

1. Basics of Programming – I

Q) Add n number from user

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;
    int i = 1;
    int num;
    int sum = 0;
start:
    if (i <= n)
    {
        cout << "enter num :" << endl;
        cin >> num;
        sum = sum + num;
        i = i + 1;
        goto start;
    }
    else
    {
        cout << "final ans num " << sum;
    }
    return 0;
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :
4
enter num :
1
enter num :
2
enter num :
5
enter num :
8
final ans num 16
```

Let's solve some Patterns

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    if (cin >> n) {
        cout << "abc"<<endl;
    }

    if (cout<<"xyz") {
        cout<<endl;
        cout << "lmn";
    }
    return 0;
}
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
-1
abc
xyz
lmn
```

```
#include <iostream>

using namespace std;

int main()
{
    int n=0;
    for(; ;){
        if(n<5){
            cout<<n<<endl;
            n=n+1;
        }
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
0
1
2
3
4
```

```
#include <iostream>

using namespace std;

int main()
{
    int a=(5,3,2,1);
    cout<<a;
    return 0;
}
```

Output :

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
1
```

```
#include <iostream>

using namespace std;

int main()
{
    int a=10,b,c;
    b=a++;
    c=a;
    cout<<a<<" "<<b<<" "<<c;
    return 0;
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
11 10 11
```

Comma operator

```
#include <iostream>

using namespace std;

int main()
{
    int i, j;
    j = 10;
    i = (j+100, j + 100, 999 + j);
    cout << i;
    int a = (2, 5, 8);
    cout << endl << a;
    return 0;
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
1009
8
```

```
#include <iostream>

using namespace std;

int main()
{
    int i, j;
    j = 10;
    i = (j++, j + 100, 999 + j);
    cout << i;
    int a = (2, 5, 8);
    cout << endl << a;
    return 0;
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
1010
8
```

Prime number

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number"<<endl;
    cin>>n;
    bool isPrime=true;
    for(int i=2;i<n;i++){
        if(n%i==0){
            isPrime=false;
            break;
        }
    }
    if(isPrime){
        cout<<"prime number";
    }
    else{
        cout<<"NOT prime number";
    }
    return 0;
}
```

Output

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number
15
NOT prime number
```

Q) compiler vs interpreter

<https://www.geeksforgeeks.org/difference-between-compiler-and-interpreter/>

Q) short maximum and minimum

```
#include <iostream>
#include<limits.h>

using namespace std;

int main()
{
    short a=32767;
    short b=10;

    short c=a+b;
    cout<<"value of short c :"<<c<<endl;
    return 0;
}
```

Note :-32767 mai 10 add karenge toh 10 mai se 1 kam ho jayega ,10 ki value 9 ho jayegi aur 32767 ma se -9 = 32759

$32767 + 10 = (-1) + (-32768) + (10) = -32759$

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
value of short c :-32759
```

Q) wrap around property

```
#include <iostream>
#include<limits.h>

using namespace std;

int main()
{
    int a = 2147483647;
    int b = 10;
    int c = a + b;

    cout << "value of short c :" << c;
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
value of short c :-2147483639
```

Note :- $2147483647 + 10 = (-1) - 2147483648 + 10$

$= -2147483639$

```
#include <iostream>
#include <limits.h>

using namespace std;

int main()
{
    int n;
    cout << "enter value" << endl;
    cin >> n;
    for (int row = 0; row < n; row++)
    {
        for (int col = 0; col < n - row; col++)
        {
            if (row == 0 || col == 0 || col == n - (row + 1))
            {
                cout << "*";
            }
            else
            {
                cout << " ";
            }
        }
        cout << endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter value
5
*****
*  *
*  *
**
*
```

11/04/2023

```
#include <iostream>
#include <limits.h>

using namespace std;

int main()
{
    int n;
    cout << "enter value" << endl;
    cin >> n;

    for(int row=0;row<n;row++){
        for(int col=0;col<n-(row+1);col++){
            cout<<" ";
        }
        for(int k=0;k<(2*row)+1;k++){
            cout<<"*";
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter value
4
    *
   ***
  *****
 *****
```



```
#include <iostream>
#include <limits.h>

using namespace std;

int main()
{
    int n;
    cout << "enter value" << endl;
    cin >> n;

    for(int row=0;row<n;row++){
        for(int col=0;col<n-(row+1);col++){
            cout<<" ";
        }
        for(int k=0;k<row+1;k++){
            cout<<"* ";
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter value
5
    *
   * *
  * * *
 * * * *
* * * * *
```

```
#include <iostream>

using namespace std;

int main(){
    int n;
    cout<<"enter number :"<<endl;
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            cout<<"* ";
        }
        cout<<endl;
        for(int k=0;k<row+1;k++){
            cout<<" ";
        }
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :
4
* * * *
 * * *
  * *
   *
```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;
    for(int row=0;row<n;row++){
        for(int space=0;space<row;space++){
            cout<<" ";
        }
        for(int col=0;col<n-row;col++){
            cout<<"* ";
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :
4
* * * *
* * *
* *
*
```

```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;
    for (int row = 0; row < n; row++)
    {
        for (int col = 0; col < n - (row + 1); col++)
        {
            cout << " ";
        }
        for (int k = 0; k < row + 1; k++)
        {
            cout << "* ";
        }
        cout << endl;
    }
    for (int row1 = 0; row1 < n; row1++)
    {
        for (int col1 = 0; col1 < n - row1; col1++)
        {
            cout << "* ";
        }
        cout << endl;
        for (int space1 = 0; space1 < row1 + 1; space1++)
        {
            cout << " ";
        }
    }
}

```

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :
4
    *
   **
  ***
 ****
*****
 ****
  ***
   **
    *

```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;
    for (int row = 0; row < n; row++)
    {
        for (int col = 0; col < n - (row + 1); col++)
        {
            cout << " ";
        }

        for (int i = 0; i < 2 * row + 1; i++)
        {
            if (i == 0 || i == (2 * row + 1) - 1)
            {
                cout << "*";
            }
            else
            {
                cout << " ";
            }
        }
        cout << endl;
    }
}
```

