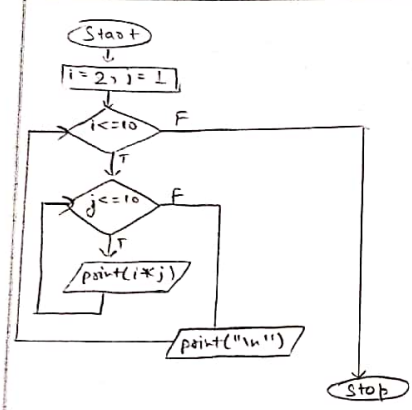


OUTPUT :

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 |
| 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| 6 | 12 | 18 | 24 | 30 | 36 | 42 | 48 | 54 | 60 |
| 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 |
| 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 |
| 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

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## EXPERIMENT :- 24

OBJECTIVE :- Write a program in C to print 1 to 10 tables.

ALGORITHM :-

Step 1 - Start

Step 2 -> Declare and initialize i = 2, j = 1

Step 3 -> do until i<=10 if condition false then goto 4

3.1 -> do until j<=10 if cond. false then goto 3.

3.1.1 -> print(i*j);

3.1.2 -> i++; j++;

3.1.3 -> Goto step 3.1.

Step 4 -> Stop.

PROGRAM :-

```
#include <stdio>
int main()
{
    for (int i=2; i<=10; i++){
        for (int j=1; j<=10; j++) {
            printf("%d", i*j);
        }
        printf("\n\n");
    }
    return 0;
}
```

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OUTPUT :-

Enter the no. 6

```
*
* *
* * *
* * * *
* * * * *
* * * * * *
```

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## EXPERIMENT - 25

OBJECTIVE :- Write a program to print pattern.

```
*
* *
* * *
* * * *
* * * * *
```

PROGRAM :-

```
#include <stdio.h>

int main()
{
    int a;
    printf("Enter the no.");
    scanf("%d", &a);

    for(int i=1; i<=a; i++){
        for(int j=1; j<=i; j++){
            printf("*");
        }
        printf("\n");
    }
    return 0;
}
```

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## EXPERIMENT:-2c

OBJECTIVE:- Write a C program to print the pattern.

```
* * * * *
* * * *
* * *
* *
*
```

PROGRAM:-

```
#include <stdio.h>

int main(){
    int a;
    printf("Enter the no.:");
    scanf("%d", &a);
    printf("\n");

    for(int i=1; i<=a; i++){
        for(int j=a; j>=i; j--)
        {
            printf("* ");
        }
        printf("\n");
    }
}
```

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OUTPUT

```
Enter the no.
4

* * * *
* * *
* *
*
```

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OUTPUT :-

```
Enter the number : 5
        *
      * *
    * * *
  * * * *
* * * * *
```

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## EXPERIMENT :- 27

OBJECTIVE :- Write a C program to print this pattern.

```
    *
  * *
* * *
* * * *
```

PROGRAM :-

```
#include <stdio.h>

int main()
{
    int a;
    printf("Enter the number : ");
    scanf("%d", &a);

    for(int i=1; i<=a; i++)
    {
        for (int j=a; j>=1; j--){
            if (i>=j)
                printf("*");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

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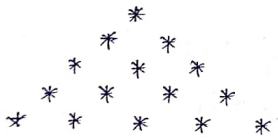
OUTPUT

Enter the number :- 5



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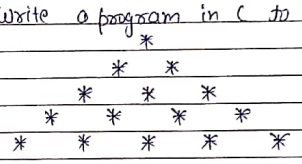
EXPERIMENT :- 28

OBJECTIVE : Write a program in C to print the pattern.



PROGRAM :

```
~~int n~~
#include <stdio.h>
int main()
{
    int a;
    printf("Enter the number:");
    scanf("%d", &a);

    for(int i=1; i<=a; i++) {
        for(int j=a; j>=1; j--) {
            if(i>=j)
                printf("* ");
            else
                printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

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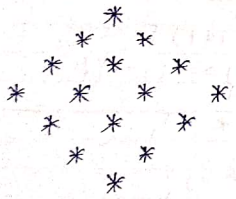
Output



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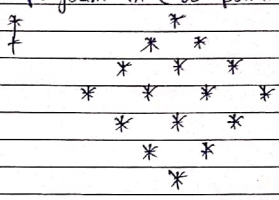
## EXPERIMENT:-29

OBJECTIVE: Write a program in C to print the pattern.



