Assignment Solutions | 2D Arrays - 1 | Week 6

1.Write a program to store 10 at every index of a 2D matrix with 5 rows and 5 columns.
Solution :

```
#include<iostream>
using namespace std;
int main(){
int matrix[5][5];
for(int i=0;i<5;i++){
for(int j=0;j<5;j++){
matrix[i][j] = 10;
}
}
for(int i=0;i<5;i++){
for(int j=0;j<5;j++){
cout << matrix[i][j] << " ";
}
cout<<endl;
}
}
```

2.Write a program to add two matrices and save the result in one of the given matrices.
Input 1:
1 2 3
4 5 6
7 8 9

4 5 8
0 0 8
1 2 0

Output 1:
5 7 11
4 5 14
8 10 9
Solution :

```
#include<iostream>
using namespace std;
int main(){
int n , m;
cout << "Enter the number of rows : ";
cin >> n;
cout << "Enter the number of columns : ";
cin >> m;
int a[n][m];
```

```
cout << "Enter the first matrix : "<<endl;
for(int i = 0 ; i < n ; i++){
for(int j = 0 ; j < m ; j++){
cin >> a[i][j];
}
}
int b[n][m];
cout << "Enter the second matrix : "<<endl;
for(int i = 0 ; i < n ; i++){
```

Q3: Given a matrix 'A' of dimension n x m and 2 coordinates (l1, r1) and (l2, r2). Return the sum of the
rectangle from (l1,r1) to (l2, r2).
Input 1:
1 2 -3 4
0 0 -4 2
1 -1 2 3
-4 -5 -7 0
l1 = 1, r1 = 2 , l2 = 3 , r2 = 3
Output 1: -4
Input 2:
1 2 -3 4
0 0 -4 2
1 -1 2 3
-4 -5 -7 0
l1 = 1, r1 = 0 , l2 = 0 , r2 = 3
Output 1: 2
Solution :

```
#include<iostream>
using namespace std;
int main(){
int n,m;
cout << "Enter the number of rows : ";
cin >> n;
cout << "Enter the number of columns : ";
cin >> m;
int a[n][m];
cout << "Enter the matrix element : ";
for(int i = 0 ; i < n ; i++){
for(int j = 0 ; j < m ; j++){
cin >> a[i][j];
}
}
int l1 , l2 , r1 , r2;
cout << "Enter the value of l1 coordinate : ";
cin >> l1;
```

Q4: Write a C++ program to find the largest element of a given 2D array of integers.
Input 1:
1 3 4 6
2 4 5 7
3 5 6 8

4 6 7 9
Output 1: 9
Solution :

```
#include<iostream>
using namespace std;
int main(){
int n , m;
cout << "Enter the number of rows : ";
cin >> n;
cout << "Enter the number of columns : ";
cin >> m;
int a[n][n];
cout << "Enter the matrix elements : ";
for(int i = 0 ; i < n ; i++){
for(int j = 0 ; j < m ; j++){
cin >> a[i][j];
}
}
int maximum = -1000000;
for(int i = 0 ; i < n ; i++){
```

Q5: Write a program to print the row number having the maximum sum in a given matrix.
Input 1:
1 3 5 7
3 4 7 8
1 4 12 3
Output 1: 2
Explanation : The 2nd row has the maximum sum i.e. 1+4+12+3 = 20
Solution :

```
#include<iostream>
using namespace std;
int main(){
int n , m;
cout << "Enter the number of rows : ";
cin >> n;
cout << "Enter the number of columns : ";
cin >> m;
int a[n][n];
cout << "Enter the matrix elements : ";
```

```
for(int i = 0 ; i < n ; i++){
for(int j = 0 ; j < m ; j++){
cin >> a[i][j];
}
}
int maximum = -1000000;
int rowNumber = -1;
```

Q6: Write a function which accepts a 2D array of integers and its size as arguments and displays the
elements of middle row and the elements of middle column.
[Assuming the 2D Array to be a square matrix with odd dimensions i.e. 3x3, 5x5, 7x7 etc...]
Input 1:
1 2 3 4 5
3 4 5 6 7
7 6 5 4 3
8 7 6 5 4
1 2 37 8 0
Output 1:

3
5
7 6 5 4 3
6
37
Solution :

```
#include<iostream>
using namespace std;
int main(){
int n;
cout << "Enter the number of rows : ";
cin >> n;
int a[n][n];
cout << "Enter the matrix elements : ";
for(int i = 0 ; i < n ; i++){
for(int j = 0 ; j < n ; j++){
cin >> a[i][j];
}
}
cout << "The elements of the middle row and middle column are as follows :
"<<endl;
int i,j;
for(i = 0 ; i < n ; i++){
for(int j = 0 ; j < n ; j++){
if(i == n/2 or j == n/2)cout<<a[i][j]<<" ";
```