```

for (int row = 0; row < n; row++)
{
    for (int col = 0; col < row; col++)
    {
        cout << " ";
    }

    for (int j = 0; j < 2 * (n - row) - 1; j++)
    {
        if (j == 0 || j == 2 * (n - row) - 2)
        {
            cout << "*";
        }
        else
        {
            cout << " ";
        }
    }
    cout << endl;
}
}

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp

PS C:\Users\home\Desktop\C++Code> .\a.exe

enter number :

4

```

  *
 * *
*   *
*   *
*   *
*   *
*   *
*   *
  *
  *

```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n-(row+1);col++){
            cout<< " ";
        }

        for(int i=0;i<2*row+1;i++){
            if(i==0 || i==(2*row+1)-1 || row==n-1){
                cout<<"*";
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }

    for(int row=0;row<n-1;row++){
        for(int col=0;col<row+1;col++){
            cout<<" ";
        }

        for(int k=0;k<(n+1)-(2*row);k++){
            if(k==0 || k==(n+1)-(2*row)-1){
                cout<<"*";
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }
}
```

```
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
```

```
enter number :
```

```
4
```

```
 *
```

```
 * *
```

```
 *   *
```

```
*****
```

```
 *   *
```

```
 * *
```

```
 *
```



```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter n value : "<<endl;
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            cout<<"*";
        }
        for(int k=0;k<2*row+1;k++){
            cout<<" ";
        }
        for(int j=0;j<n-row;j++){
            cout<<"*";
        }
        cout<<endl;
    }
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<"*";
        }
        for(int k=0;k<2*(n-row)-1;k++){
            cout<<" ";
        }
        for(int j=0;j<row+1;j++){
            cout<<"*";
        }
        cout<<endl;
    }
}

```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter n value :
5
*****
****
***
**
*
*
**
***
****
*****
```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter n value : "<<endl;
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*row+1;col++){
            if(col % 2==1){
                cout<<"*";
            }
            else{
                cout<<row+1;
            }
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter n value :
4
1
2*2
3*3*3
4*4*4*4
```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter n value : "<<endl;
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*row+1;col++){
            if(col % 2==1){
                cout<<"*";
            }
            else{
                cout<<row+1;
            }
        }
        cout<<endl;
    }
    for(int row=0;row<n;row++){
        for(int col=0;col<2*(n-row)-1;col++){
            if(col % 2==1){
                cout<<"*";
            }
            else{
                cout<<n-row;
            }
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
```

```
PS C:\Users\home\Desktop\C++Code> .\a.exe
```

```
enter n value :
```

```
4
```

```
1
```

```
2*2
```

```
3*3*3
```

```
4*4*4*4
```

```
4*4*4*4
```

```
3*3*3
```

```
2*2
```

```
1
```

```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter n value : "<<endl;
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<row+1;
            if(col!=row){
                cout<<"*";
            }
        }
        cout<<endl;
    }
    //2nd part
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            cout<<n-row;
            if(col!=n-row-1){
                cout<<"*";
            }
        }
        cout<<endl;
    }
}

```

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter n value :
4
1
2*2
3*3*3
4*4*4*4
4*4*4*4
3*3*3
2*2
1

```

14/04/2023

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<col+1;
        }
        int sum=row;
        for(int k=0;k<row;k++){
            cout<<sum;
            sum=sum-1;
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
1
121
12321
1234321
123454321
```

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    char ch=65;

    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<char(ch+col);
        }
        int sum=row;
        for(int k=0;k<row;k++){
            cout<<char(ch+sum-1);
            sum=sum-1;
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
A
ABA
ABCBA
ABCD CBA
ABCDEDCBA
```

2nd Approach

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<char('A'+col);
        }
        int sum=row;
        for(int k=0;k<row;k++){
            cout<<char('A'+sum-1);
            sum=sum-1;
        }
        cout<<endl;
    }
}
```

```
PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
A
ABA
ABCBA
ABCDCA
ABCDEDCBA
```



```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n;col++){
            if(row==0 || row==n-1 || col==0 || col==n-1){
                cout<<"*";
            }
            else{
                cout<<" ";
            }
            cout<<" ";
        }
        cout<<endl;
    }
}

```

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
* * * * *
*       *
*       *
*       *
* * * * *

```

```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            if(row==0 || col==0 || col==n-row-1){
                cout<<"*";
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }
}

```

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
*****
*  *
*  *
**
*

```

```

#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter number :";
    cin>>n;
    for(int row=0; row<n-1; row++){
        for(int col=0; col<n-row-1; col++ ){
            cout<<" ";
        }
        for(int col=0; col<2*row+1; col++){
            if(col==0||col==2*row){
                cout<<"*";
            }
            else{
                cout<<" ";
            }
        }

        cout<<endl;
    }
    for(int row=0;row<1;row++){
        for(int col=0;col<n;col++){
            cout<<"*";
            cout<<" ";
        }
    }
}

```

```

PS C:\Users\home\Desktop\C++Code> g++ .\f77.cpp
PS C:\Users\home\Desktop\C++Code> .\a.exe
enter number :5
    *
  * *
 *   *
*     *
* * * * *

```

15/04/2023

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

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n-1;row++){
        for(int col=0;col<2*row+1;col++){
            if(col==0){
                cout<<col+1;
            }
            else if(col==2*row){
                cout<<row+1;
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }
    for(int row=0;row<1;row++){
        for(int col=0;col<n;col++){
            cout<<col+1;
            cout<<" ";
        }
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
1
1 2
1 3
1 4
1 2 3 4 5
```

2nd Approach

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

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;

    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            if(row==0 || row==n-1 ){
                cout<<col+1<<" ";
            }
            else if(col==0 || col==row){
                cout<<col+1<<" ";
            }

            else{
                cout<<"  ";
            }
        }
        cout<<endl;
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
enter n value :5
```

```
1
```

```
1 2
```

```
1 3
```

```
1 4
```

```
1 2 3 4 5
```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;

    for(int row=0;row<1;row++){
        for(int col=0;col<n;col++){
            cout<<col+1;
            cout<<" ";
        }
    }
    cout<<endl;
    for(int row=0;row<n-1;row++){
        for(int col=0;col<n-2*row+2;col++){
            if(col==0){
                cout<<row+2;
            }
            else if(col==n-2*row+1){
                cout<<5;
            }
            else{
                cout<<" ";
            }
        }
        cout<<endl;
    }

