Basic Programming

01. Print "Hello, World!".

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

int main(){
    cout<<"hello world";

    return 0;
}
```

Output :

Hello world

02. Add Two Integers.

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

int main(){
    int a,b,c;
    a=20;
    b=20;
    c=a+b;
    cout<<c;
    return 0;
}
```

Output:

40

03.Swap Values of Two Variables.

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

int main(){
    int a,b,c;
    cout<<"Type the value of a before swap" <<endl;
    cin>>a;
    cout<<"Type the value of b before swap" <<endl;
    cin>>b;
    c=a;
    a=b;
    b=c;
     cout<<"After swap";
     cout<<"The value of a after swap" <<endl;
     cout<<a <<endl;
     cout<<"The value of b after swap" <<endl;
     cout<<b ;
    return 0;
}
```

Output:

Type the value of a before swap

123

Type the value of b before swap

456

After swapThe value of a after swap

456

The value of b after swap

123

04. Multiply two Floating Point Numbers.

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

int main(){
    float a ,b,c;
    cout<<"Enter your float number for multiply" <<endl;
    cin>>a;
    cin>>b;
    c=a*b;
    cout<<"Your Answer : " <<c;

    return 0;
}
```

05. perform all arithmetic operations.

```cpp
#include <iostream>
using namespace std;
int main(){
int a,b,c;
cout<<"perform all arithmetic operations.(+,-,*,/)" <<endl;
cout<<"Enter Two Number for addition" <<endl;
cin>>a;
cin>>b;
c=a+b;
cout<<"Your Answer : "<<c <<endl;
cout<<"Enter Two Number for sub" <<endl;
cin>>a;
cin>>b;
c=a-b;
cout<<"Your Answer : "<<c <<endl;
cout<<"Enter Two Number for mul" <<endl;
cin>>a;
cin>>b;
c=a*b;
cout<<"Your Answer : "<<c <<endl;
cout<<"Enter Two Number for div" <<endl;
cin>>a;
cin>>b;
c=a/b;
cout<<"Your Answer : "<<c <<endl;   return 0}
```

```
output:
Enter Two Number for addition
40
50
Your Answer : 90
Enter Two Number for sub
40
50
Your Answer : -10
Enter Two Number for mul
40
50
Your Answer : 2000
Enter Two Number for div
40
50
Your Answer : 0
```

another way

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

int main(){
    int number1,number2;
    int add,sub,mul,mod;
    float div;

    cout<<"Enter your First Number : " <<endl;
    cin>>number1;
    cout<<"Enter your Second Number : " <<endl;
    cin>>number2;

    add=number1+number2;
    sub=number1-number2;
    mul=number1*number2;
    mod=number1%number2;
    div=(float)number1/number2;

    cout<<"add to two number : " <<add <<endl;
    cout<<"sub to two number : " <<sub <<endl;
    cout<<"mul to two number : " <<mul <<endl;
    cout<<"mod to two number : " <<mod <<endl;
    cout<<"div to two number : " <<div <<endl; return 0}
```

```
output:
Enter your First Number :
40
Enter your Second Number :
50
add to two number : 90
sub to two number : -10
mul to two number : 2000
mod to two number : 40
div to two number : 0.8
```

06. convert feet to meter.

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

int main(){
float a, b;
 cout<<"enter your number to convert feet to meter"<<endl;
cin>>a;
b=a / 3.281;
cout<<a <<" feet is equals to :" <<b;

    return 0;
}
```

```
Output:
enter your number to convert feet to meter
1
1 feet is equals to :0.304785
```

07. convert celcius to farenheit.

```cpp
#include <iostream>
using namespace std;
int main(){
  float a,b;
  cout<<"Give number to change celcius to ferenheit"<<endl;
  cin>>a;
  b=(a*9/5)+32;
  cout<<a <<" degree celcius is equals to :   " <<b <<" ferenheit"<<endl;

    return 0;
}
```

Output:
Give number to change celcius to ferenheit
10
10 degree celcius is equals to :   50 ferenheit

08. convert farenheit to celcius.

```cpp
#include <iostream>
using namespace std;
int main(){

float F,C;

cout<<"enter your number to change farenheit to celcius." <<endl;

cin>>F;

C=((F-32)*5)/9;

cout<<F <<" degree farenheit is equals to : " <<C <<" degree celcius";

    return 0;
}
```

output:
enter your number to change farenheit to celcius.
450
450 degree farenheit is equals to : 232.222 degree celcius

another way

```cpp
#include<iostream>
using namespace std;
int main()
{
    float celsius, fahrenheit;

    cout << "Please temperature in Fahrenheit: ";
    cin >> fahrenheit;

    celsius = (fahrenheit - 32) * 5 / 9; // Formula to caltulate Fahrenheit to Celsius
    cout<< "temperature in Celsius : " << celsius;

    return 0;
}
```

09. find the Size of data types.

```cpp
#include <iostream>
using namespace std;
int main(){   int a;
    string b;
    float c;
    double d;
    char e;
    long f;
    short g;
    cout<<"size of int data type is : "<<sizeof(a) <<endl;
    cout<<"size of string data type is : "<<sizeof(b)<<endl;
    cout<<"size of float data type is : "<<sizeof(c)<<endl;
    cout<<"size of double data type is : "<<sizeof(d)<<endl;
    cout<<"size of char data type is : "<<sizeof(e)<<endl;
    cout<<"size of long data type is : "<<sizeof(f)<<endl;
    cout<<"size of short data type is : "<<sizeof(g)<<endl;
    return 0;}
```

output:
size of string data type is : 24
size of float data type is : 4
size of double data type is : 8
size of char data type is : 1
size of long data type is : 4
size of short data type is : 2

10. Print ASCII Value.

what is ASCII value?

ASCII, in full American Standard Code `for` Information Interchange, a standard data-encoding format `for` electronic communication between computers. ASCII assigns standard numeric values to letters, numerals, punctuation marks, and other characters used in computers.

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

int main(){
    char a;
    cin>>a;
    cout<<"ASCII VALUE OF " <<a <<" is " <<int(a);
     return 0;
}
```

output:
ASCII VALUE OF a is 96

int(a) is the value of char a is convert into interger ;

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

int main(){
    int a;
     cout<<"enter your ascii number to find the corresponding value : " <<endl;
    cin>>a;

    cout<<"ASCII VALUE OF " <<a <<" is " <<char(a);
     return 0;
}
```

output:
enter your ascii number to find the corresponding value :
40
ASCII VALUE OF 40 is (

11. Calculate Area of Circle.

```cpp
#include <iostream>
#define PI 3.141
using namespace std;
int main(){
    float radius ,area;
    cout<<"to find the area of cicle type value of radius : " <<endl;
    cin>>radius;
    area=radius*PI*radius;
    cout<<"Area of cicle is : " <<area;
    return 0;
    }
```

12.Calculate Area of Square.

```cpp
#include <iostream>
using namespace std;
int main(){

    float side ,area_of_square ;
    cout<<"enter the side of square : "<<endl;
    cin>>side;
    area_of_square=side*side;
    cout<<"the area of square is : " <<area_of_square;
    return 0;
}
```

13. Calculate Area of Rectangle.

```cpp
#include <iostream>
using namespace std;
int main(){

    float length,width ,area_of_rectangle ;
    cout<<"enter the length of square : "<<endl;
    cin>>length;
     cout<<"enter the width of square : "<<endl;
    cin>>width;
   area_of_rectangle=length*width;
    cout<<"the area of rectangle is : " <<area_of_rectangle;
    return 0;
}
```

output:
enter the length of square :
10
enter the width of square :
10
the area of rectangle is : 100

14. convert days to years, weeks and days.

```cpp
#include<iostream>
using namespace std;
int main()
{
    int days, years, weeks;
    cout << "Enter days:";    // Read total number of days from user
    cin >> days;

    years = (days / 365);
    weeks = (days % 365) / 7;
    days  = days - ((years * 365) + (weeks * 7));
    cout << "Years : " << years <<endl;
    cout << "weeks : " << weeks <<endl;
    cout << "Days : " << days <<endl;

    return 0;
}


#include<iostream>

using namespace std;

int main()
{
int y,d,w;

cout<<"Enter No. of days:";
cin>>d;
y=d/365;
d=d%365;
w=d/7;
d=d%7;
cout<<"\nYears: "<<y<<"\nWeeks: "<<w<<"\nDays: "<<d;
return 0;
}
```
output:
Enter No. of days:8
Years: 0
Weeks: 1
Days: 1

8 output dia ,matlab january 8 hai , 1 week hai week ka day 1 hai ,

STRING

01. concatenate two strings

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

int main(){
    string a ,b,c ;
    a="hello ";
    b="world";
    c=a+b;
    cout<<c;
     return 0;
}
```
output: hello world

another way

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

int main(){
    string a,b,c ;
    cout<<"enter your string 1" <<endl;

     getline(cin,a);

    cout<<"enter your string 2" <<endl;
    getline(cin,b);

    c=a+b;
    cout<<c ;

     return 0;
}
```

output:
enter your string 1
amarth patel
enter your string 2
lucky kushwah
amarth patellucky kushwah

02. to find string length

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

int main(){
  string a;
  cout<<"Enter your string" <<endl;
  getline(cin,a);
  cout<<a.length();;
    return 0;
}
```

output:
Enter your string
amarthpatel
11

03. convert a string to Lower case

```cpp
#include <iostream>
#include <string.h>
using namespace std;

int main()
{
   char string[10];

   cout<<"Input a string to convert to lower case"<<endl;
   cin.getline(string, 10);

   cout<<"Character in lowercase:"<< strlwr(string);
   // strlwr is use to convert upper case character to lower case

   return  0;
}
```
OUTPUT:
Input a string to convert to lower case
AMARTH
Character in lowercase:amarth

04. convert a string to Upper case

```cpp
#include <iostream>
#include <string.h>
using namespace std;

int main(){
 char a[100];
 cout<<"enter your string to convert into upper case"<<endl;
 cin.getline(a,100);
 cout<<strupr(a);
}
output:
enter your string to convert into upper case
amarthpatel
AMARTHPATEL
```

05. change string to upper case without strupr

```cpp
#include <iostream>
#include <string.h>
using namespace std;

    void functionupper(char []);

    int main()
    {
        char string[100];

        cout<<"Enter a string to convert it into upper case"<<endl;
        cin>>string;

        functionupper(string); // calling functionupper
        cout<<"Entered string in upper case is: "<< string;

        return 0;
    }
    void functionupper(char s[]) {
        int c = 0;

        while (s[c] != '\0') {
            if (s[c] >= 'a' && s[c] <= 'z') {
                s[c] = s[c] - 32;
            }
            c++;}}
```

06. to compare two strings using strcmp