PROGRAM

```
#include <stdio.h>
int main() {
    int a=4;
    for (int i=1; i<=a; i++) {
        for (int j=a; j>=1; j--) {
            if (i>=j)
                printf("* ");
            else
                printf(" ");
        } printf("\n");
    }
    for (int i=1; i<=(a-1); i++) {
        for (int j=1; j<=(a-1); j++) {
            if (i<=j)
                printf(" *");
            else
                printf(" ");
        } printf("\n");
    }
}
```

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## EXPERIMENT :- 30

**OBJECTIVE :** Write a program to print the Pascal triangle.

**PROGRAM :-**

```
#include <stdio.h>

int main()
{
    int a, k;
    printf("Enter the number:");
    scanf("%d", &a);

    for(int i=1; i<=a; i++){
        int num=1, k=1;
        for(int j=a; j>=1; j--)
            if(i>=j)
            {
                printf("%d ", num);
                num = num * (i-k)/k;
                k++;
            }
            else
                printf(" ");
        printf("\n");
    }
    return 0;
}
```

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**OUTPUT**

```
Enter the number: 6
          1
        1   1
      1   2   1
    1   3   3   1
  1   4   6   4   1
1   5   10  10  5   1.
```

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OUTPUT:-

Enter the value of x : 2
Enter the value of y : -2

The answer is 0.25

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## EXPERIMENT - 31

OBJECTIVE :- Write a program in C to compute the value of $x^y$.

PROGRAM :-

```
#include <stdio.h>

int main() {
    int x, y, i;
    float z=1;

    printf("Enter the value of x:");
    scanf("%d", &x);
    printf("Enter the value of y:");
    scanf("%d", &y);
    if (y==0)
        z=1;
    else {
        for(i=1; i<=y or i<=(-y); i++) {
            if (y>0)
                z = z*x;
            else
                z = z/x;
        }
    }
    printf("The answer is %f", z);
}
```

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OUTPUT

Enter the number: 10
0 1 1 2 3 5 8 13 21 34.

## EXPERIMENT- 32

OBJECTIVE:- Write a program in C to print first n numbers of fibonacci series.

PROGRAM:

```
#include <stdio.h>

void main() {
        int a, i=0, j=1, k;

        printf("Enter the number: ");
        scanf("%d", &a);

        if (a > 2) {
            printf("%d %d ", i, j);
            while(a-2) > 0)
            {
                k = i+j;
                printf("%d ", k);
                i=j;
                j=k;
                a--;
            }
        }
        else if (a==1)
            printf("%d", i);
        else
            printf("Please enter valid no.");
}
```

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With only one for loop.

(2) ↳ #include <stdio.h>

```
void main()
{
    int last, i, row=1, cnt=0;
    printf("Enter the last value :");
    scanf("%d", &last);

    for(i=1; i<=last; i++)
    {
        printf("%d ", i);
        cnt++;
        if (cnt == row) {
            printf("\n");
            row++;
            cnt = 0;
        }
    }
    printf("%d");
}
```

OUTPUT

↳ Enter the last value :- 28.

```
1
2  3
4  5  6
7  8  9  10
11 12 13 14 15
16 17 18 19 20 21
22 23 24 25 26 27 28
```

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EXPERIMENT :- 33

OBJECTIVE :- Write a program in C to print floyd triangle.

PROGRAM.

(1) - #include <stdio.h>

```
int main()
{
    int a, i, j, k=1;

    printf("Enter the last value :");
    scanf("%d", &a);

    for(i=1; a>k; i++)
    {
        for(j=1; j<=i and a>=k; j++){
            printf("%d ", k);
            k++;
        }
        printf("\n");
    }
}
```

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## EXPERIMENT :- 34

OBJECTIVE :- Write a program in C using loop and conditional to determine number between 0 to n are :-

(a) - Multiple of 2

(b) - Multiple of 2 not 5.

(c) - Multiple of 2 and 5 or both.

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OUTPUT :

Enter the value of n : 10
The output is 8.

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## EXPERIMENT - 35

OBJECTIVE : Write a program to determine the greatest power of 2 which is less than or equal to input value n. Your program should take the value of n from user.