    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
1 2 3 4 5
2     5
3    5
4 5
5

```

2nd Approach

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

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;

    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            if(row==0 || row==n-1 ){
                cout<<col+1+row<<" ";
            }
            else if(col==0 || col==n-row-1){
                cout<<col+1+row<<" ";
            }

            else{
                cout<<"  ";
            }
        }
        cout<<endl;
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
1 2 3 4 5
2   5
3   5
4 5
5
```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;

    for(int row=0;row<n;row++){
        for(int col=0;col<n-(row+1);col++){
            cout<<" ";
        }
        for(int k=0;k<row+1;k++){
            cout<<k+1<<" ";
        }
        int sum=row;
        for(int j=0;j<row;j++){
            cout<<sum<<" ";
            sum=sum-1;
        }
        cout<<endl;
    }

    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
    1
  1 2 1
1 2 3 2 1
1 2 3 4 3 2 1
1 2 3 4 5 4 3 2 1

```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*n-(row+2);col++){
            cout<<"*";
        }
        for(int k=0;k<row+1;k++){
            cout<<row+1;
            if(k!=row){
                cout<<"*";
            }
        }
        for(int col=0;col<2*n-(row+2);col++){
            cout<<"*";
        }
        cout<<endl;
    }

    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
*****1*****
*****2*2*****
*****3*3*3*****
*****4*4*4*4*****
*****5*5*5*5*5*****

```

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

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<"*";
        }
        cout<<endl;
    }
    for(int row=0;row<n-1;row++){
        for(int col=0;col<n-row-1;col++){
            cout<<"*";
        }
        cout<<endl;
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
*
**
***
****
*****
****
***
**
*
```

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

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*row+1;col++){
            if(col==0 || col==2*row){
                cout<<"*";
            }
            else if(col>0 && col<=row){
                cout<<col;
            }
            else {
                cout<<2*row-col;
            }
        }
        cout<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> .\a.exe
enter n value :4
*
*1*
*121*
*12321*
```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*row+1;col++){
            if(col==0 || col==2*row){
                cout<<"*";
            }
            else if(col>0 && col<=row){
                cout<<col;
            }
            else {
                cout<<2*row-col;
            }
        }
        cout<<endl;
    }
    for(int row=0;row<n-1;row++){
        for(int col=0;col<2*n-(2*row+3);col++){
            if(col==0 || col==2*n-(2*row+4)){
                cout<<"*";
            }
            else if(col>0 && col<=n-2*row-2){
                cout<<col;
            }
            else{
                cout<<2*n-(2*row+4)-col;
            }
        }
        cout<<endl;
    }
    return 0;
}

```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
enter n value :5
```

```
*
```

```
*1*
```

```
*121*
```

```
*12321*
```

```
*1234321*
```

```
*12321*
```

```
*121*
```

```
*1*
```

```
*
```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<2*row+1;col++){
            if(col==0 || col==2*row){
                cout<<"*";
            }
            else if(col>0 && col<=row){
                cout<<col;
            }
            else {
                cout<<2*row-col;
            }
        }
        cout<<endl;
    }
    for(int row=0;row<n-1;row++){
        for(int col=0;col<2*n-(2*row+3);col++){
            if(col==0 || col==2*n-2*(row+2)){
                cout<<"*";
            }
            else if(col>0 && col<=n-2*(row+1)){
                cout<<col;
            }
            else{
                cout<<2*n-2*(row+2)-col;
            }
        }
        cout<<endl;
    }
    return 0;
}

```

enter n value :6

*

1

121

12321

1234321

123454321

1234321

12321

321

1

*

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    int sum=1;
    for(int row=0;row<n;row++){

        for(int col=0;col<row+1;col++){
            cout<<sum;
            if(col!=row){
                cout<<"*";
            }
            sum=sum+1;
        }
        cout<<endl;
    }
    return 0;
}

```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
enter n value :5
```

```
1
```

```
2*3
```

```
4*5*6
```

```
7*8*9*10
```

```
11*12*13*14*15
```



```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<"*";
        }
        for(int col=0;col<2*n-2*row-1;col++){
            cout<<" ";
        }
        for(int col=0;col<row+1;col++){
            cout<<"*";
        }
        cout<<endl;
    }
    //2nd part
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row;col++){
            cout<<"*";
        }
        for(int col=0;col<2*row+1;col++){
            cout<<" ";
        }
        for(int col=0;col<n-row;col++){
            cout<<"*";
        }
        cout<<endl;
    }
    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
*      *
**     **
***    ***
****   ****
***** *****
***** *****
****   ****
***    ***
**     **
*      *

```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        for(int col=0;col<n-row-1;col++){
            cout<<" ";
        }
        int k=0;
        for(;k<row+1;k++){
            cout<<row+k+1;
        }
        int sum=2*row;
        for(int j=0;j<row;j++){
            cout<<sum;
            sum=sum-1;
        }
        cout<<endl;
    }

    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
    1
   232
  34543
 4567654
567898765

```

```

#include<iostream>
using namespace std;

int main (){
    int n;
    cout<<"enter n value :";
    cin>>n;
    for(int row=0;row<n;row++){
        int col=0;
        for(;col<n-row-1;col++){
            cout<<" ";
        }
        for(int k=0;k<row+1;k++){
            if(row==0 || row==n-1){
                cout<<k+1<<" ";
            }
            else if(k==0){
                cout<<k+1<<" ";
            }
            else if(k==row){
                cout<<row+1;
            }
            else{
                cout<<" ";
            }
        }

        cout<<endl;
    }
    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter n value :5
    1
  1 2
1  3
1   4
1 2 3 4 5

