Assignment - 2

Problem -1 :- Solution(code)

```cpp
#include <bits/stdc++.h>
using namespace std;

int main(){
    int n,m;
    cin>>n>>m;
    int arr[n][m];
    for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
            cin>>arr[i][j];
        }

    }
    cout<<"Original Matrix :-";
    cout<<endl;
    cout<<endl;
    for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
            cout<<arr[i][j]<<" ";
        }cout<<endl;

    }cout<<endl;
    cout<<endl;
    cout<<"wave Matrix :-";
    cout<<endl;
    cout<<endl;
    for(int j=0;j<n;j++){
        if(j%2==0){
            for (int i = 0; i < m; i++)
            {
                cout<<arr[i][j]<<" ";
            }
        }else{
            for (int i = m-1; i >= 0; i--)
            {
                cout<<arr[i][j]<<" ";
            }
        }cout<<endl;
    }
}
```

Problem-1 Output

```
2
3
1
2
3
4
5
6
Original Matrix :-

1 2 3
4 5 6


transpose Matrix :-

1 4
2 5
3 6
PS D:\OneDrive - galgotiasuniversity.edu.in\Desktop\DSA for life\Class>
```

Problem - 2 Solution (code)

```cpp
#include <bits/stdc++.h>
using namespace std;

int main(){
    int n,m;
    cin>>n>>m;
    int arr[n][m];
    for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
            cin>>arr[i][j];
        }

    }
    cout<<"Original Matrix :-";
    cout<<endl;
    cout<<endl;
    for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
            cout<<arr[i][j]<<" ";
        }cout<<endl;

    }cout<<endl;
    cout<<endl;
    cout<<"transpose Matrix :-";
    cout<<endl;
    cout<<endl;
    for(int j=0;j<m;j++){
        for (int i = 0; i < n; i++)
        {
            cout<<arr[i][j]<<" ";
        }cout<<endl;

    }
}
```

Problem-2 Output

```
2
3
1
2
3
4
5
6
Original Matrix :-

1 2 3
4 5 6


transpose Matrix :-

1 4
2 5
3 6
PS D:\OneDrive - galgotiasuniversity.edu.in\Desktop\DSA for life\Class>
```

Problem-3 Solution (Code)

```cpp
#include <bits/stdc++.h>
using namespace std;

int main(){
    int n,m;
    cin>>n>>m;
    int arr[n][m];
    int count=1;
    for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
           arr[i][j]=count;
           count++;
        }

    } cout<<endl;
     cout<<endl;
     cout<<"Original matrix:-"<<endl;
      cout<<endl; cout<<endl;
     for(int i=0;i<n;i++){
        for (int j = 0; j < m; j++)
        {
           cout<<arr[i][j]<<" ";
        }cout<<endl;

    }  cout<<endl;
     cout<<endl;
      cout<<endl;
      cout<<"spiral traversion:-"<<endl;
      cout<<endl;
    int a=0;
    int b=m-1;
    int c=n-1;
    int d=0;
    while(a<=b && d<=c){
        for(int i=a;i<=b;i++){
            cout<<arr[d][i]<<" ";
        }d++;
        for(int i=d;i<=c;i++){
            cout<<arr[i][b]<<" ";
        }b--;
        if(d<=c){
        for(int i=b;i>=a;i--){
            cout<<arr[c][i]<<" ";
        }c--;}
        if(a<=b){
        for(int i=c;i>=d;i--){
            cout<<arr[i][a]<<" ";
        }a++;}
    }
}
```

Problem-3 Output:-

```
4
4


Original matrix:-


1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16


spiral traversion:-

1 2 3 4 8 12 16 15 14 13 9 5 6 7 11 10
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```

Problem-4 Solution

```cpp
#include <bits/stdc++.h>
using namespace std;

int main(){
    int n;
    cin>>n;
    int arr[n][n];
    int count=1;
    for(int i=0;i<n;i++){
        for (int j = 0; j < n; j++)
        {
           arr[i][j]=count;
           count++;
        }

    } cout<<endl;
     cout<<endl;
     cout<<"Original matrix:-"<<endl;
      cout<<endl; cout<<endl;
     for(int i=0;i<n;i++){
        for (int j = 0; j < n; j++)
        {
           cout<<arr[i][j]<<" ";
        }cout<<endl;

    }  cout<<endl;
     cout<<endl;
      cout<<"rotated matrix:-"<<endl;
                cout<<endl;
            int i=0;
                    while(i<n){
            for(int a=i+1;a<n;a++){
                swap(arr[i][a],arr[a][i]);
            }i++;
        }
        for(int i=0;i<n;i++){
            int j=n-1;
            int k=0;
            while(k<=j){
            swap(arr[i][k],arr[i][j]);
            k++;
            j--;
            }
        } for(int i=0;i<n;i++){
        for (int j = 0; j < n; j++)
        {
           cout<<arr[i][j]<<" ";
        }cout<<endl;

}}
```

Problem-4 Output

```
3


Original matrix:-


1 2 3
4 5 6
7 8 9


rotated matrix:-

7 4 1
8 5 2
9 6 3
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```