Program

```
#include <stdio.h>

int main()
{
    int n, i=1;

    printf("Enter the value of n:");
    scanf("%d", &n);

    while (i<=n)
        i = i * 2;

    printf("The output is %d", i/2);
}
```

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Output :
Enter the first number : 81
Enter the second number : 27

The GCD is 27.

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## EXPERIMENT :- 36

OBJECTIVE : Write a program in C to find the GCD of two numbers.

PROGRAM :

```
#include <stdio.h>

int main() {
    int a, b, i;

    printf("Enter the first number : ");
    scanf("%d", &a);
    i = a;

    printf("Enter the second number : ");
    scanf("%d", &b);

    while(i > 0)
    {
        if (a%i == 0 && b%i == 0)
        {
            printf("The GCD is %d", i);
            break;
        }
        i--;
    }
}
```

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OUTPUT :-

```
Enter number : 23
23 is a prime number.
```

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## EXPERIMENT :-37

OBJECTIVE : Write a program in C to make a function checkprime which takes an integer as an argument.

PROGRAM :

```
#include <stdio.h>

bool checkPrime(int a) {
        int i;
        for(i=2;i*i<=a;i++)
            if(a%i==0)
                return 0;
        return 1;
}

int main() {
        int a;
        printf("Enter number : "); scanf("%d",&a);

        if(checkPrime(a))
            printf("%d is a prime number.",a);
        else
            printf("%d is not a prime number",a);

        return 0;
}
```

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checkPrime function.

```
bool checkPrime(int a) {
    int i;
    for(i=2; i*i<=a; i++) {
        if (a%i==0)
            return 0
    }
    return 1;
}
```

OUTPUT :-

Enter number : 7

2 5

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## EXPERIMENT - 38

OBJECTIVE :- Take an integer as an input from the user and use the function checkPrime to express integer as a sum of two prime number. Choose the numbers in such a way that first no. is smallest possible prime number. and if it is not possible, then print 0.

PROGRAM! .

```
#include<stdio.h>

int sum2(int a) {
    int i, j=0;
    for (i=2; i<=(a-i); i++) {
        if (checkPrime(i) && checkPrime(a-i)) {
            printf("%d %d \n"), i, a-i);
            return 0;
        }
    } return 1;
}
int main() {
    int a, b;
    printf("Enter number : ");
    scanf("%d", &a);
    b = sum2(a);
    if(b)
        printf("~~not~~ 0");
    return 0;
}
```

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OUTPUT:-

```
Enter the n value : 7
28
```

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## EXPERIMENT:-39

OBJECTIVE:- Write a program in C to find sum of first n natural numbers using recursive function.

PROGRAM:-

```
#include <stdio.h>

int sum (int n) {
    if (n == 1)
        return 1;
    else
        return n + sum(n-1);
}

int main() {
    int n;

    printf("Enter the n value: ");
    scanf("%d", &n);

    printf("%d", sum(n));
}
```

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## EXPERIMENT:- 40

**OBJECTIVE:-** Write a program in C using recursive function to print fibonnaci series up to n term.

**PROGRAM:-**

```
#include <stdio.h>

int fib(int n) {
    if (n==1)
        return 0;
    else if (n==2)
        return 1;
    return (fib(n-1) + fib(n-2));
}

int main()
{
    int n,i;

    printf("Enter the value of n:");
    scanf("%d", &n);

    for(i=1; i<=n; i++)
        printf("%d", fib(i));

}
```

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**OUTPUT:-**

```
Enter the value of n: 6
0 1 1 2 3 5
```

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## EXPERIMENT : 41

**OBJECTIVE :-** Write a program in C to find the GCD of two numbers using recursive function.

**PROGRAM :-**

```
#include <stdio.h>

int gcd(int a, int b) {
    int c;

    if (a%b == 0)
        return b;
    else
        gcd(b, a%b);
}

int main() {
    int a,b;

    printf("Enter the value of a : ");
    scanf("%d", &a);
    printf("Enter the value of b: ");
    scanf("%d", &b);

    printf("The GCD of %d and %d is %d", a, b,
            gcd(a,b));
}
```

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**OUTPUT :-**

```
Enter the value of a: 35
Enter the value of b: 28
The GCD of 35 and 28 is 7.
```

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## EXPERIMENT :-42

OBJECTIVE :- There is a person standing on the ground floor of the stair, the person can jump a single step or 2 steps at a time. find total no of ways to reach at the nth stair.