```

17/04/2023

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

int main (){

    //right shift operator
    int a = -31;
    a = a >> 1;
    cout <<" a : "<< a<<endl;

    int b = 15;
    b = b >> 1;
    cout <<" b : "<< b<<endl;

    //left shift operator
    int c = -31;
    c = c << 1;
    cout <<" c : "<< c<<endl;

    int d = 30;
    d = d << 1;
    cout <<" d : "<< d<<endl;

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
a : -16
b : 7
c : -62
d : 60
```

Note : left shift operator multiply by 2 ,positive and negative number. $(num * 2^n)$

: right shift operator divide by 2,if number is positive and number negative hai toh add 1 hoga
uske baad divide hoga 2 se. $(num / 2^n)$

```
#include<iostream>

using namespace std;

int main (){

    int a = 4;
    cout << (++a)*(++a);
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
36
```

Note : two time increment than multiply

19/04/2023

Function & Some Problem Statements

Q)write a function to display area of circle

```
#include <iostream>

using namespace std;

double getAreaOfCircle(int r){
    double ans =3.14*r*r;
    return ans;
}

int main()
{
    int r;
    cout<<"enter the value of r :"<<endl;
    cin>>r;
    double result= getAreaOfCircle(r);
    cout<<"Area Of Circle is "<<result;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter the value of r :
5
```

Q)find number is odd or even

```
#include <iostream>

using namespace std;

bool getEvenOrOdd(int n){
    bool flag=true;
    if(n%2==0){
        return true;
    }
    return false;
}

int main()
{
    int n;
    cout<<"enter the value of n :"<<endl;
    cin>>n;
    bool result= getEvenOrOdd(n);
    if(result){
        cout<<n<<" is even number"<<endl;
    }
    else{
        cout<<n<<" is odd number"<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter the value of n :
7
7 is odd number
```

Q)print factorial

```
#include <iostream>

using namespace std;

int getfactorial(int n){
    int sum=1;
    for(int i=1;i<=n;i++){
        sum=sum*i;
    }
    return sum;
}

int main()
{
    int n;
    cout<<"enter the value of n :"<<endl;
    cin>>n;
    int result= getfactorial(n);
    cout<<"factorial of n "<<"is "<<result<<endl;

    return 0;
}
```

```
PS E:\C++Code> .\a.exe
enter the value of n :
5
factorial of n is 120
```

2nd Approach

```
#include <iostream>

using namespace std;

int getfactorial(int n){
    int sum=1;
    int m=n ;
    for(int i=1;i<=n;i++){
        sum=sum*i;
        m--;
    }
    return sum;
}

int main()
{
    int n;
    cout<<"enter the value of n :"<<endl;
    cin>>n;
    int result= getfactorial(n);
    cout<<"factorial of n "<<"is "<<result<<endl;

    return 0;
}
```

```
PS E:\C++Code> .\a.exe
enter the value of n :
4
factorial of n is 24
```

Q)check number is prime or not

```
#include <iostream>

using namespace std;

bool checkPrime(int n){

    for(int i=2;i<n;i++){
        if(n%i==0){
            return false;
            break;
        }
    }

    return true;
}

int main()
{
    int n;
    cout<<"enter the value of n :"<<endl;
    cin>>n;
    bool check =checkPrime(n);
    if(check){
        cout<<n<<" is  prime number "<<endl;
    }
    else{
        cout<<n<<" is Not  prime number "<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> .\a.exe
enter the value of n :
7
7 is  prime number
```

20/04/2023

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout << "enter number :" << endl;
    cin >> n;

    while (n != 0)
    {
        int rem = n % 10;
        cout << rem << ",";
        n = n / 10;
    }
    return 0;
}
```

PS E:\C++Code> g++ .\f77.cpp

PS E:\C++Code> .\a.exe

enter number :

623

3,2,6,

Array concept

```
#include <iostream>

using namespace std;

int main()
{
    string name[]={"abc","xyz","lmn"};
    for(int i=0;i<3;i++){
        cout<<name[i]<<" ";
    }
    cout<<endl;
    cout<<name[1]<<endl;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
abc xyz lmn
xyz
```

```
#include <iostream>

using namespace std;

int main()
{
    int digit[]={6,5,2,4};
    int ans=0;
    for(int i=0;i<4;i++){
        ans=ans*10+digit[i];
    }
    cout<<ans<<" ";
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
6524
```

Q) Find number of set bits

```
#include <iostream>

using namespace std;

int main()
{
    int n;
    cout<<"enter a value :"<<endl;
    cin>>n;
    int ans=0;
    while (n!=0)
    {
        if(n & 1){
            ans++;
        }
        n=n>>1;
    }
    cout<<"set of bits :"<<ans<<" ";
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter a value :
5
set of bits :2
```

Number System – Binary & Decimal

Q) Decimal to Binary

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

int decimalToBinary(int n) {
    int ans = 0;
    int i = 0;
    while (n != 0) {
        int digit = n & 1;
        ans = (digit * pow(10, i)) + ans;
        n = n >> 1;
        i++;
    }
    return ans;
}

int main() {
    int n;
    cout << "enter number :";
    cin >> n;
    int ans = decimalToBinary(n);
    cout << ans;
}
```

```
➤ sh -c make -s
➤ ./main
enter number :10
1010➤
```

2nd Approach



The image shows a C++ IDE with two panels. The left panel displays the source code for a program that converts a decimal number to binary. The right panel shows the console output.