```cpp
#include <iostream>
#include <string.h>

#define MAX_SIZE 100 //Maximum size of the string
using namespace std;

int main()
{
    char str1[1000], str2[1000];

    cout<<"Enter the first string"<<endl;
    cin>>str1;

    cout<<"Enter the second string"<<endl;
    cin>>str2;

    if (strcmp(str1,str2) == 0)
        cout<<"Entered strings are equal"<<endl;
    else
        cout<<"Entered strings are not equal"<<endl;

return 0;

}
```
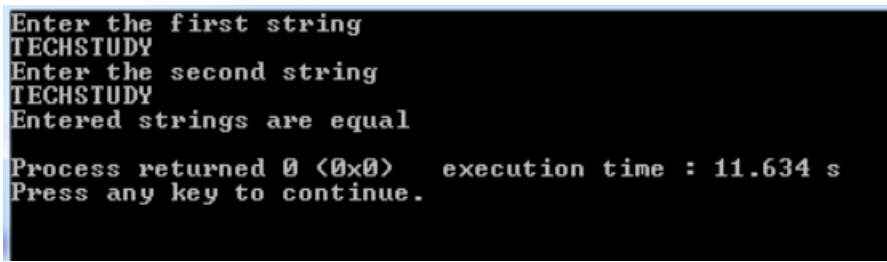
Conditions

01.Check whether an integer entered by the user is odd or even

even number are those which reminder is zero ;
odd number are those which reminder isnot zero ;
0 is a even number .

```cpp
#include <iostream>
using namespace std;
int main(){

    int a;
    cout<<"enter your number to check is even or odd" <<endl;
    cin>>a;
    if (a%2==0)
    {
        cout<<"number is even";
    }
    else{
        cout<<"number is odd";
    }
        return 0;
}
```
output:
enter your number to check is even or odd
3
number is odd

```cpp
#include <iostream>
using namespace std;
int main(){

    int a;
    cout<<"enter your number to check is even or odd"<<endl;
    cin>>a;
    string b =(a%2==0) ? "even":"odd";
    cout<<b;

        return 0;}
```
 output:
enter your number to check is even or odd
2
even

02. find the largest number among three number.

```cpp
#include <iostream>

using namespace std;

int main() {
    int num1 , num2 , num3;

    cout<<"Enter three Number " <<endl;

    cin>>num1 >>num2 >>num3 ;

    if (num1 >= num2 && num1 >= num3)
    {
        cout<<"the num1 is largest among three : " <<num1;

    }

        if (num2 >= num1 && num2 >= num3)
    {
        cout<<"the num2 is largest among three : " <<num2;

    }

        if (num3 >= num1 && num3 >= num2)
    {
        cout<<"the num3 is largest among three : " <<num3;

    }
    return 0;
}

output:
Enter three Number
10
50
10
the num2 is largest among three : 50
```

03.C++ Program to Find the Largest Number using Conditional Operator.

```cpp
#include <iostream>
using namespace std ;
int main(){

    int num1 ,num2 ,num3,largest ;
    cout<<"Enter three number : ";
    cin>>num1 >>num2 >>num3 ;

 largest=(num1>num2) ?   (num1 > num3 ? num1 : num3 ) : ( num2>num3 ?num2 :num3);

cout<<"largest number is : " <<largest;
}
output :
Enter three number : 10
20
30
largest number is : 30
```

04.find the Largest among Three Variables using Nested if.

```cpp
#include <iostream>
using namespace std;
int main(){ int num1 ,num2,num3 ;
  cout<<"enter three number : "<<endl;
  cin>>num1 >>num2 >>num3 ;
 if (num1>num2)
  {
    if (num1>num3)
    {
        cout<<"largest number is : "<<num1;
    }
    else
    {
        cout<<"largest number is : "<<num3;

    }

  }

if (num2>num1)
{
    if (num2>num3)
    {
        cout<<"largest number is : "<<num2;
    }
    else
    {
        cout<<"largest number is : "<<num3;
    }
}

return 0;

}


output:
enter three number :
30
20
10
largest number is : 30
```

05.check leap year using conditional Operator.

|| logical or operator Returns true if one of the statements is true

```cpp
#include <iostream>

using namespace std;

int main() {
    int year;

    cout << "Enter a year: ";
    cin >> year;



(year % 400 == 0 || (year % 4 == 0 && year % 100 != 0)) ?
cout << year << " is a leap year." : cout << year << " is not a leap year.";

    return 0;
}
```

OUTPUT:
Enter a year: 2024
2024 is a leap year.

if year % 400 == 0 is true = is a Leap year ;
if year % 4 == 0 is true = is a Leap year ;

 leap year if perfectly divisible by 400

  not a leap year if divisible by 100
  but not divisible by 400

    leap year if not divisible by 100
  but divisible by 4

1900 is not a leap year but it is divided by 4 and 100 ;

```cpp
#include <iostream>

using namespace std;

int main() {
    int year,b;
    cout<<"enter year" <<endl;
    cin>>year;
    b=year%400;
    cout<<b <<endl;

    cout<<"enter year" <<endl;
    cin>>year;
    b=year%100;
    cout<<b <<endl;

    cout<<"enter year" <<endl;
cin>>year;
    b=year%4;
    cout<<b <<endl;

return 0;
}
```

output:
enter year 400
1900
300

enter year 100
1900
0

enter year 4
1900
0

06.check alphabets using conditional operator

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

int main()
{
    char a,b;

    cout<<"enter ";
    cin>>a;
    cout<<((( a>='a' && a<='z' ) || (a>='A' && a<='Z' ) ) ? " its a alphbet" :
"its not a alphabet");

    return 0;
}
output:
enter a
its a alphbet
```

07.check number is positive, negative or zero.

```cpp
#include <iostream>
using namespace std;
int main(){
    int a ;
    cout<<"enter your number : " <<endl;
    cin>>a;

    if (a<=-1)
    {
      cout<<"number is negative" <<endl;

    }
    else if (a>=1) {
cout<<"number is postive" <<endl;
    }
    else (
     cout<<"number is zero"
    );
    return 0;}
OUTPUT: enter your number : 1

number is postive
```

08. check uppercase or lowercase alphabets.

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

int main(){
    char a ;
    cout<<"enter a aphabate" <<endl;
    cin>>a;
    if (a>='a' && a<='z')
    {
     cout<<"lower case alphabate";

    }

    else if (a>='A' && a<='Z'){

cout<<"UPPER case alphabate";
    }

    else{
     cout<<"NOT A alphabate";
    }

     return 0;
}
output:
enter a aphabate
a
lower case alphabate
```

09. check entered character vowel or consonant.

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

int main(){
    char a, b ;

    cout<<"enter a alphabate to check  character vowel or consonant. : " <<endl;
    cin>>a;

    if (a== 'a' && 'e' && 'i' && 'o'&& 'u' || a=='A' && 'E' && 'I' && 'O'&& 'U')
    {
     cout<<"vowel";
    }
    else{
     cout<<"consonant";
    }
       return 0;
}

// OUTPUT :
enter a alphabate to check  character vowel or consonant. :
A
vowel
```

10.check whether a character is alphabet, digit or special character.

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

int main(){
    char a;
    cout<<"enter a character : " <<endl;
    cin>>a;
 if (a>='a' && a<='z'|| a>='A'&& a<='Z' )
 {
  cout<<"alphabet";
 }

 else if (a>=0 && a<=9){
    cout<<"digit";
}
else{
    cout<<"special character";
}

    return 0;
}

output :
enter a character :
+
special character
```

11. print day name of week

```cpp
#include <iostream>
using namespace std;
int main(){
int week;
cout<<"Enter week (1-7) : "<<endl;
cin>>week;
if (week==1)
{
    cout<<"monday";
}
else if (week==2)
{
    cout<<"tuesday";
}
else  if (week==3)
{
    cout<<"wednesday";
}
else if (week==4)
{
    cout<<"thusday";
}
else if (week==5)
{
    cout<<"friday";
}
else if (week==6)
{
    cout<<"saturday";
}
else if (week==7)
{
    cout<<"Sunday";
}

else{
    cout<<"invalid enter";
}
return 0;}
output:
Enter week (1-7) :
5
friday
```

12. to accept two integers and check whether they are equal or not.

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

int main(){

  int a,b;

  cout<<"enter   two integers and check whether they are equal or not." <<endl;
   cout<<"enter first int"<<endl;
   cin>>a;
   cout<<"enter second int"<<endl;
   cin>>b;

   if (a==b)
   {
    cout<<"integer are equals" <<endl;
   }
   else {
    cout<<"integer are not  equals" <<endl;
   }

return 0;}
```

```
output:
enter   two integers and check whether they are equal or not.
enter first int
40
enter second int
50
integer are not  equals
```

13. to detrermine a candidate's age is eligible for casting the vote or not.

```cpp
#include <iostream>
using namespace std;
int main(){
    int a;
    cout<<"enter your age "<<endl;
    cin>>a;

    if (a>=18)
    {
        cout<<"you can vote"<<endl;
    }

    else{
        cout<<"you cannot vote";
    }

return 0;}
```
output:
```
enter your age
18
you can vote
```

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

int main(){
    int a;
    cout<<"enter your age "<<endl;
    cin>>a;

    if (a<18)
    {
        cout<<"you cannot vote"<<endl;
        cout<<"you can vote after " <<18-a <<" years" <<endl;
    }
    else{
        cout<<"you cann vote";
    } return 0;}
```
output:
```
enter your age
14
you cannot vote
you can vote after 4 years
```

14. to find the eligibility of admission for an engineering course based on the criteria.

Marks in Maths >=65

Marks in Phy >=55

Marks in Chem>=50

Total in all three subject >=180

or

Total in Math and Subjects >=140

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

int main(){
  int maths , phy , chem , total ,maths_phy_total, maths_chem_total ;

cout<<"enter your marks in maths " <<endl;
cin>>maths;
cout<<"enter your marks in phy " <<endl;
cin>>phy;
cout<<"enter your marks in chem " <<endl;
cin>>chem;

total=maths+phy+chem;

maths_phy_total=maths+phy;
maths_chem_total=maths+chem;

cout<<"all three subject total : "<<total <<endl;
cout<<"all maths + phy (140) total : "<<maths_phy_total <<endl;
cout<<"all maths + chem( 140) total : "<<maths_chem_total <<endl;

if (maths>=65 && phy>=55 && chem>=50)
{
    if (total>=180)
    {
        cout<<"you are eligiabil total of maths phy chem is above 180 : " <<total
<<endl;
    }

}
```

```cpp
    else if (maths_phy_total>=140 ){
        cout<<"you are eligiabil  maths + phy  : " <<maths_phy_total <<endl;

    }
    else if (maths_chem_total>=140 ){
        cout<<"you are eligiabil maths + chem : " <<maths_chem_total <<endl;

    }

    else{
        cout<<"you are not eligiable";
    }

    return 0;}
```