PROGRAM :-

```
#include <stdio.h>

int count(int n){
    if (n==1||n==0)
        return 1;
    return count(n-1) + count(n-2);
}

int main(){
    int n;
    printf("Enter the no. of stair:");
    scanf("%d", &n);

    printf("%d", count(n));
}
```

OUTPUT :-

```
Enter the no. of stair : 12.
233.
```

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OUTPUT :

Enter the no: 123321
The no. is pallindrome.

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## EXPERIMENT - 43

OBJECTIVE :- Write a program in C to check whether the given number is pallindrome or not using recursion.

PROGRAM :-

```
#include <stdio.h>

int res = 0;
int checkp(int a) {
    if(a == 0 || a == 1)
        return res;
    res = res*10 + a%10;

    return (checkp((int)a/10));
}

int main() {
    int a;
    printf("Enter the no.:");
    scanf("%d", &a);

    if (checkp(a) == a)
        printf("The no. is pallindrome.");
    else
        printf("The no is not pallindrome.");

}
```

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OUTPUT :-
Enter the value of a and b : 5
5
→ 3125

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## EXPERIMENT :- 44

OBJECTIVE : Write a program in C using recursive function to find power.
for examp - $2^{10} = 1024$.

PROGRAM :-

```
#include <stdio.h>
int exp(int a, int b)
{
    if(b==1)
        return a;
    else{
        if(b%2==0)
            return exp(a*a, b/2);
        else
            return exp(a*a, b/2)*a;
    }
}

int main(){
    int a, b;
    printf("Enter the value of a and b : ");
    scanf("%d %d", &a, &b);

    printf("%d", exp(a,b));
}
```

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OUTPUT:
Enter the value of a and b: 2
7

The output is 128.

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## EXPERIMENT:- 45

OBJECTIVE:- Write a program in C to find power using the previous question with for loop. (algorithm)

Program:

```
#include <stdio.h>

int main()
{
    int a, b, c = 1;

    printf("Enter the value of a and b: ");
    scanf("%d %d", &a, &b);

    for(; b!=1 and b!=0; b=b/2)
    {
        if (b%2 != 0)
            c = c*a;
        a = a*a;
    }
    c = c*a;

    printf("The output is %d", c);
}
```

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OUTPUT

Enter the value of n : 5
Enter the value of r: 3

10

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## EXPERIMENT : 46

OBJECTIVE : Write a program in C to calculate the Binomial Co-efficient using recursion.

PROGRAM:

```
#include <stdio.h>

int bin(int n, int r) {
    if (r==0 || r==n)
        return 1;
    return bin(n-1, r-1) + bin(n-1, r);
}

int main() {
    int n, r;

    printf("Enter the value of n: ");
    scanf("%d", &n);
    printf("Enter the value of r: ");
    scanf("%d", &r);

    printf("%d", bin(n,r));
}
```

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OUTPUT:

```
Enter the no's in 0 and 1 :
0
0
0
0
1
0
1
1
-> 11
```

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## EXPERIMENT :- 47

OBJECTIVE : Write a program to read an integer 1-D array containing 8-bits (0, 1) of an unsigned binary integer and print decimal value for integer.

PROGRAM :

```
#include <stdio.h>

int exp(int a, int b) {
        if (b == 0)
            return 1;
        else if (b%2 == 0)
            return exp(a*a, b/2);
        else
            return (exp((a*a, b/2) * a);
}
int main() {
        int i, j=7, rel=0, arr[8];
        printf("Enter the no's in 0 and 1 ");
        for(i=0; i<8; i++)
            scanf("%d", &arr[i]);

        for(i=7; i>=0; i--)
            rel = rel + arr[i] * exp(2, j-i);

        printf("%d", rel);
}
```

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OUTPUT :- Enter the value of n : 11

arr[0] : 0
arr[1] : 1
arr[2] : 0
arr[3] : 1
arr[4] : 1
arr[5] : 1
arr[6] : 1
arr[7] : 0
arr[8] : 0
arr[9] : 1
arr[10] : 1

Longest 1's length : 4.

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## EXAMPLE :- 48

OBJECTIVE : Write a program to read 1-D array containing n-element which consists of 0's and 1's and print the length of longest consecutive of 1's.