```
main.cpp x +
main.cpp > f decmailToBinary
1  #include <cmath>
2  #include <iostream>
3  using namespace std;
4
5  int decmailToBinary(int n) {
6      int ans = 0;
7      int i = 0;
8      while (n != 0) {
9          int digit = n % 2;
10         ans = (digit * pow(10, i)) + ans;
11         n = n / 2;
12         i++;
13     }
14     return ans;
15 }
16 int main() {
17     int n;
18     cout << "enter number :";
19     cin >> n;
20     int ans = decmailToBinary(n);
21     cout << ans;
22 }
```

```
_ Console x +
> sh -c make -s
> ./main
enter number :5
101
```

Q) binary to decimal

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

int binaryToDecimal(int n){
    int decimal=0;
    int i=0;
    while (n)
    {
        int bit=n%10;
        decimal=decimal+bit*pow(2,i);
        n=n/10;
        i++;
    }
    return decimal;
}

int main() {
    int n;
    cout << "enter number :";
    cin >> n;
    int ans = binaryToDecimal(n);
    cout << ans;
}
```

```
PS E:\C++Code> .\a.exe
enter number :101
5
```

2nd Approach (using bitwise operator)

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

int binaryToDecimal(int n){
    int decimal=0;
    int i=0;
    while (n)
    {
        int bit=n & 1;
        decimal=decimal+bit*pow(2,i);
        n=n/10;
        i++;
    }
    return decimal;
}

int main() {
    int n;
    cout << "enter number :";
    cin >> n;
    int ans = binaryToDecimal(n);
    cout << ans;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter number :101
5
```

C++ Quiz

Q) `int a=5;`

`cout<<(!a);`

output : 0

Logical NOT	!	Returns true if the operand is false or zero	<code>int a = 3;</code> <code>!a;</code> <code>// returns</code> <code>false</code>
----------------	---	---	--

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

int fun(int =0,int=0);
int main() {
    cout<<fun(5);

    return 0;
}
int fun(int x,int y){
    return x+y;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
5
```

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

int main() {
    int a=-5;
    int k=(a++,++a);
    cout<<k;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
-3
```

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


int main() {
    if(~0==1){
        cout<<"YES";
    }
    else{
        cout<<(~0)<<endl;
        cout<<"No";
    }
    return 0;
}
```


```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
-1
No
```


One's Complement	~	Changes binary digits 1 to 0 and 0 to 1	int b = 3; (~b); //returns -4
---------------------	---	---	-------------------------------------

Correct Answers 1

✓ Following

 **TA | Geetanjali chawla** Yesterday at 19:47
@Anandkumar bitwise negation padho
-11 hi ayega

 **Bhavya (He/Him)** Yesterday at 19:52
10 ko 32 bit mei represent kaise kre batao
000000.....1010
uske baad har bit ko paltao
uske baad ye representation hai
in memory
uske baad actual number 2s complement se aayega

 **Anandkumar** OP Yesterday at 20:15
.solved thanks
✓ 1

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

int main() {

    int a=10,b=5,c=5;
    int d;
    cout<<(b+c==a)<<endl;;
    d=b+c==a;
    cout<<d;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
1
1
```

```
#include <stdio.h>

int main()
{
    int a = 10, b = 5, c = 3;

    b != !a;

    c = !!a;

    printf("%d\t%d", b, c);

}
```

A 5 1

B 0 3

C 5 3

D 1 1

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

int main()
{
    int a;
    switch (a)
    {
        cout<<"apache";
    }
    cout<<"herohonda";
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
herohonda
```

Note : CASE or Default statements is missing ,still compiler accepts .but without CASE statements nothing will be printed inside of SWITCH.

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

int main()
{
    int a;
    switch (a);
    {
        cout<<"apache"<<endl;
    }
    cout<<"herohonda";
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
apache
herohonda
```

Note : a semicolon at the end of switch(a); so that cout <<apache is out of switch.

Note : you can not use float, double, or string inside switch or switch case. We can use only int and char in switch.

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

int main()
{
    int n;cin>>n;
    int8_t sum=0;
    for(int i=1;i<=n;++i){
        sum+=i;
    }
    cout<<(int)sum<<endl;
    return 0;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
3
6
```

Note : int8_t =signed integer type with width of exactly 8, 16, 32 and 64 bits respectively

```

#include <iostream>
using namespace std;

int main()
{
    // heart star pattern
    int size;
    cin>>size;

    for (int i = size / 2; i < size; i += 2) {
        // print first spaces
        for (int j = 1; j < size - i; j += 2) {
            cout << " ";
        }
        // print first stars
        for (int j = 0; j < i; j++) {
            cout << "*";
        }
        // print second spaces
        for (int j = 0; j < size - i ; j++) {
            cout << " ";
        }
        // print second stars
        for (int j = 0; j < i ; j++) {
            cout << "*";
        }
        cout << endl;
    }
    //lower part
    //inverted pyramid
    for (int i = 0; i < size; i++) {
        for (int j = 0; j < i; j++) {
            cout << " ";
        }
        for (int j = 0; j < 2*size-2*i-1; j++) {
            cout << "*";
        }
        cout << "\n";
    }
    return 0;
}

```



```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
6
```

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

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

```
*****
```

```
*****
```

```
*****
```

```
*****
```

```
***
```

```
*
```



```

#include <iostream>
using namespace std;

int main()
{
    // heart star pattern
    int size;
    cin>>size;

    for (int row = size / 2; row < size; row += 2) {
        // print first spaces
        for (int col = 1; col < size - row; col += 2) {
            cout << " ";
        }
        // print first stars
        for (int col = 0; col < row; col++) {
            cout << "*";
        }
        // print second spaces
        for (int col = 0; col < size - row ; col++) {
            cout << " ";
        }
        // print second stars
        for (int col = 0; col < row ; col++) {
            cout << "*";
        }
        cout << endl;
    }
    //lower part
    //inverted pyramid
    for (int row = 0; row < size; row++) {
        for (int col = 0; col < row; col++) {
            cout << " ";
        }
        for (int col = 0; col < 2*size-2*row-1; col++) {
            cout << "*";
        }
        cout << "\n";
    }
    return 0;
}

```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
6
```

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

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

