Question 1

Create a program which has an array its length=10

Note: Store the length in a variable then deal with this variable, arr[length] and in the loop i < length and so on

Take the values of the array from the user.

Print the values of the array and put space between each element.

Print the values of the array and put space between each element (Reversed).

Print the Summation of the elements of this array.

Print the Product of the elements of this array.

```cpp
// THE LAST EDITION
#include<iostream>
using namespace std;

int main(){
    int length = 10;
    int arr[length];
    int n;
    int Summation= 0;
    int Product = 1;
    for(int i=0 ; i<length; i++){
        cout<<"Please enter element "<<i+1<<" : ";
        cin>>n;
        arr[i] = n;
        Summation += arr[i];
        Product *= arr[i];
    }
    cout<<"          \n";
    cout<<"The elements of ur array is : ";
    for(int m=0; m<length ; m++){
        if(arr[m] != length-1) {
        cout<<arr[m]<<" ";
    }
```

```cpp
    if(arr[m]==length-1){
        cout<<arr[m]<<"\n";           // fe problem hena mabyamelsh
new line 3la elraghm men "\n"
    }
    }
    cout<<"\n";                        // we traied to solve this
problem using this block
    cout<<"The elements of ur array reversed is : ";
    for(int r=length-1; r>=0 ; r--){
        cout<<arr[r]<<" ";
    }
    cout<<"\n";
cout<<"The Summation of elements is : "<<Summation<<endl;
cout<<"The product of elements is : "<<Product<<endl;
cout<<"          \n";
}
```

Test

```
Please enter element 1 : 1
Please enter element 2 : 2
Please enter element 3 : 3
Please enter element 4 : 1
Please enter element 5 : 2
Please enter element 6 : 4
Please enter element 7 : 5
Please enter element 8 : 4
Please enter element 9 : 3
Please enter element 10 : 2

The elements of ur array is : 1 2 3 1 2 4 5 4 3 2
The elements of ur array reversed is : 2 3 4 5 4 2 1 3 2 1
The Summation of elements is : 27
The product of elements is : 5760
```

Question 2

Create a program which has an 2D array its rows=3, columns=3

Note: Store the rows, columns in a variables then deal with them, matrix[rows][columns] and in the loop i < rows, j < columns and so on

Take the values of the matrix from the user.

Print the values of the matrix and put space between each element, and go to new line after each row.

Print the Summation of each row of this matrix.

Print the Product of each row of this matrix.

```cpp
// THE LAST EDITION
#include <iostream>
using namespace std;

int main() {
    int rows, columns;

    cout << "Enter the number of rows: ";
    cin >> rows;
    cout << "Enter the number of columns: ";
    cin >> columns;

    int arr[rows][columns];

    // Input elements into the matrix
    for (int r = 0; r < rows; r++) {
        for (int c = 0; c < columns; c++) {
            cout << "Please enter element [" << r <<
"][" << c << "]: ";
            cin >> arr[r][c];
        }
```

```cpp
    }

    // Print the matrix elements
    cout << "The elements of your array are: " <<
endl;
    for (int r = 0; r < rows; r++) {
        for (int c = 0; c < columns; c++) {
            cout << arr[r][c] << " ";
        }
        cout << endl;
    }
    // Calculate and print the summation of each row
    cout << "The summation of each row is: " << endl;
    for (int r = 0; r < rows; r++) {
        int rowsum = 0;
        for (int c = 0; c < columns; c++) {
            rowsum += arr[r][c];
        }
        cout << "Sum of row " << r + 1 << ": " <<
rowsum << endl;
        }

    // Calculate and print the product of each row
    cout << "The product of each row is: " << endl;
    for (int r = 0; r < rows; r++) {
        int rowproduct = 1;    // 1 because it's a
product
        for (int c = 0; c < columns; c++) {
            rowproduct *= arr[r][c];
        }
```

```cpp
        cout << "Product of row " << r + 1 << ": " <<
rowproduct << endl;
    }


    return 0;
}
```

Test

```
Enter the number of rows: 2
Enter the number of columns: 3
Please enter element [0][0]: 2
Please enter element [0][1]: 5
Please enter element [0][2]: 6
Please enter element [1][0]: 4
Please enter element [1][1]: 8
Please enter element [1][2]: 2
The elements of your array are:
2 5 6
4 8 2
The summation of each row is:
Sum of row 1: 13
Sum of row 2: 14
The product of each row is:
Product of row 1: 60
Product of row 2: 64
```

Question 3

Create a program which has an 2D array its rows=3, columns=4

Note: Store the rows, columns in a variables then deal with them, matrix[rows][columns] and in the loop i < rows, j < columns and so on

 I want u to Transpose this matrix, What do u mean?

Make the Rows Columns and the Columns Rows

 Take The values of the matrix from the user.

Print the main Matrix. (space between each element and new line after each row)

Print the Transpose Matrix. (space between each element and new line after each row)

```cpp
// THE LAST EDITION
#include <iostream>
using namespace std;

int main() {
    int rows = 3;
    int columns = 4;

    int matrix[rows][columns];
    int transpose[columns][rows];

    // Take values of the matrix from the user
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < columns; j++) {
            cout << "Enter element [" << i << "][" <<
j << "]: ";
            cin >> matrix[i][j];
        }
    }
```

```cpp
    // Transpose the matrix
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < columns; j++) {
            transpose[j][i] = matrix[i][j];
        }
    }

    // Print the main matrix
    cout << "\nMain Matrix:\n";
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < columns; j++) {
            cout << matrix[i][j] << " ";
        }
        cout << endl;
    }

    // Print the transpose matrix
    cout << "\nTranspose Matrix:\n";
    for (int i = 0; i < columns; i++) {
        for (int j = 0; j < rows; j++) {
            cout << transpose[i][j] << " ";
        }
        cout << endl;
    }

    return 0;
}
```

Test

```
Enter element [0][0]: 3
Enter element [0][1]: 6
Enter element [0][2]: 8
Enter element [0][3]: 5
Enter element [1][0]: 2
Enter element [1][1]: 7
Enter element [1][2]: 1
Enter element [1][3]: 3
Enter element [2][0]: 6
Enter element [2][1]: 9
Enter element [2][2]: 8
Enter element [2][3]: 5

Main Matrix:
3 6 8 5
2 7 1 3
6 9 8 5

Transpose Matrix:
3 2 6
6 7 9
8 1 8
5 3 5
```

THANK YOU