OUTPUT :

enter your marks in maths

17

enter your marks in phy

15

enter your marks in chem

70

all three subject total : 102

all maths + phy (140) total : 32

all maths + chem(140) total : 87

you are not eligiable

15. calculate the total marks, percentage and division of student.

```cpp
#include <iostream>
using namespace std;
int main(){

string name;
int physics , chem , maths , IT , total ;
float percentage ;
cout<<"Enter Your Name" <<endl;
getline(cin,name);

cout<<"Enter number of  physics , chem , maths , IT in sequence  " <<endl;
cin>>physics >>chem >>maths >>IT ;
total=physics + chem + maths + IT;
percentage=total/4.0;

if (percentage>=60  )
{
    cout<<"first division" <<endl;
}
else if (percentage <60 || percentage>=45)
{
    cout<<"second division" <<endl;

}

else if(percentage<45 || percentage>=35){
        cout<<"third division" <<endl;

}
else{
    cout<<"you are fail " <<endl;
 }

cout<<"your name is : " <<name <<endl;
cout<<"number in physics : " <<physics <<endl;
cout<<"number in chem : " <<chem <<endl;
cout<<"number in it : " <<IT <<endl;
cout<<"total marks : " <<total <<endl;
cout<<"your percentage is :" <<percentage <<endl;

    return 0;
}
```

anothrt way

```cpp
#include<iostream>
#include<string.h>
using namespace std;
int main()
{    int rollno, phy, che, it, total;
    float percentage;
    char name[20], div[10];

    cout << "Input the Roll Number of the student :";
    cin >> rollno;

    cout << "Input the Name of the Student :";
    cin >> name;

    cout << "Input the marks of Physics, Chemistry and Information Technology: ";
    cin >> phy >> che >> it;

    total = phy + che + it;
    percentage = total/3.0;

    if (percentage >= 60)
    strcpy(div, "First");

    else
    if (percentage < 60 && percentage >= 48)
        strcpy(div,"Second");

    else
        if (percentage <48 && percentage >= 36)
        strcpy(div, "Pass");

         else
        strcpy(div, "Fail");

        cout << "Roll No : " << rollno <<endl << "Name of Student : " << name
<<endl;

        cout << "Marks in Physics : " << phy << endl;
        cout << "Marks in Chemistry : " << che << endl;
        cout << "Marks in Information Technology : " << it << endl;
        cout << "Total Marks = " << total <<endl;
        cout << "Percentage = " << percentage <<endl;
        cout << "Division = " << div <<endl }
```

16. enter month number and print number of days in month.

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

int main(){

    int month;

    cout<<"enter month number (1-12)" <<endl;
    cin>>month;

    if (month==1)
    {
      cout<<"january";
    }

    else if (month==2)
    {
      cout<<"feb";
    }
      else if (month==3)
    {
      cout<<"mar";
    }

      else if (month==4)
    {
      cout<<"april";
    }

      else if (month==5)
    {
      cout<<"may";
    }

      else if (month==6)
    {
      cout<<"june";
    }

      else if (month==7)
    {
      cout<<"june";
    }
```

```cpp
        else if (month==8)
      {
        cout<<"aug";
      }

        else if (month==9)
      {
        cout<<"sep";
      }

        else if (month==10)
      {
        cout<<"oct";
      }
        else if (month==11)
      {
        cout<<"nov";
      }
        else if (month==12)
      {
        cout<<"dec";
      }

      else{
        cout<<"invalid number";
      }


    return 0;
}
output:
enter month number (1-12)
15
invalid number
```

17.to count total number of notes in entered amount.

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

int main()
{
    int amount;

    int note1, note2, note5, note10, note20, note50, note100, note500;

    note1 = note2 = note5 = note10 = note20 = note50 = note100 = note500 = 0;

    cout << "Enter amount: "<<endl;
    cin >> amount;

    if(amount >= 500)
    {
        note500 = amount/500;
        amount -= note500 * 500;
    }
    if(amount >= 100)
    {
        note100 = amount/100;
        amount -= note100 * 100;
    }
    if(amount >= 50)
    {
        note50 = amount/50;
        amount -= note50 * 50;
    }
    if(amount >= 20)
    {
        note20 = amount/20;
        amount -= note20 * 20;
    }
    if(amount >= 10)
    {
        note10 = amount/10;
        amount -= note10 * 10;
    }
    if(amount >= 5)
    {
        note5 = amount/5;
        amount -= note5 * 5;
```

```cpp
    }
    if(amount >= 2)
    {
        note2 = amount /2;
        amount -= note2 * 2;
    }
    if(amount >= 1)
    {
        note1 = amount;
    }

    cout << "Total number of notes" <<endl;
    cout << "500 = " << note500 <<endl;
    cout << "100 = " << note100 <<endl;
    cout << "50 = " << note50 <<endl;
    cout << "20 = " << note20 <<endl;
    cout << "10 = " << note10 <<endl;
    cout << "5 = " << note5 <<endl;
    cout << "2 = " << note2 <<endl;
    cout << "1 = " << note1 <<endl;

    return 0;}
```
OUTPUT:
Enter amount:
500
Total number of notes
500 = 1
100 = 0
50 = 0
20 = 0
10 = 0
5 = 0
2 = 0
1 = 0

18. check whether a triangle can be formed by the given value for the angles.

what is triangle
the sum of 3 angle is 180 degree;

```cpp
#include <iostream>
using namespace std;
int main (){

 int a,b,c,total;
 cout<<"enter first angle of triangle : " <<endl;
 cin>>a;
  cout<<"enter second angle of triangle : " <<endl;
 cin>>b;
  cout<<"enter third angle of triangle : " <<endl;
 cin>>c;

 total = a+b+c;
 if (total==180)
 {
    cout<<"triangle can formed";
 }

 else{
    cout<<"triangle cannot formed";
 }
    return 0;
}
```
OUTPUT:

enter first angle of triangle :

60

enter second angle of triangle :

60

enter third angle of triangle :

60

triangle can formed

LOOP

01.to print alphabets from a to z

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

int main(){
    for (char i = 'a'; i <= 'z'; i++)
    {
        cout<<i<<" ";
    }
     return 0;
}
```
output:
a b c d e f g h i j k l m n o p q r s t u v w x y z

02. Write C++ program to print ASCII values of all characters

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

int main(){

    char i;
    for ( i = 'a'; i <= 'z'; i++)
    {
        cout<<"ASCII value of  : "<<i <<" = " <<int(i) <<endl ;
    }

    for ( i = 'A'; i <= 'Z'; i++)
    {
        cout<<"ASCII value of  : "<<i <<" = " <<int(i) <<endl ;
    }
 return 0;}
```

OUTPUT:
ASCII value of : a = 97
ASCII value of : b = 98
ASCII value of : c = 99
ASCII value of : d = 100
ASCII value of : e = 101
ASCII value of : f = 102
ASCII value of : g = 103

```
ASCII value of  : h = 104
ASCII value of  : i = 105
ASCII value of  : j = 106
ASCII value of  : k = 107
ASCII value of  : l = 108
ASCII value of  : m = 109
ASCII value of  : n = 110
ASCII value of  : o = 111
ASCII value of  : p = 112
ASCII value of  : q = 113
ASCII value of  : r = 114
ASCII value of  : s = 115
ASCII value of  : t = 116
ASCII value of  : u = 117
ASCII value of  : v = 118
ASCII value of  : w = 119
ASCII value of  : x = 120
ASCII value of  : y = 121
ASCII value of  : z = 122
ASCII value of  : A = 65
ASCII value of  : B = 66
ASCII value of  : C = 67
ASCII value of  : D = 68
ASCII value of  : E = 69
ASCII value of  : F = 70
ASCII value of  : G = 71
ASCII value of  : H = 72
ASCII value of  : I = 73
ASCII value of  : J = 74
ASCII value of  : K = 75
ASCII value of  : L = 76
ASCII value of  : M = 77
ASCII value of  : N = 78
ASCII value of  : O = 79
ASCII value of  : P = 80
ASCII value of  : Q = 81
ASCII value of  : R = 82
ASCII value of  : S = 83
ASCII value of  : T = 84
ASCII value of  : U = 85
ASCII value of  : V = 86
ASCII value of  : W = 87
ASCII value of  : X = 88
ASCII value of  : Y = 89
ASCII value of  : Z = 90
```

03. print multiplication table of a given number

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

int main(){

int a ,i;
cout<<"Enter your number for table" <<endl;
cin>>a;

for ( i = 1 ; i <= 10 ; i++)
{
    cout<<a <<" x " <<i <<" = " <<i*a <<endl;
}

return 0;

}
output:
Enter your number for table
2
2 x 1 = 2
2 x 2 = 4
2 x 3 = 6
2 x 4 = 8
2 x 5 = 10
2 x 6 = 12
2 x 7 = 14
2 x 8 = 16
2 x 9 = 18
2 x 10 = 20
```

04.print all natural numbers in reverse order

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

int main(){
    int a ,i;
    cout<<"enter number " <<endl;
    cin>>a;

    for ( i = a; i >=1 ; i--)
    {
        cout<<i <<endl;
    }

    return 0;
}
```

output:
enter number
10
10
9
8
7
6
5
4
3
2
1

05. find sum of even numbers between 1 to n

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

int main()
{
    int a ,i,sum=0;
    cout<<"enter your number " <<endl;
    cin>>a;
    for ( i = 2; i <= a; i+=2)
    {
       sum +=i;
    }
cout<<sum;



return 0;
}
```

06. find sum of odd numbers between 1 to n

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

int main()
{
    int a ,i,sum=0;
    cout<<"enter your number " <<endl;
    cin>>a;
    for ( i = 1; i <= a; i+=2)
    {
       sum +=i;
    }
cout<<sum;
    return 0;
}
enter your number
10
25
```