```
*****
```

```
*****
```

```
*****
```

```
*****
```

```
***
```

```
*
```

```

#include <iostream>
using namespace std;

int main()
{
    char operation;
    float num1, num2;
    cout << "Enter an operator (+, -, *, /): ";
    cin >> operation;
    cout << "Enter two numbers: " << endl;
    cin >> num1;
    cout << endl;
    cin >> num2;
    cout << endl;

    switch (operation) {
        case '+':
            cout << num1 << " + " << num2 << " = " << num1 + num2; break;
        case '-':
            cout << num1 << " - " << num2 << " = " << num1 - num2; break;
        case '/':
            cout << num1 << " * " << num2 << " = " << num1 * num2; break;
        case '*':
            cout << num1 << " / " << num2 << " = " << num1 / num2; break;
        default:
            // operator is doesn't match any case constant (+, -, *, /)
            cout << "Error! The operator is not correct";
            break;
    }

    return 0;
}

```

```

PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
Enter an operator (+, -, *, /): +
Enter two numbers:
5

6

5 + 6 = 11

```

Fancy pattern #2

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

int main()
{
    int n;
    cout<<"enter a number : "<<endl;
    cin>>n;
    int count=1;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<count<<" ";
            count++;
        }
        cout<<endl;
    }
    int start=count-n;
    for(int row=0;row<n;row++){
        int k=start;
        for(int col=0;col<n-row;col++){
            cout<<k<<" ";
            k++;
        }
        start=start-(n-row-1);
        cout<<endl;
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter a number :
4
1
2 3
4 5 6
7 8 9 10
7 8 9 10
4 5 6
2 3
1
```

Floyd's Triangle pattern

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

int main()
{
    int n;
    cout<<"enter a number : "<<endl;
    cin>>n;
    int count=1;
    for(int row=0;row<n;row++){
        for(int col=0;col<row+1;col++){
            cout<<count<<" ";
            count++;
        }
        cout<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
enter a number :
```

```
7
```

```
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
```

Pascal's triangle patterns

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

int main()
{
    int n;
    cout<<"enter a number :"<<endl;
    cin>>n;
    int count=1;
    for(int row=1;row<=n;row++){
        int count=1;
        for(int col=1;col<=row;col++){
            cout<<count<<" ";
            count=count*(row-col)/col;
        }
        cout<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter a number :
5
1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
```

Q check prime number or not

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

bool checkprime(int n){

    for(int i=2;i<sqrt(n);i++){
        if(n%i==0){
            return false;
        }
    }
    return true;
}

int main()
{
    int n;
    cout<<"enter a number :"<<endl;
    cin>>n;
    if(checkprime(n)){
        cout<<"prime number";
    }
    else{
        cout<<"Not prime number";
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter a number :
149
prime number
```

Print 1 to n prime number

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

bool checkprime(int n){

    for(int i=2;i<n;i++){
        if(n%i==0){
            return false;
        }
    }
    return true;
}

int main()
{
    int n;
    cout<<"enter a number :"<<endl;
    cin>>n;
    for(int i=2;i<=n;i++){
        bool isIPrime=checkprime( i);
        if(isIPrime){
            cout<<i<<" ";
        }
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter a number :
15
2 3 5 7 11 13
```

Reverse integer (leetcode Q=07)

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

int main()
{
    int n;
    cout<<"enter a number :"<<endl;
    cin>>n;

    if(n<=INT_MIN){
        return 0;
    }

    bool neg=false;
    if(n<0){
        neg=true;
        n=-n;
    }

    int ans=0;
    while(n>0){
        if(ans>INT_MAX/10){
            cout<<"answer is greater than INT_Max ";
        }
        int digit=n%10;
        ans=ans*10+digit;
        n=n/10;
    }

    if(neg){
        cout<< -ans;
    }
    else{
        cout<< ans;
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
enter a number :
```

```
-589
```

```
-985
```


```
PS E:\C++Code> .\a.exe
```

```
enter a number :
```

```
264
```

```
462
```

Q) set kth bit (gfg question)



Problem


Editorial

Submissions

Comments

Set kth bit

Basic Accuracy: 72.71% Submissions: 32K+ Points: 1

 Stand out from the crowd. Prepare with Complete Interview Preparation

Given a number **N** and a value **K**. From the right, set the Kth bit in the binary representation of N. The position of Least Significant Bit(or last bit) is 0, the second last bit is 1 and so on.

Example 1:

Input:
N = 10
K = 2


Output:
14

Explanation:
Binary representation of the given number 10 is: 1 0 1 0, number of bits in the

C++ (g++ 5.4)

Start Timer

```
1 // } Driver Code Ends
2 class Solution
3 {
4 public:
5     int setKthBit(int n, int k)
6     {
7         int mask=1<<k;
8         int ans =n | mask ;
9         return ans;
10    }
11 };
12
13
14
15
16
17
18
19
20 // } Driver Code Ends
```

 Custom Input

2469. Convert the Temperature

Hint

Easy



350



222



Companies

You are given a non-negative floating point number rounded to two decimal places `celsius`, that denotes the **temperature in Celsius**.

You should convert Celsius into **Kelvin** and **Fahrenheit** and return it as an array `ans = [kelvin, fahrenheit]`.

Return *the array* `ans`. Answers within 10^{-5} of the actual answer will be accepted.

Note that:

- `Kelvin = Celsius + 273.15`
- `Fahrenheit = Celsius * 1.80 + 32.00`

```
1 class Solution {
2 public:
3     vector<double> convertTemperature(double celsius) {
4         double k=celsius +273.15;
5         double f=celsius *1.80+32.00;
6
7         vector<double> v;
8         v.push_back(k);
9         v.push_back(f);
10        return v;
11    }
12};
```