Program :

```
#include <stdio.h>

int main() {
    int i, size, c = 0, maxc = 0;

    printf("Enter the value of n : ");
    scanf("%d", &size);
    int arr[size];

    for(i=0; i<size; i++) {
        printf("arr[%d] = ", i);
        scanf("%d", &arr[i]); }

    for(i=0; i<size; i++)
        if(arr[i] == 1) {
            c=c+1;
            if(maxc < c)
                maxc = c; }
        else
            c = 0;
    printf("\n Longest 1's length : %d ", maxc);
}
```

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OUTPUT

The minimum value is 10 at 0.

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EXPERIMENT - 49

OBJECTIVE :- Write a program in C to find min. elements with there index from an array using loop.

PROGRAM :-

```
#include <stdio.h>

int main() {
    int i, size, min, p = 0;

    int arr[] = {10, 20, 30, 15, 20, 25};
    size = sizeof(arr) / sizeof(arr[0]);

    min = arr[0];
    for(i=0; i<size; i++)
        if (min > arr[i])
        {
            min = arr[i];
            p = i;
        }

    printf("The minimum value is %d at %d", min, p);
}
```

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OUTPUT:-

```
Enter the size of array : 5
Enter arr[0] : 15
Enter arr[1] : 20
Enter arr[2] : 10
Enter arr[3] : 17
Enter arr[4] : 7

Min value : 7.
```

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## EXPERIMENT :- 50

OBJECTIVE :- Write a program in C to find minimum value of an array using recursion.

PROGRAM :-

```
#include <stdio.h>

int mint (int arr[], int s ; int min) {
        if(s==1)
            return min ;
        if (min > arr[s-1])
            min = arr[s-1] ;
        mint(arr ,s-1 , min) ;
}

int main()
{
    int i , size ;
    printf ("Enter the size of array ");
    scanf ("%d ", &size) ;

    int arr[size] ;
    for(i=0 ; i<size ;i++) {
        printf("Enter arr[%d] = ", i) ;
        scanf ("%d ", &arr[i]);
    }
    printf ("Min value : %d ", mint(arr , size , arr[0]));
}
```

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```
    if (ls(arr, f, size))
        printf("found");
    else
        printf("Not found");
}
```

OUTPUT: with while loop.
found 25 with while loop using L.S

finding with recursion:
found.

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## EXPERIMENT:- 51

OBJECTIVE:- Write a program in C to search an element in array using linear search.

PROGRAM:

```
#include<stdio.h>
int ls(int arr[], int f, int size)
{
    if (size==0)
        return 0;
    if (arr[size-1]==f)
        return 1;
    ls(arr, f, size-1);
}

int main() {
    int size=7, f=25, i, flag=0;
    int arr[size]={10,15,20,17,18,5,15}
    printf("with while loop:");
    for(i=0; i<size; i++) {
        if(arr[i]==f)
            flag=1;
    }
    if(flag)
        printf("found 25 with while loop using L.S");
    else
        printf("Not found");
    printf("finding with recursion: ");
```

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OUTPUT

->Enter the elements to search:-
18
Element not found.

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## EXPERIMENT:-32

OBJECTIVE => Write a program in C to search an element in array using Binary search.

PROGRAM:-

```
#include <stdio.h>
int main()
{
    int i, size = 10, f, l, r, m, flag = 0;
    int arr[] = { 10, 11, 13, 15, 17, 20, 25, 30, 35, 36 };

    printf("Enter the elements to search : ");
    scanf("%d", &f);

    l = 0; r = size - 1;
    while (r >= l && flag == 0)
    {
        m = (l + r) / 2;
        if (arr[m] == f)
            flag = 1;
        else if (arr[m] < a)
            l = m + 1;
        else
            r = m - 1;
    }
    if (flag)
        printf("Element found.");
    else
        printf("Element Not found");
}
```

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OUTPUT

Not found.

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## EXPERIMENT:-53

OBJECTIVE:- Write a program in C to search an element in array using recursion with Binary search.

PROGRAM:-

```
#include <stdio.h>
int bs(int arr[], int l, int r, int f ) {
    if (r<l)
        return 0;
    int m = (l+r)/2 ;

    if (arr[m] == f)
        return 1;
    else if (arr[m] > f)
        bs(arr, l, m-1, f );
    else
        bs(arr, m+1, r, f );
}
int main()
{
    int size = 10;
    int arr[10] = {10,20,30,40,55,60,62,63,64,65};

    if (bs(arr, 0, size-1, 54 )
        printf("54 found");
    else
        printf("Not found);
}
```

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