07.reverse a number using while & for loop

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

int main(){
  int input_number ,reminder,reverse=0;
  cout<<"enter your number to reverse"<<endl;
cin>>input_number;

while (input_number !=0)
{   reminder=input_number%10;
    reverse=reverse*10+reminder;
    input_number=input_number/10;
  }
  cout<<"Reverse number is : " <<reverse;

    return 0;
}
```

```
output:
enter your number to reverse
123456
Reverse number is : 654321
```

```
reverse code explain :
1.first we take a number example 1234
2.than we divide the number 1234 by 10 and reminder save in reminder variable
using modul % (the reminder is 4).
3.than we find reverse value using reminder value number using
formula  reverse=reverse*10+reminder; (reverse value is 4)
4.now we have to remove last digit of our number 123[4] .
5.we use formula   input_number=input_number/10;   1234/10 =123.4 the valriable
is int it will remove .4
6.now our number is 123 .
7.this conntinue untill complete reverse.
```

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

int main(){
 int number ,reminder,reverse=0;
 cout<<"enter your number to reverse"<<endl;
 cin>>number;
  for ( ; number!=0 ; number=number/10 )
  {   reminder=number %10;
     reverse=reverse*10+reminder;


  }
  cout<<reverse;

return  0;}
```

08. calculate power using while & for loop

Exponentiation is a mathematical operation, written as b^n, involving two numbers,
the base b and the exponent or power n, and pronounced as "b to the n".
5 ki power 3 = 5*5*5 =125

using for loop

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

int main(){

  int number , power=1 , exponent;

  cout<<"enter your number" <<endl;
  cin>>number;
  cout<<"enter your exponent" <<endl;
  cin>>exponent;

for (int  i = 1; i <= exponent ; i++)
{
    power=power*number;
}
cout<<power;
}
```

```cpp
#include <iostream>
using namespace std;
int main(){

        int number , power=1 , exponent ,i=1;

   cout<<"Enter your number" <<endl;
   cin>>number;
   cout<<"Enter your exponent" <<endl;
   cin>>exponent;


   while (i<=exponent)
   {
     power=power*number;
    i=i+1;
   }
cout<<power;
   return 0;}
```

output:
enter your number
5
enter your exponent
3
125

09. to find factorial of any number

Factorial Symbol
The factorial function (symbol: !) says to multiply all whole numbers from our
chosen number down to 1.

Examples:

4! = 4 × 3 × 2 × 1 = 24
7! = 7 × 6 × 5 × 4 × 3 × 2 × 1 = 5040
1! = 1

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

int main(){
      int nummber , fact=1 , i=1;

      cout<<"enter your number :" <<endl;
      cin>>nummber;

      for ( i = 1; i <= nummber; i++)
      {
         fact=fact*i;
      }

      cout<<"factorial of : " <<nummber <<" is = "<<fact;
 return 0;
}
```

output;
enter your number :
4
factorial of : 4 is = 24

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

int main(){
    int nummber , fact=1 , i=1;
        cout<<"enter your number :" <<endl;
      cin>>nummber;

     while (i<=nummber)
     {
      fact=fact*i;
      i++;
     }

   cout<<"factorial of : " <<nummber <<" is = "<<fact;
    }

    output:
    enter your number :
4
factorial of : 4 is = 24
```

10.check a number is Armstrong number or not

Narcissistic Number or armstrong number .
An n-digit number that is the sum of the nth powers of its digits is called an n-narcissistic number. It is also sometimes known as an Armstrong number.

An Armstrong number of three digits is **an integer such that the sum of the cubes of its digits is equal to the number itself**. For example, 371 is an Armstrong number since 3**3 + 7**3 + 1**3 = 371.

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

int main(){
  int number , reminder, sum=0 , temp;

  cout<<"enter your number to check it is armstrong or not : " <<endl ;
   cin>>number;
   temp=number;

   while (number>0)
   {
    reminder=number%10;
    sum=sum+(reminder*reminder*reminder);
    number=number/10;

   }

   if (temp==sum)
   {
    cout<<"armstrong";
   }
   else{
    cout<<"not armstrong";
   }

   return 0;
}
```

output:
enter your number to check it is armstrong or not :
153
armstrong

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

int main(){
    int number , reminder, sum=0 , temp ,i;

    cout<<"enter your number to check it is armstrong or not : " <<endl ;
    cin>>number;
    temp=number;

    for ( i = 0 ; i < number; number=number/10)
    {
        reminder=number%10;
        sum=sum+(reminder*reminder*reminder);

    }

    if (temp==sum)
    {
     cout<<"armstrong";
    }
    else{
     cout<<"not armstrong";
    }

    return 0;
}
```

11. Fibonacci series?

The Fibonacci sequence is a type series where each number is the sum of the two that precede it. It starts from 0 and 1 usually. The Fibonacci sequence is given by 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, and so on. The numbers in the Fibonacci sequence are also called Fibonacci numbers.

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

int main(){
int t1 ,t2 ,t3 ,input_times ;
 t1=0;
 t2=1;
 cout<<"Enter your number n number of time you want  " <<endl;
 cin>>input_times;
 cout<<t1 <<"\t" <<t2 <<"\t" ;

for (int i = 2; i < input_times ; i++)
{
    t3=t1+t2;
    cout<<t3 <<"\t";
    t1=t2;
    t2=t3;

}
return 0;

}
output:
Enter your number n number of time you want
10
0       1       1       2       3       5       8       13      21      34
```

---

12. check a number is Prime number or not using while loop

Prime number is a number that can be divided exactly only by itself and 1, for example 7, 17 and 41

a prime number has to factor 1 or itself means two factor composite number has more than two factor .
1 is neither prime nor composite

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

int main(){
    int input ,count=0;
     cout<<"enter a number to check a number  is prime or not "<<endl;
     cin>>input;

     for (int  i = 1; i <= input; i++)
     {
         if (input%i==0)
         {
             count++;                                    //count++
         }

     }

     if (count==2)
     {
         cout<<"number is prime";
     }
     else{
         cout<<"number is not prime";
     }
     return 0;
}
```

EXPLAIN

we made input variable to input a number .
we made count variable to count factor coz prime number have only two factor
intial value or count is 0.

for example we input a number 3
(int i = 1; i <= input; i++)=
(int i = 1; 1 <= 3; i++)-
intial value of i is one so the loop start from one .
1 is less than or equal to 3 condtion is true so loop start.

it will go in if condtion now if (input%i==0) if (3%1==0)
(3%1==0) % is used to find remainder (0==0) condition true .
so our condition is true it the count value increase to 1 .

than it will again go to loop .

(int i = 1; 2 <= 3; i++)-
2 is less than or equal to 3 condtion is true so loop start.

it will go in if condtion now if (input%i==0) if (3%2==0)
(3%2==0) % is used to find remainder (1==0) condition false .
so our condition is false ,the count value not increase is still 1 .

than it will again go to loop .

(int i = 1; 3 <= 3; i++)-
3 is less than or equal to 3 condtion is true so loop start.

it will go in if condtion now if (input%i==0) if (3%2==0)
(3%3==0) % is used to find remainder (0==0) condition true .
so our condition is true ,the count value increase by 1 ,now count value is 2 .

than it will again go to loop .
(int i = 1; 4 <= 3; i++)- condition false loop will not execute .

it will come to if (count==2) condtion
our count value is 2 so this condition is true
cout<<"number is prime" will execute.

```cpp
using while loop
#include <iostream>
using namespace std;

int main(){

    int input,count=0 ,i=1;
    cout<<"enter a number to check its prime or not" <<endl;
    cin>>input;
     while (i<=input)
     {
        if (input%i==0)
        {
            count++;
        }

        i++;
     }

     if (count==2)
     {
        cout<<"prime number";
     }
     else{
        cout<<"not a prime number";
     }

    return 0;
}
```

13. check a number is palindrome or not

A palindromic number (also known as a numeral palindrome or a numeric palindrome) is a number (such as 16461) that remains the same when its digits are reversed. In other words, it has reflectional symmetry across a vertical axis.

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

int main(){
  int input , remainder  , reverser , sum =0;
  cout<<"enter number"<<endl;
  cin>>input;
  reverser=input;

  while (input>0)
  {
     remainder=input%10;
     sum=remainder+(sum*10);
     input=input/10;
   }
  if (reverser==sum)

  {
    cout<<"palindrome";
  }

  else{
    cout<<"not palindrome";
  }
    return 0;
}
```

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

int main(){
  int input , remainder  , reverser , sum =0;
  cout<<"enter number"<<endl;
  cin>>input;
  reverser=input;
for (int i = 0; input > 0 ;input=input/10 )
{ remainder=input%10;
    sum=remainder+(sum*10);

}

  if (reverser==sum)

  {
    cout<<"palindrome";
  }

  else{
    cout<<"not palindrome";
  }
    return 0;
}


for example 121
first we find remainder of input number .
than store in variable
formula -(sum=0) sum=remainder+(sum*10)
than remove last value of input
formula input = input/10;
```

14. HCF calculation - HCF Definition

The full form of HCF in Maths is Highest Common Factor.

As the rules of mathematics dictate, the greatest common divisor or the gcd of two or more positive integers happens to be the largest positive integer that divides the numbers without leaving a remainder. For example, take 8 and 12. The H.C.F. of 8 and 12 will be 4 because the highest number that can divide both 8 and 12 is 4.