```
#include <iostream>
#include<vector>
#include<cmath>
using namespace std;

vector<double> convertTemperature(double celsius) {
    double k=celsius +273.15;
    double f=celsius *1.80+32.00;

    vector<double> v;
    v.push_back(k);
    v.push_back(f);
    return v;
}

int main()
{
    double celsius=36.50;
    vector<double>ans;
    ans=convertTemperature(celsius);
    for (auto ans2 : ans) {
        cout<<ans2;
        cout<<",";
    }
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
309.65,97.7,
```

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

int main()
{
    int arr[5];
    cout<<"enter array value "<<endl;
    //taking input
    for(int i=0;i<5;i++){
        cin>>arr[i];
    }
    //print double value of array
    for(int i=0;i<5;i++){
        cout<<2*arr[i]<<" ";
    }
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter array value
1 2 3 4 5
2 4 6 8 10
```

```
#include <iostream>

using namespace std;

int main()
{
    int arr[10];
    int n;
    cout<<"how many number want to add "<<endl;
    cin>>n;
    cout<<"enter array value "<<endl;
    //taking input
    for(int i=0;i<n;i++){
        cin>>arr[i];
    }
    //print double value of array
    cout<<"print double values "<<endl;
    for(int i=0;i<n;i++){
        cout<<2*arr[i]<<" ";
    }
}
```

```
PS E:\C++Code> .\a.exe
how many number want to add
5
enter array value
2 3 4 5 6
print double values
4 6 8 10 12
```

```
#include <iostream>

using namespace std;

int main()
{
    int arr[]={2,5,6,8,7};
    for(int i=0;i<5;i++){
        arr[i]=1;
    }
    cout<<"value print ";
    for(int i=0;i<5;i++){
        cout<<arr[i]<<" ";
    }
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
value print 1 1 1 1 1
```

Memset function



```
main.cpp | x +
main.cpp > f main
1 #include <cmath>
2 #include <cstring>
3 #include <iostream>
4 using namespace std;
5
6
7 int main() {
8 |
9 char c2 []={'2','5','h'};
10 memset(c2, '1', sizeof(c2));
11 cout<<c2<<endl;
12
13 int arr [5];
14 memset(arr, 0, sizeof(arr));
15 cout<<"value print ";
16 for(int i=0; i<5; i++){
17     cout<<arr[i]<<" ";
18 }
19 return 0;
20 }
21

Console | x +
sh -c make -s
./main
111
value print 0 0 0 0 0
```

- **str[]**: Pointer to the object to copy the character.
- **ch**: The character to copy. It can be a character, a normal value as well a boolean value.
- **n**: Number of bytes to copy. *(0, -1) देकरा करेगा*

Return value: The memset() function returns str, the pointer to the destination string.

Time Complexity: O(N) [For traverse from begin to end of the object]

Auxiliary Space Complexity: O(1)

```
#include <iostream>

using namespace std;

int main()
{
    int arr[10];
    cout<<"value print ";
    for(int i=0;i<10;i++){
        cout<<arr[i]<<" ";
    }
    return 0;
}
```

PS E:\C++Code> g++ .\f77.cpp

PS E:\C++Code> .\a.exe

value print 6422224 6422280 6422476 1990511808 -914233446 -2 6422280 1990487853 4200960 6422352

Garbage value

Q linear search array

```
#include <iostream>

using namespace std;
bool findKey(int arr[],int size,int key){

    for(int i=0;i<size;i++){
        if(arr[i]==key){
            return true;
        }
    }
    return false;
}

int main()
{
    int arr[5]={5,8,9,6,7};
    int size=5;
    int key;
    cout<<"enter key :"<<endl;
    cin>>key;
    if(findKey(arr,size,key)){
        cout<<"Found"<<endl;
    }
    else{
        cout<<"Not Found"<<endl;
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter key :
1
Not Found
PS E:\C++Code> .\a.exe
enter key :
9
Found
```

Q) find maximum and minimum number in array

```
#include <iostream>
#include<limits.h>

using namespace std;

int main()
{
    int arr[5]={5,8,9,6,7};
    int size=5;
    //find maximum number
    int max=INT_MIN;
    for(int i=0;i<size;i++){
        if(arr[i]>max){
            max=arr[i];
        }
    }
    cout<<"maximum number is :"<<max<<endl;

    //find minimum number
    int min=INT_MAX;
    for(int i=0;i<size;i++){
        if(arr[i]<min){
            min=arr[i];
        }
    }
    cout<<"minimum number is :"<<min<<endl;
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
maximum number is :9
minimum number is :5
```

Q_Extreme print

```
#include <iostream>
#include<limits.h>

using namespace std;

int main()
{
    int arr[5]={5,8,9,6,7};
    int size=5;
    int start=0;
    int end=size-1;
    while (start<=end)
    {
        if(start==end){
            cout<<arr[start]<<" ";
        }
        else{
            cout<<arr[start]<<" ";
            cout<<arr[end]<<" ";
        }
        start++;
        end--;
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
5 7 8 6 9
```

Q) reverse array

```
#include <iostream>
#include<limits.h>

using namespace std;

int main()
{
    int arr[5]={10,20,30,40,50};
    int size=5;
    int start=0;
    int end=size-1;
    while (start<=end)
    {
        swap(arr[start],arr[end]);
        start++;
        end--;
    }
    //print reverse array value
    for(int i=0;i<size;i++){
        cout<<arr[i]<<" ";
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
50 40 30 20 10
```

Arrays – Class 2

```
#include <iostream>
#include<vector>

using namespace std;

int main()
{
    vector<int>arr;
    arr.push_back(5);
    arr.push_back(9);
    for(int i=0;i<arr.size();i++){
        cout<<arr[i]<<" ";
    }
    cout<<endl;
    cout<<"-----"<<endl;

    vector<int>arr2(5,-8);
    for(int i=0;i<arr2.size();i++){
        cout<<arr2[i]<<" ";
    }
    cout<<endl;
    cout<<"-----"<<endl;

    vector<int>arr3{2,5,8,9,3};
    for(int i=0;i<arr3.size();i++){
        cout<<arr3[i]<<" ";
    }
    cout<<endl;
    cout<<"-----"<<endl;

    cout<<"enter n value "<<endl;
    int n;
    cin>>n;
    vector<int>arr4(n);
    for(int i=0;i<arr4.size();i++){
        cout<<arr4[i]<<" ";
    }
    cout<<endl;
    cout<<"-----"<<endl;

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
5 9
```

```
-----  
-8 -8 -8 -8 -8
```

```
-----  
2 5 8 9 3
```

```
-----  
enter n value
```

```
5
```

```
0 0 0 0 0
```

```
-----
```

