

```

//upper triangular matrix
#include <iostream>
using namespace std;

int main()
{
    int r,i,j,count;
    count=0;
    int oned[50];
    int k=0;

    cout<<"Enter the order of the upper triangular square matrix: "<<endl;
    cin>>r;

    int arr[r][r];

    //input the matrix
    for(i=0;i<r;i++)
    {
        for(j=0;j<r;j++)
        {
            if (i<=j){
                cout<<"Enter element arr["<<i<<"]["<<j<<"] of matrix: "<<endl;
                cin>>arr[i][j];
            }
            else
                arr[i][j]=0;
        }
    }
    cout<<"The Matrix is:\n\n";

    //print the 2d matrix
    for(i=0;i<r;i++)
    {
        for(j=0;j<r;j++)
        {
            cout<<arr[i][j]<<"\t";

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

    cout<<"The following Matrix can be mapped to a 1D array as follows: \n\n";
    //Map 2d array to 1d array
    for(i=0;i<r;i++)
    {
        for(j=0;j<r;j++)
        {
            if(arr[i][j]!=0){
                oned[k]=arr[i][j];
                k++;
            }
        }
    }
    //Display 1d array
    for(i=0;i<k;i++)
        cout<<oned[i]<<"\t";

```

```

//Display 1d array
for(i=0;i<k;i++)
    cout<<oned[i]<<"\t";

int m,n,index;

cout<<"\n\n";
//Retrieving the elements
cout<<"\nEnter the rowno and colno of the element you want to retrieve: " ;
cin>>m>>n;
index = ((r*m)+n-(m*(m+1)/2)) ;
cout<<"\nThe element "<<arr[m][n]<<" is present in location "<<index<<endl;

return 0;

```

```
dse100@telnet:~/week2$ ./a.out
Enter the order of the upper triangular square matrix:
3
Enter element arr[0][0] of matrix:
1
Enter element arr[0][1] of matrix:
2
Enter element arr[0][2] of matrix:
3
Enter element arr[1][1] of matrix:
4
Enter element arr[1][2] of matrix:
5
Enter element arr[2][2] of matrix:
6
The Matrix is:

1      2      3
0      4      5
0      0      6

The following Matrix can be mapped to a 1D array as follows:

1      2      3      4      5      6

Enter the rowno and colno of the element you want to retrieve: 0 2
The element 3 is present in location 2
dse100@telnet:~/week2$
```