```cpp
#include <iostream>

using namespace std;

int main()
{
    int i, num1, num2, min, HCF=1;

    //Read two numbers from user
    cout<<"Enter any two numbers:";
    cin>>num1;
    cin>>num2;

    // Find min number between two numbers
    min = (num1<num2) ? num1 : num2;

    for(i=1; i<=min; i++)
    {
        if(num1%i==0 && num2%i==0)
        {
            HCF = i;


        }
        cout<<HCF<<endl;;
    }

    cout<<"HCF of "<<num1<< " and "<< num2<< " is: " <<HCF;
    return 0;

}
```

```
output:
Enter any two numbers:12
6
1
2
3
3
3
6
HCF of 12 and 6 is: 6
```

explaNAtion

```
 min = (num1<num2) ? num1 : num2;
  min = (12<6) ? 12 : 6;
  12 is less than 6 conditon is false so 6 is min
  min=6

  for(i=1; i<=min; i++) = for(i=1; i<=6; i++)

 1 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%1==0 && 6%1==0)
 hcf=i haf=1;


 2 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%2==0 && 6%2==0)
 hcf=i haf=2;

  3 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%3==0 && 6%3==0)
 hcf=i haf=3;

 4 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%4==0 && 6%4==0)
 hcf=i haf=3;

  5 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%5==0 && 6%5==0)
 hcf=i haf=3;

  6 is less than or equal to 6 condition is true loop will exectue .
 if(num1%i==0 && num2%i==0) = if(12%6==0 && 6%6==0)
 hcf=i haf=6;
hcf of 12 and 6 is 6
```

you can also write this code ANOTHER WAY

```cpp
#include <iostream>

using namespace std;

int main()
{
    int i, num1, num2, min, HCF=1;

    //Read two numbers from user
    cout<<"Enter any two numbers:";
    cin>>num1;
    cin>>num2;

    // Find min number between two numbers
    // min = (num1<num2) ? num1 : num2;

    for(i=1; i<=num1; i++)
    {
        if(num1%i==0 && num2%i==0)
        {
            HCF = i;


        }
        cout<<HCF<<endl;;
    }

    cout<<"HCF of "<<num1<< " and "<< num2<< " is: " <<HCF;
    return 0;

}

output:
Enter any two numbers:32
12
1
2
2
4
4
4
4
4
4
```

```
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
4
HCF of 32 and 12 is: 4
```

another way

```
// a=39;b=12
```

the bigger number excute only

```
a=a-b ; b=b-a
a=39-12 ;b=12
a=27    ;b=12

a=a-b ; b=b-a
a=27-12 ; b=12
a=15 ;b=12
a=a-b ; b=b-a
a=15-12 ;b=12
a=3; b;12

a=a-b ; b=b-a
b=12-3 ; a=3
b=9 ; a=3
b=9-3 ;a=3
b=6 ;a=3
b=6-3 ;a=3
b=3 ; a=3
```

hcf of 12 and 27 is 3

```cpp
#include <iostream>
using namespace std;
int main(){ int num1,num2;
    cin>>num1;
    cin>>num2;
    while (num1!=num2)
    {
        if (num1>num2)
        {
            num1=num1-num2;

        }
        else{
            num2=num2-num1;

        } }
    cout<<num1;            //you can also print num2
    cout<<num2; }
```

15.FIND LCM OF TWO NUMBER

LCM is the short form for "Least Common Multiple." The least common multiple is defined as the smallest multiple that two or more numbers have in common.

For example: Take two integers, 2 and 3.

Multiples of 2: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20….

Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 ….

6, 12, and 18 are common multiples of 2 and 3. The number 6 is the smallest. Therefore, 6 is the least common multiple of 2 and 3.

So, what is LCM in math? The LCM of two numbers is the smallest number divisible by both numbers.

TO find the Lcm , we have to find hcf first .
formula
lcm x hcf = a x b .
lcm= (axb)hcf.

```cpp
#include <iostream>
using namespace std;
int main(){

    int a ,b ,lcm,hcf,x,y;
    cout<<"enter A number " <<endl;
    cin>>a;
    cout<<"enter B number " <<endl;
    cin>>b;
    x=a;
    y=b;

    while (a!=b)
    {
        if (a>b)
        {
            a=a-b;
        }

        else{
            b=b-a;
        }

    }
  hcf=a;               //you can also write b .
  lcm=(x*y)/hcf;
 cout<<lcm;


}
```

Star pattern

01.Right Triangle Star Pattern

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

int main(){

int a;
cout<<"enter raw number : ";
cin>>a;

for (int i = 1; i <= a; i++)          // raw
{
    for (int j = 1; j <= i; j++)      //column
    {
        cout<<" * ";
    }
    cout<<"\n";

}
return 0;

}
```

output:
enter raw number : 5

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

02.inverted half star pyramid pattern (Downward Triangle Star Pattern)

```cpp
#include <iostream>
using namespace std;
int main(){
int a;
cout<<"enter raw number : ";
cin>>a;
for (int i = 0; i < a; i++) // first loop  raw
{
  for (int j = a; j >i; j--) // second loop columns
  {
    cout<<" * ";
  }
    cout<<"\n";}}
```

1.Enter a number for example we enter 3 . a=3.
first loop will , for(int i=0;i<3;i++) ,the initial value
of i is 0 (i=0) , i < a (0 < 3) zero is less than three
condition true .
Enter in second loop where for(int j =a ; j >i ; j--) ,
for(int j =3 ; j >0 ; j--) , the value of j is 3 , j>0 (
3 > 0) 3 is bigger than zero condition true loop execute ,
cout << " * " will print ,
than j-- decrement means now the value of j will decrease
j < i (2 > 0) two is bigger than zero this condition is
also true the cout<< " *" will execute . this goes untill
the second loop contion become false

output:
enter raw number : 3
 * * *
 * *
 *

```cpp
#include <iostream>
using namespace std;
int main()
{
 int a;
 cout<<"enter row number : ";
 cin>>a;
 for (int i = 1; i <= a; i++)            //    raw
    {
    for (int j =i; j <a; j++)          // space
     {
    cout<<" ";
     }
    for (int k = 1; k <= i; k++)         // column
    {
        cout<<"*";
    }

    cout<<"\n";
    }
}
```

```
 enter row number : 4
    *
   **
  ***
 ****
```

Explanation

to give space in pyramid three for loop used.

we take a =4 input from user

raw loop = for (int i = 1; i <= a; i++) = (int i = 1; 1 <= 4; i++)
intial point is i = 1 , 1 is less than or equal to 4 condition true
,went to second loop

second loop is used to give space = for (int j =i; j <a; j++)= (int j =1; j <4; j++)
      j=i means j = 1 , j <a means 1 < 4 , condition true
      cout<<" "; execute one time one space made ,
than j++ increment = j <a means 2 < 4   condition true
      cout<<" "; execute second time second space made ,

than j++ increment = j <a means 3 < 4   condition true
      cout<<" "; execute second time third space made ,
 than j++ increment = j <a means 4 < 4 four is less than
four   condition fALSE
      cout<<" "; NOT execute .

IT COMES TO THIRD FOR LOOP   for (int k = 1; k <= i; k++) = for (int k = 1; k <= 1; k++)
 INITIAL start k =1 , k<=i means 1 is less than or equal to 1 conditon
true
      cout<<"*"; will execute ,
k++ increament
k<=1 (2<=1) condtion false ,

 cout<<"\n"; will execute .

than again come to first loop . this will continue untill the first
loop condition become false

04.Right down Mirror Star Pattern

```cpp
#include <iostream>
using namespace std;
int main()
{
 int a;
 cout<<"enter raw number : ";
 cin>>a;
 for (int i = 1; i <= a; i++)              //   raw
    {
    for (int j =1; j <i; j++)           // space
     {
    cout<<" ";
     }
    for (int k = i; k <= a; k++)           // column
    {
        cout<<"*";
    }

    cout<<"\n";
    }
}
enter raw number : 5
*****
 ****
  ***
   **
    *
```

```
input 3 a=3
first for loop for raw =
for (int i = 1; i <= a; i++) = (int i = 1; i <= 3; i++)
initial i =1 ,
i<=a = (1<=3 ) one is less than or equal to three condition true
it will go to second loop
second for loop
for (int j =1; j <i; j++) = (int j =1; j <1; j++)
j < 1 ( one is less than one ) condition false,
cout<<" "; not execute
third loop
for (int k = i; k <= a; k++)=(int k = 1; 1 <= 3; k++)
1 <= 3 ( one is less than or equal to three ) conditionn true
 cout<<"*" will execute .
 than k++ increment ,
 again come to third loop (int k = 1; 2 <= 3; k++)
 2<=3 ( two is less than or equal to three) condition true
 cout<<"*" will execute .
 than k++ increment ,
 again come to third loop (int k = 1; 3 <= 3; k++)
 3<=3 ( three is less than or equal to three) condition true
 cout<<"*" will execute .
 than k++ increment
  again come to third loop (int k = 1; 4 <= 3; k++)
 4<=3 ( four is less than or equal to three) condition false
 cout<<"*" will not execute .

than again come to first loop
first for loop for raw =
for (int i = 1; i <= a; i++) = (int i = 1; 2 <= 3; i++)
now i = 2 ,
i<=a = (2<=3 )  is two less than or equal to three condition true
it will go to second loop

second for loop
for (int j =1; j <i; j++) = (int j =1; j <2; j++)
j=1 , j<2 (1 < 2) ( one is less than two ) condition true,
cout<<" "; will execute

again second loop
for (int j =1; j <i; j++) = (int j =1; 2 <2; j++)
j=1 , 2<2  ( two is less than two ) condition false,
cout<<" "; will not execute

came to third loop .
```

SWITCH CASE

01. print number of days in a month using switch case

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

int main (){
 int month_day;

 cout<<"Enter a month number to find  how many days it has " <<endl;
 cin>>month_day;

 switch (month_day)
 {
 case 1:
 cout<<"you enter 1 ,january have 31 days";
break;

case 2:
 cout<<"you enter 2 ,feb have 28 days";
break;
 case 3:
 cout<<"you enter 3 ,mar have 30 days";
break;
 case 4:
 cout<<"you enter 4 ,april have 31 days";
break;
 case 5:
 cout<<"you enter 5 ,may have 30 days";
break;
 case 6:
 cout<<"you enter 6 ,june have 30 days";
break;
 case 7:
 cout<<"you enter 7 ,july have 31 days";
break;
 case 8:
 cout<<"you enter 8 ,aug have 31 days";
break;
 case 9:
 cout<<"you enter 9 sep have 30 days";
break;
 case 10:
```

```cpp
 cout<<"you enter 10 ,oct have 31 days";
break;
 case 11:
 cout<<"you enter 11 ,nov have 30 days";
break;
 case 12:
 cout<<"you enter 12 ,dec have 31 days";
break;




 default:
 cout<<"enter wrong month number";
    break;
 }

}
output:
Enter a month number to find  how many days it has
12
you enter 12 ,dec have 31 days
```

02. create simple calculator using switch Statement