Q)find unique elements

```
#include <iostream>
#include<vector>

using namespace std;
int findUnique( vector<int>arr){
    int ans=0;
    for(int i=0;i<arr.size();i++){
        ans=ans^arr[i];
    }
    return ans;
}
int main()
{
    int n;
    cout<<"enter size value : "<<endl;
    cin>>n;

    vector<int>arr(n);
    cout<<"enter vector elements : "<<endl;
    for(int i=0;i<arr.size();i++){
        cin>>arr[i];
    }
    int unique=findUnique(arr);
    cout<<"Unique element is "<<unique<<endl;
    return 0;
}
```

```
PS E:\C++Code> .\a.exe
enter size value :
5
11 22 11 22 33
Unique element is 33
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter size value :
5
enter vector elements :
1 2 3 2 1
Unique element is 3
```

Q)union of two array

```
#include <iostream>
#include<vector>

using namespace std;

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

    vector<int>ans;
    //insert arr value to ans
    for(int i=0;i<size;i++){
        ans.push_back(arr[i]);
    }

    //insert brr value to ans
    for(int i=0;i<size;i++){
        ans.push_back(brr[i]);
    }

    //print union of two array
    for(int i=0;i<ans.size();i++){
        cout<<ans[i]<<" ";
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
```

```
PS E:\C++Code> .\a.exe
```

```
1 2 3 4 5 6 7 8
```

Q) Intersection of 2 array's

```
#include <iostream>
#include<vector>

using namespace std;

int main()
{
    vector<int>arr{1,2,3,4,3,3,3,3,3};
    vector<int>brr{2,3,3,3,3};

    vector<int>ans;
    for(int i=0;i<arr.size();i++){
        int element=arr[i];
        for(int j=0;j<brr.size();j++){
            if(element==brr[j]){
                brr[j]=-1;
                ans.push_back(element);
                break;
            }
        }
    }

    //print
    cout<<"Intersection of 2 array :"<<endl;
    for(int i=0;i<ans.size();i++){
        cout<<ans[i]<<" ";
    }
    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
Intersection of 2 array :
2 3 3 3 3
```

Q)Union of unique value (without duplicate)

```
#include <iostream>
#include<vector>
#include<limits.h>
using namespace std;

int main()
{
    vector<int>arr{1,2,3,4,5,2,5};
    vector<int>brr{2,3,5,6,2,3};

    vector<int>ans;
    for(int i=0;i<arr.size();i++){
        for(int j=i+1;j<arr.size();j++){
            if(arr[i]==arr[j]){
                arr[i]=INT_MIN;
            }
        }
    }

    for(int i=0;i<arr.size();i++){
        if(arr[i]!=INT_MIN){
            ans.push_back(arr[i]);
        }
    }

    for(int j=0;j<ans.size();j++){
        for(int k=0;k<brr.size();k++){
            if(ans[j]==brr[k]){
                brr[k]=INT_MIN;
            }
        }
    }

    for(int i=0;i<brr.size();i++){
        if(brr[i]!=INT_MIN){
            ans.push_back(brr[i]);
        }
    }
}
```

```
//print
cout<<" Union of 2 array :"<<endl;
for(int i=0;i<ans.size();i++){
    cout<<ans[i]<<" ";
}

return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
Union of 2 array :
1 3 4 2 5 6
```

Q)find pair of sum

```
#include <iostream>
#include<vector>
#include<limits.h>
using namespace std;

int main()
{
    int n;
    cout<<"enter size : "<<endl;
    cin>>n;
    vector<int>pair(n);
    cout<<"enter value : "<<endl;
    for(int i=0;i<pair.size();i++){
        cin>>pair[i];
    }

    for(int i=0;i<pair.size();i++){
        for(int j=i+1;j<pair.size();j++){
            if(pair[i]+pair[j]==9){
                cout<<"("<<pair[i]<<","<<pair[j]<<")"<<endl;
            }
        }
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter size :
7
enter value :
1 3 5 7 2 4 6
(3,6)
(5,4)
(7,2)
```

Q)find pair of triplet sum

```
#include <iostream>
#include<vector>
#include<limits.h>
using namespace std;

int main()
{
    int n;
    cout<<"enter size : "<<endl;
    cin>>n;
    vector<int>pair(n);
    cout<<"enter value : "<<endl;
    for(int i=0;i<pair.size();i++){
        cin>>pair[i];
    }

    for(int i=0;i<pair.size();i++){
        for(int j=i+1;j<pair.size();j++){
            for(int k=j+1;k<pair.size();k++){
                if(pair[i]+pair[j]+pair[k]==9){
                    cout<<"("<<pair[i]<<","<<pair[j]<<","<<pair[k]<<")"<<endl;
                }
            }
        }
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
enter size :
7
enter value :
1 3 5 7 2 4 6
(1,3,5)
(1,2,6)
(3,2,4)
```

Q) sort 0's and 1's

```
#include <iostream>
#include<vector>
#include<limits.h>
using namespace std;

int main()
{
    vector<int>arr{0,1,0,1,1,0,1,0,1,0};
    int start=0;
    int end=arr.size()-1;
    int i=0;
    while(start<=end){
        if(arr[i]==0){
            swap(arr[start],arr[i]);
            start++;
            i++;
        }
        else{
            swap(arr[end],arr[i]);
            end--;
        }
    }

    //print
    cout<<" sort 0's and 1's :"<<endl;
    for(int i=0;i<arr.size();i++){
        cout<<arr[i]<<" ";
    }

    return 0;
}
```

```
PS E:\C++Code> g++ .\f77.cpp
PS E:\C++Code> .\a.exe
sort 0's and 1's :
0 0 0 0 0 1 1 1 1 1
```
