```cpp
//lower 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";

	int m,n,index;
```

```
	//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 retrive: " ;
	cin>>m>>n;

	index = (m*(m+1)/2+n) ;
	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[1][0] of matrix:
2
Enter element arr[1][1] of matrix:
3
Enter element arr[2][0] of matrix:
4
Enter element arr[2][1] of matrix:
5
Enter element arr[2][2] of matrix:
5
The Matrix is:

1       0       0
2       3       0
4       5       5


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

1       2       3       4       5       5


Enter the rowno and colno of the element you want to retrive: 2 1

The element 5 is present in location 4
```