```cpp
#include <iostream>
using namespace std;
int main (){
    char maths_operator;
    int num1 , num2;

    cout<<"what you want to do  (+  , - , * , / )" <<endl;
    cin>>maths_operator;

    cout<<"enter num1"<<endl;
    cin>>num1;

    cout<<"enter num2"<<endl;
    cin>>num2;

switch (maths_operator)
{
case '+' :
cout<<num1+num2;
    break;

case '-' :
cout<<num1-num2;
    break;

case '/' :
cout<<num1/num2;
    break;

case '*' :
cout<<num1*num2;
    break;
default:
cout<<"enter correct operator";
    break;  }}
output:
what you want to do  (+  , - , * , / )
+
enter num1
40
enter num2
40
80
```

03. check even or odd number using switch case

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

int main (){
 int  a ;
 cout<<"enter a number to check it is even or odd "<<endl;
 cin>>a;
switch (a%2)
{
case 0:
    cout<<"number is even";
    break;
  case 1:
    cout<<"number is odd";
    break;
default:
cout<<"enter correct number";
    break;
}
}

enter a number to check it is even or odd
14
number is even
```

04. check vowel or consonant using switch case

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

int main (){
 char  a ;
  cout<<"enter a alphabet"<<endl;
  cin>>a;
  switch (a)
  {
  case 'a':
  case 'e':
  case 'i':
  case 'o':
  case 'u':
  case 'A':
  case 'E':
  case 'I':
  case 'O':
  case 'U':
    cout<<"vowel";
    break;

  default:
  cout<<"consonant";
    break;
  }}
```

OUTPUT:
```
enter a alphabet
Z
consonant
```

05. print gender Male Female program

```cpp
#include <iostream>

using namespace std;

int main(){

    char gender;

    //Reading gender from user
    cout<<"Enter gender (M/m or F/f): ";
    cin>>gender;

    switch(gender)
    {
        case 'M':
        case 'm':
            cout<<"Male";
            break;
        case 'F':
        case 'f':
            cout<<"Female";
            break;
        default:
            cout<<"Unspecified Gender"<<endl;
    }

    return 0;

}
```

06.find maximum number using switch case

```cpp
#include <iostream>

using namespace std;

int main(){

    int num1, num2;

    //Reading two numbers from user
    cout<<"Enter two numbers to find maximum number: ";
    cin>>num1;
    cin>>num2;

    //Condition to check maximum number
    switch(num1 > num2)
    {
        case 0: cout<<num2<<" is Maximum number";          //0(FALSE)
            break;

        case 1: cout<<num1<<" is Maximum number";          //1(TRUE)
            break;
    }

    return 0;

}
```

ARRAY

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

int main (){
    string car[4];
    cin>>car[0];
    cin>>car[1];
    cin>>car[2];
    cin>>car[3];
    cout<<car[0] <<" " <<car[1]<<" "  <<car[2]<<" "  <<car[3];
}
```
OUTPUT:
AMARTH
PATEL
LUCKY
PATEL
AMARTH PATEL LUCKY PATEL

```cpp
#include <iostream>
using namespace std;
int main (){
    int number[]={1,2,3,4};
    cout<<number[0];
}
```
output:
1

```cpp
#include <iostream>
using namespace std;
int main (){
    int number[]={1,2,3,4};
    number[0]={100};
    cout<<number[0];
}
```
output:
100

01.enter array value through for loop

```cpp
#include <iostream>
using namespace std;
int main (){

int x[5];
for (int i = 0; i < 5; i++)
{
    cout<<"enter array value " <<i
<<":";
    cin>>x[i];
}

for (int i = 0; i < 5; i++)
{
    cout<<"value of cell "<<i<<":";
    cout<<x[i] <<endl;
}

}

output:
enter array value 0:00
enter array value 1:10
enter array value 2:20
enter array value 3:30
enter array value 4:40
value of cell 0:0
value of cell 1:10
value of cell 2:20
value of cell 3:30
value of cell 4:40
```

another way

```cpp
#include <iostream>
using namespace std;
int main (){

int x[5];
for (int i = 0; i < 5; i++)
{
    cout<<"enter array value " <<i
<<":";
    cin>>x[i];

    cout<<"value of cell
"<<i<<":";
    cout<<x[i] <<endl;
      cout<<endl;
}

}

output:
enter array value 0:00
value of cell 0:0

enter array value 1:10
value of cell 1:10

enter array value 2:20
value of cell 2:20

enter array value 3:30
value of cell 3:30

enter array value 4:40
value of cell 4:40
```

02.loop through a array

```cpp
#include <iostream>
using namespace std;
int main (){

    string car[]={"BMW" , "AUDI" , "TATA ","SUZUKI"};

    for (int i = 0; i < 4 ; i++)
    {
        cout<<"index" <<" = " <<i <<" : " <<car[i] <<endl;;
    }
}

output:
index = 0 : BMW
index = 1 : AUDI
index = 2 : TATA
index = 3 : SUZUKI
```

```cpp
#include <iostream>
using namespace std;
int main (){

    int number[4]={11 , 22 , 33 , 44};

    for (int i = 0; i < 4 ; i++)
    {
        cout<<"index" <<" = " <<i <<" : " <<number[i] <<endl;;
    }
}

// output:
index = 0 : 11
index = 1 : 22
index = 2 : 33
index = 3 : 44
```

03.sizeof() array , and loop

```cpp
#include <iostream>
using namespace std;
int main (){

    int number[]={01 , 02 , 03 , 04 ,05};
     cout<<sizeof(number);


}
output : 20   coz   ( 1 int store in 4 byte = 4*5=20)
```

```cpp
#include <iostream>
using namespace std;
int main (){

    int number[]={01 , 02 , 03 , 04 ,05};
     cout<<"size of array is = " <<sizeof(number)/sizeof(int);


}
output: size of array is = 5
```

```cpp
#include <iostream>
using namespace std;
int main (){

    int number[]={11 , 22 , 33 , 44 ,55};
     for (int i = 0; i < sizeof(number)/sizeof(int); i++)
     {
         cout<<"index "<<i <<" = " <<number[i] <<endl;
         }
}

output:
index 0 = 11
index 1 = 22
index 2 = 33
index 3 = 44
index 4 = 55
```

04. for each loop in array

```cpp
#include <iostream>
using namespace std;
int main (){
    int number[]={11 , 22 , 33 , 44 ,55};
     for (int i :number)
     {
         cout<<i <<"\n";
         }
}
output:
11
22
33
44
55
```

05.2d array

```cpp
#include <iostream>
using namespace std;
int main (){

    int number[2][2]={
                      {11,22},
                      {33,44}
                 };

cout<<number[0][0];              //output :11
cout<<number[0][1];               //output :22
cout<<number[1][0];             //output :33
cout<<number[1][1];              //output :44
}
```

06. 3d array or multi dimenational

```cpp
#include <iostream>
using namespace std;
int main (){

int ay[2][2][2]{
                {
                 {11,22},
                    {33,44}
                },
                  {
                     {55,66},
                      {77,88}
                   }
            };

cout<<ay[0][0][0] <<endl;    //output :11
cout<<ay[0][0][1] <<endl;    //output :22
cout<<ay[0][1][0] <<endl;    //output :33
cout<<ay[0][1][1] <<endl;    //output :44
cout<<ay[1][0][0] <<endl;    //output :55
cout<<ay[1][0][1] <<endl;    //output :66
cout<<ay[1][1][0] <<endl;    //output :77
cout<<ay[1][1][1] <<endl;    //output :88
```

07.loop through 2d array .

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

  int main(){
    int number[2][4]={ {1,2,3,4},{5,6,7,8}   };

      for(int i=0 ;i < 2;i++)
      {
          for (int j = 0; j < 4; j++)
          {
              cout<<number[i][j] <<"\n";
          }
      };  }
```

output:
1
2
3
4
5
6
7
8

```cpp
#include <iostream>
using namespace std;
int main(){
 string name[2][2]={
    {"amarth","patel"},
    {"lucky","patel"}
    };
for (int i = 0; i < 2; i++)
{
    for (int j= 0; j< 2; j++)
    {
        cout<<name[i][j] <<" ";
    }

}; }
output:amarth patel lucky patel
```

output:
amarth patel lucky patel

```cpp
#include<iostream>

using namespace std;
main( )
{   int arr[4][2] = {
        { 10, 11 },
        { 20, 21 },
        { 30, 31 },
        { 40, 41 }
        } ;
    int i,j;
    cout<<"Printing a 2D Array:\n";
    for(i=0;i<4;i++)
    {
        for(j=0;j<2;j++)

        {

            cout<<"\t"<<arr[i][j];
        }
        cout<<endl;
    } }
```

output:
Printing a 2D Array:
        10   11
        20   21
        30   31
        40   41

O8.2d matrix

```cpp
#include<iostream>
using namespace std;
main( )
{
    int  s[2][2];
    int  i, j;
    cout<<"\n2D Array Input:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\ns["<<i<<"]["<<j<<"]=  ";
          cin>>s[i][j];
      }
    }

    cout<<"\nThe 2-D Array is:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\t"<<s[i][j];
      }
      cout<<endl;
    }
}
```

output:
2D Array Input:

s[0][0]= 1
s[0][1]= 2
s[1][0]= 3
s[1][1]= 4

The 2-D Array is:
        1   2
        3   4

09.3d loop array

```cpp
#include <iostream>
using namespace std;
int main (){
    int number [2][2][4]={
        {{1,2,3,4},{5,6,7,8}},
        {{9,10,11,12},{13,14,15,16}},
    };

    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)
        {
            for (int z = 0; z < 4; z++)
            {
                cout<<number[i][j][z] <<" ";
            }
        }
    }
}
output: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
```

10.input array value in 3d array

```cpp
#include <iostream>
using namespace std;
int main (){
    int number [2][2][4];

    for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)
        {
            for (int z = 0; z < 4; z++)
            {
                cout<<"enter array value : ";
                cin>>number[i][j][z];
            }
        } }


        for (int i = 0; i < 2; i++)
    {
        for (int j = 0; j < 2; j++)
        {
            for (int z = 0; z < 4; z++)
            {
                cout<<number[i][j][z] <<" ";
            } }
    } ; }
```

output:
enter array value : 1
enter array value : 2
enter array value : 3
enter array value : 4
enter array value : 5
enter array value : 6
enter array value : 7
enter array value : 8
enter array value : 9
enter array value : 10
enter array value : 11
enter array value : 12
enter array value : 13
enter array value : 14
enter array value : 15
enter array value : 16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

11.adding two array through loop

```cpp
#include <iostream>
using namespace std;
int main (){
int a[5] ,b[5] ,c[5];

cout<<"enter array a value : \n";
for (int i = 0; i < 5; i++)
{
    cin>>a[i];
}

cout<<"enter array b value : \n";
for (int i = 0; i < 5; i++)
{
    cin>>b[i];
}


for (int i = 0; i < 5; i++)
{
    c[i]=a[i]+b[i];
}


for (int i = 0; i < 5; i++)
{
    cout<<"adding a + b : "<<c[i] <<endl;
}

}
```

```
output:
enter array a value :
1
2
3
4
5
enter array b value :
1
2
3
4
5
adding a + b : 2
adding a + b : 4
adding a + b : 6
adding a + b : 8
adding a + b : 10
```

```cpp
#include <iostream>
using namespace std;
int main (){
int a[5] ,b[5] ,c[5];

cout<<"enter array a value : \n";
for (int i = 0; i < 5; i++)
{
    cin>>a[i];
}

cout<<"enter array b value : \n";
for (int i = 0; i < 5; i++)
{
    cin>>b[i];
}


for (int i = 0; i < 5; i++)
{
    c[i]=a[i]+b[i];
    cout<<"adding a +b :" <<c[i] <<"\n";
}

}
```

output:
enter array a value :
1
2
3
4
5
enter array b value :
1
2
3
4
5
adding a +b :2
adding a +b :4
adding a +b :6
adding a +b :8
adding a +b :10

making single matrix

```cpp
#include<iostream>
using namespace std;
main( )
{
    int  s[2][2];
    int  i, j;
    cout<<"\n2D Array Input:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\ns["<<i<<"]["<<j<<"]=  ";
          cin>>s[i][j];
      }
    }

    cout<<"\nThe 2-D Array is:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\t"<<s[i][j];
      }
      cout<<endl;
    }
}
```

output:
2D Array Input:

s[0][0]= 1

s[0][1]= 2

s[1][0]= 3

s[1][1]= 4

The 2-D Array is:
      1   2
      3   4

12.making two matrix

```cpp
#include<iostream>
using namespace std;
main( )
{
    int   s[2][2] , z[2][2];
    int   i, j;
    cout<<"\n first 2D Array Input:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\ns["<<i<<"]["<<j<<"]=  ";
          cin>>s[i][j];
      }
    }

    cout<<"\nThe 2-D Array is:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\t"<<s[i][j];
      }
      cout<<endl;
    }

    cout<<"\n second 2D Array Input:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\nz["<<i<<"]["<<j<<"]=  ";
          cin>>z[i][j];
      }
    }

    cout<<"\nThe 2-D Array is:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
          cout<<"\t"<<z[i][j];
      }
      cout<<endl;
    }

}
```

output:
 first 2D Array Input:

s[0][0]= 1

s[0][1]= 2

s[1][0]= 3

s[1][1]= 4

The 2-D Array is:
        1   2
        3   4

 second 2D Array Input:

z[0][0]= 1

z[0][1]= 2

z[1][0]= 3

z[1][1]= 4

The 2-D Array is:
                1   2
                3   4

13.adding two matrix

```cpp
#include<iostream>
using namespace std;
main()
{
    int  m1[5][5], m2[5][5], m3[5][5];
    int  i, j, r, c;

    cout<<"Enter the no.of rows of the matrices to be added(max 5):";
    cin>>r;
    cout<<"Enter the no.of columns of the matrices to be added(max 5):";
    cin>>c;

    cout<<"\n1st Matrix Input:\n";
    for(i=0;i<r;i++)
    {
      for(j=0;j<c;j++)
      {
          cout<<"\nmatrix1["<<i<<"]["<<j<<"]=  ";
          cin>>m1[i][j];
      }
    }

    cout<<"\n2nd Matrix Input:\n";
    for(i=0;i<r;i++)
    {
      for(j=0;j<c;j++)
      {
          cout<<"\nmatrix2["<<i<<"]["<<j<<"]=  ";
          cin>>m2[i][j];
      }
    }

    cout<<"\nAdding Matrices...\n";

    for(i=0;i<r;i++)
    {
      for(j=0;j<c;j++)
      {
          m3[i][j]=m1[i][j]+m2[i][j];
      }
    }
```

```cpp
        cout<<"\nThe resultant Matrix is:\n";

        for(i=0;i<r;i++)
        {
          for(j=0;j<c;j++)
          {
              cout<<"\t"<<m3[i][j];
          }
          cout<<endl;
        }

}
```

output:
Enter the no.of rows of the matrices to be added(max 5):2
Enter the no.of columns of the matrices to be added(max 5):2

1st Matrix Input:

matrix1[0][0]= 1

matrix1[0][1]= 2

matrix1[1][0]= 3

matrix1[1][1]= 4

2nd Matrix Input:

matrix2[0][0]= 1

matrix2[0][1]= 2

matrix2[1][0]= 3

matrix2[1][1]= 4

Adding Matrices...

The resultant Matrix is:
**   2   4**
**   6   8**

14.reverse a number array

```cpp
#include <iostream>
using namespace std;
int main (){

    int a[5];
    cout<<"enter number(max 4)" <<endl;
    for (int i = 1; i <= 4; i++)
    {
        cin>>a[i];
    }
    for (int i = 4; i > 0; i--)
    {
        cout<<"\t"<<a[i];
    }}

```

15.print all negative elements in an array

```cpp
#include <iostream>
#define MAX_SIZE 100
using namespace std;
int main (){

    int arry[MAX_SIZE];
    int  number ;
   cout<<"enter size of array ";
   cin>>number;

   for (int i = 0; i < number; i++)
   {
     cin>>arry[i];
   }

      for (int i = 0; i < number; i++)
   {
      if (arry[i]<0)
      {
        cout<<" all negative element  : "<<arry[i];
      }

   }
}

output:
enter size of array 5
1
2
-4
4
5
 all negative element  : -4
```

16.to count total number of negative elements in array

```cpp
// program to print all negative elements in an array

#include <iostream>
#define MAX_SIZE 100
using namespace std;
int main (){

    int arry[MAX_SIZE];
    int  number   , count=0;
    cout<<"enter size of array ";
    cin>>number;

    for (int i = 0; i < number; i++)
    {
      cin>>arry[i];
    }

        for (int i = 0; i < number; i++)
    {
        if (arry[i]<0)
        {
          count++;
        }


    }

    cout<<"number of negative element : "<<count;
}

output:
enter size of array 5
1
2
-7
-8
-9
number of negative element : 3
```

17.to find sum of all elements of an array

```cpp
#include <iostream>
#define MAX_SIZE 100
using namespace std;
int main (){

    int arry[MAX_SIZE];
    int  number   , sum=0;
   cout<<"enter size of array ";
   cin>>number;
   cout<<"you enter " <<number <<"array size "<<endl;

   for (int i = 0; i < number; i++)
   {
     cin>>arry[i];
   }

     for (int i = 0; i < number; i++)
   {

       sum=sum+arry[i];

   }

   cout<<"sum of all number in array : "<<sum;
}
output:
enter size of array 5
you enter 5array size
1
2
3
4
5
sum of all number in array : 15
```

18.to count even & odd elements

```cpp
#include <iostream>
#define MAX_SIZE 100
using namespace std;
int main (){

    int arry[MAX_SIZE];
    int  number  , even=0 ,odd=0;
   cout<<"enter size of array ";
   cin>>number;
   cout<<"you enter " <<number <<"array size "<<endl;

   for (int i = 0; i < number; i++)
   {
     cin>>arry[i];
   }

      for (int i = 0; i < number; i++)
   {

     if (arry[i]%2==0)
     {

       even++;
     }
     else{
            odd++;

     }
     }
   cout<<"even :" <<even <<endl;
    cout<<"odd : "<<odd;
}
```

output:
enter size of array 5
you enter 5**array size**
1
2
3
4
5
even :2
odd : 3

19.find maximum and minimum element in array

```cpp
#include <iostream>
#define MAX_SIZE 100
using namespace std;
int main (){
    int arry[MAX_SIZE];
    int  number ,min ,max   ;
   cout<<"enter size of array ";
   cin>>number;
   cout<<"you enter " <<number <<"array size "<<endl;

   for (int i = 0; i < number; i++)
   {
     cin>>arry[i];
   }
max=arry[0] ;
min=arry[0];
    for (int i = 0; i < number; i++)
   {

     if (arry[i] >max)
     {
     max=arry[i];
     }

     if (arry[i]<min)
     {
        min=arry[i];
     }

     }
     cout<<"maximun :" <<max <<endl;
      cout<<"minimun : "<<min;
}
output:
enter size of array 5
you enter 5array size
1
2
3
4
5
maximun :5
minimun : 1
```

20. to insert an element in array

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

int main(){

  int array[100],size ,number,postion;

  cout<<"enter the size of array " <<endl;
  cin>>size;
  for (int i = 0; i < size; i++)
  {
    cin>>array[i];
  }

  cout<<"array before  insert new element " <<endl;

 for (int i = 0; i < size; i++)
  {
    cout<<"\t"<<array[i];
  }

cout<<endl;
cout<<"enter the number you want to update in array "<<endl;
cin>>number;
cout<<"enter the postion you want this number  update in array "<<endl;
cin>>postion;

if (postion >=size + 1 || postion<=0 ) //if position is greater than or equal to
size + 1 or position is less than or equal to 0
{
    cout<<"invalid";
}

else{
    for (int i = 5; i >= postion; i--)
    {
        array[i]=array[i-1];
    }
    array[postion-1]=number;
    size++;

}
 cout<<"array after  insert new element "<<endl;
```

```cpp
 for (int i = 0; i < size; i++)
  {
    cout<<"\t"<<array[i];
  }}
```
output:
enter the size of array
5
1
2
3
5
4
array before insert new element
       1   2   3   5   4
enter the number you want to update in array
45
enter the postion you want this number update in array
2
array after insert new element
       1   45   2   3   5   4

21. To Sort An Array In Ascending Order

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

int main(){

    int a[100] ,size ,temp;

    cout<<"enter size of array " <<endl;
    cin>>size;
 cout<<"enter value of array " <<endl;
    for (int i = 0; i < size; i++)
    {
        cin>>a[i];
    }

    cout<<"before chnge into ascending order"<<endl;
        for (int i = 0; i < size; i++)
    {
        cout<<"\t"<<a[i];
    }

cout<<endl;
    for (int i = 0; i < size; i++)
    {
        for (int j = i+ 1; j < size; j++)
        {
            if (a[i]>a[j])
            {
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
            }

        }

    }

    cout<<"after chnge into ascending order"<<endl;
    for (int i = 0; i < size; i++)
    {
        cout<<"\t"<<a[i];
    }
}
```

```
output:
enter size of array
5
enter value of array
88
99
44
55
1
before chnge into ascending order
        88      99      44      55      1
after chnge into ascending order
        1       44      55      88      99


size =5 ,enter value = 21345=(2(0),1(1),3(2),4(3),5(4))


        for (int i = 0; i <5; i++)
    {
        for (int j = 0+1; j < 5; j++)
        {
            if (a[0]>a[1])         //   condition true
            {
                temp=a[i];         // temp= a[0]
                a[i]=a[j];         // a[0]=a[1]
                a[j]=temp;         // a[1]=temp
            }}}

in temp store a[i]=a[0]=a(2), now a[i] is empty means temp store = 2 ;
a[i] store a[j] means a[j] empty now , so the value of a[i]is 1;
now value of temp =2 , is store in a[j] = a[1]
again loop
    for (int i = 0; i <5; i++)
    {
        for (int j = 1+1; j < 5; j++)
        {
            if (a[1]>a[2])         //(21345)  condition false
            {
                temp=a[i];
                a[i]=a[j];
                a[j]=temp;
            }}}
```

22.To Sort An Array In decending Order

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

int main(){

    int a[100] ,size ,temp;

    cout<<"enter size of array " <<endl;
    cin>>size;
 cout<<"enter value of array " <<endl;
    for (int i = 0; i < size; i++)
    {
        cin>>a[i];
    }

    cout<<"before chnge into decending order"<<endl;
        for (int i = 0; i < size; i++)
    {
        cout<<"\t"<<a[i];
    }

cout<<endl;
for (int i = 0; i < size; i++)
 { for (int j = i+ 1; j < size; j++)
    {    if (a[i]<a[j])
        {  temp=a[i];
           a[i]=a[j];
            a[j]=temp;
         }

        }

    }
cout<<"after chnge into decending
order"<<endl;
    for (int i = 0; i < size; i++)
    {
        cout<<"\t"<<a[i];
    }
}
```

```
output:
enter value of array
1
2
77
55
12
before chnge into decending order
        1       2       77      55      12
after chnge into decending order
        77      55      12      2       1
```

103   AMARTH PATEL

POINTER

01. nrml reference program

```cpp
#include <iostream>
using namespace std;
int main (){
        string food="mango";
    string &khana=food;
cout<<food <<"\n";      //output:mango
cout<<khana <<"\n";     //output:mango
cout<<&food <<"\n";     //output:0x61fef0          ram memory address
cout<<&khana;           //output:0x61fef0          ram memory address
}
```

```cpp
#include <iostream>
using namespace std;
int main (){
    int food=500;
    int &khana=food;
cout<<food <<"\n";      //output:500
cout<<khana <<"\n";     //output:500
cout<<&food <<"\n";     //output:0x61ff08           ram memory address
cout<<&khana;           //output:0x61ff08           ram memory address
}
```

```cpp
#include <iostream>
using namespace std;
int main (){
    string food="mango";
    string* ptr= &food;

    cout<<*ptr <<endl;          //output:mango
    cout<<food <<endl;          //output:mango

    cout<<&food <<endl;         //output:0x61fef0
    cout<<ptr <<endl;            //output:0x61fef0

}
```

02.modify the pointer value

```cpp
#include <iostream>
using namespace std;
int main (){
    string food="mango";
    string* ptr= &food;

    cout<<*ptr <<endl;          //output:mango
    cout<<food <<endl;          //output:mango

    cout<<&food <<endl;         //output:0x61fef0
    cout<<ptr <<endl;            //output:0x61fef0


   *ptr="apple";

    cout<<*ptr <<endl;          //output:apple
    cout<<food <<endl;          //output:apple

    cout<<&food <<endl;         //output:0x61fef0
    cout<<ptr <<endl;            //output:0x61fef0

}


#include <iostream>
using namespace std;
int main(){
    int i=10;
    int *ptr;
    ptr=&i;
    cout<<i<<endl;              //output:10
    cout<<*ptr;                //output:10
    return 0;
}
```

```cpp
#include <iostream>
using namespace std;
    int main(){
    int i=10;
    int k=20;
    int *ptr;
     ptr=&i;
    cout<<i<<endl;                      //output:10
    cout<<*ptr<<endl;                   //output:10
    cout<<ptr<<endl;                    //output:0x61ff08
  cout<<"address of i "<<&i;           //address of i 0x61ff08
  cout<<endl;cout<<endl;
  ptr=&k;
    cout<<i<<endl;                      //output:10
    cout<<*ptr<<endl;                   //output:20
    cout<<ptr<<endl;                    //output:0x61ff04
  cout<<"address of i "<<&k;           //address of i 0x61ff04
    return 0;}
```

03.How to print value of a Variable using its memory address?

```cpp
#include <iostream>
using namespace std;
int main() {
    int a;
    a=444;
    cout<<&a<<"\n";
    cout<<*reinterpret_cast<int*>(0x61ff0c);        //output:444
    return 1;
}
```

04.Array and loop in pointer

```cpp
#include <iostream>
using namespace std;
int main(){
int i[5],x ,*ptr;
ptr=i;
for( x=0;x<5;x++)
{ cout<< "Enter value  for  cell " <<x <<" : ";
   cin>>i[x];
}
cout<<*ptr <<endl;
cout<<ptr <<endl;
for ( x = 0; x < 5; x++)
{ cout<<"\n value for cell\t" <<x <<":";
   cout<<i[x];
 }
return 0;}
```

```
   output:
Enter value  for  cell 0 : 10
Enter value  for  cell 1 : 20
Enter value  for  cell 2 : 30
Enter value  for  cell 3 : 40
Enter value  for  cell 4 : 50
10
0x61fef4

 value for cell 0:10
 value for cell 1:20
 value for cell 2:30
 value for cell 3:40
 value for cell 4:50
```

```cpp
#include <iostream>
using namespace std;
int main(){
int i[5],x ,*ptr;
ptr=i;
for( x=0;x<5;x++)
{ cout<< "Enter value  for  cell " <<x <<" : ";
 cin>>i[x];
}
for ( x = 0; x < 5; x++)
{
cout<<"\n value for cell\t" <<x <<":";
cout<<*ptr;
cout<<"\n address of cell " <<x <<" : " <<ptr;
ptr++;}
    return 0; }
```

```
   output:
Enter value  for  cell 0 : 10
Enter value  for  cell 1 : 20
Enter value  for  cell 2 : 30
Enter value  for  cell 3 : 40
Enter value  for  cell 4 : 50

 value for cell 0:10
 address of cell 0 : 0x61fef4
 value for cell 1:20
 address of cell 1 : 0x61fef8
 value for cell 2:30
 address of cell 2 : 0x61fefc
 value for cell 3:40
 address of cell 3 : 0x61ff00
 value for cell 4:50
 address of cell 4 : 0x61ff04
```

05.to swap two numbers using pointers

```cpp
#include <iostream>
using namespace std;
int main (){

    int number1 , number2 ,temp;
    int* n1=&number1;
    int* n2=&number2;

    cout<<"enter one number"<<endl;
    cin>>number1;
    cout<<"enter second number"<<endl;
    cin>>number2;

    temp=*n1;
    *n1=*n2;
    *n2=temp;

    cout<<*n1 <<"\n";        //output:2
    cout<<*n2;               //output:1

}

#include <iostream>
using namespace std;
void swap(int* n1,int* n2 ){
    int temp;
    temp=*n1;
    *n1=*n2;
    *n2=temp;
    cout<<"value of number1 is :"<<*n1 <<endl;
    cout<<"value of number2 is :"<<*n2 <<endl;

}
int main (){
    int number1=5 , number2=95;
    swap(&number1,&number2);
}
output:
value of number1 is :95
value of number2 is :5
```

06. add two numbers using pointers

```cpp
#include <iostream>
using namespace std;
void add(int* n1,int* n2 ){
    int sum;
    sum=*n1 + *n2;
    cout<<"sum of number1 and  number2 is :"<<sum;
}
int main (){
    int number1=5 , number2=95;
    add(&number1,&number2);
}
output:sum of number1 and  number2 is :100
```

```cpp
#include <iostream>
using namespace std;
int main (){
     int number1=50,number2=50,*ptr1,*ptr2;
    ptr1=&number1;
    ptr2=&number2;
    cout<<*ptr1+*ptr2;         //output:100
}
```

07. Find Sum of Array Elements

```cpp
#include <iostream>
using namespace std;
int main (){
    int a[5],sum=0 ,*ptr;
    for (int i = 0; i < 5; i++)
    {
       cin>>a[i];
    }
     ptr=a;
    for (int i = 0; i < 5; i++)
    {
       sum=sum + *(ptr+i);

    }

cout<<"total : "<<sum;
}
```

```
output:
10
10
10
10
10
total : 50
```

08.to find length of string using pointer

```cpp
#include <iostream>
using namespace std;
int main (){
    string a="amarth";
    int len=0;
    for (int i = 0; a[i] !='\0' ; i++)
    {
        len++;
    }
    cout<<len;            //output:6
}
```

```cpp
#include <iostream>
using namespace std;
int main (){
    string a="amarth";
    int len=0 ,i=0;
    while (a[i]!='\0')
    {
        len++;
        i++;
    }
    cout<<len } ;            //output:6
```

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

int main() {
    char str[100];
    char *p = str;
    int len = 0;

    cout << "Enter a string: ";
    cin >> str;

    while (*p != '\0') {
        len++;
        p++; }

    cout << "Length of the string is " << len << endl;
}
```

```
output:
Enter a string: amarth
Length of the string is 6
```

09.to copy one string to another string

```cpp
#include <iostream>
using namespace std;
int main (){
    char a [100], b[100] ;
    char *p1=a;
    char *p2=b;
    cin>>a;                             //input:amarth

    while (*(p2++)=*(p1++));
    cout<<b;                            //output: amarth

}
```

10.Print Elements Of Array In Revers Order Using Pointer for loop

```cpp
#include <iostream>
using namespace std;
 int main() {

   int arr[5]={1,2,3,4,5};
     int *p;
     p=&arr[4];
     for(int i=0;i<5;i++){
        cout<<*p;
        p--;} }            //outpput:54321


using namespace std;
 int main() {

   int arr[5]={1,2,3,4,5};
     int *p;
     p=&arr[4];
     while( p>=arr){
        cout<<*p;                      //54321
        p--;
        }

    return 0;

}
```

Contents