Assignment 1

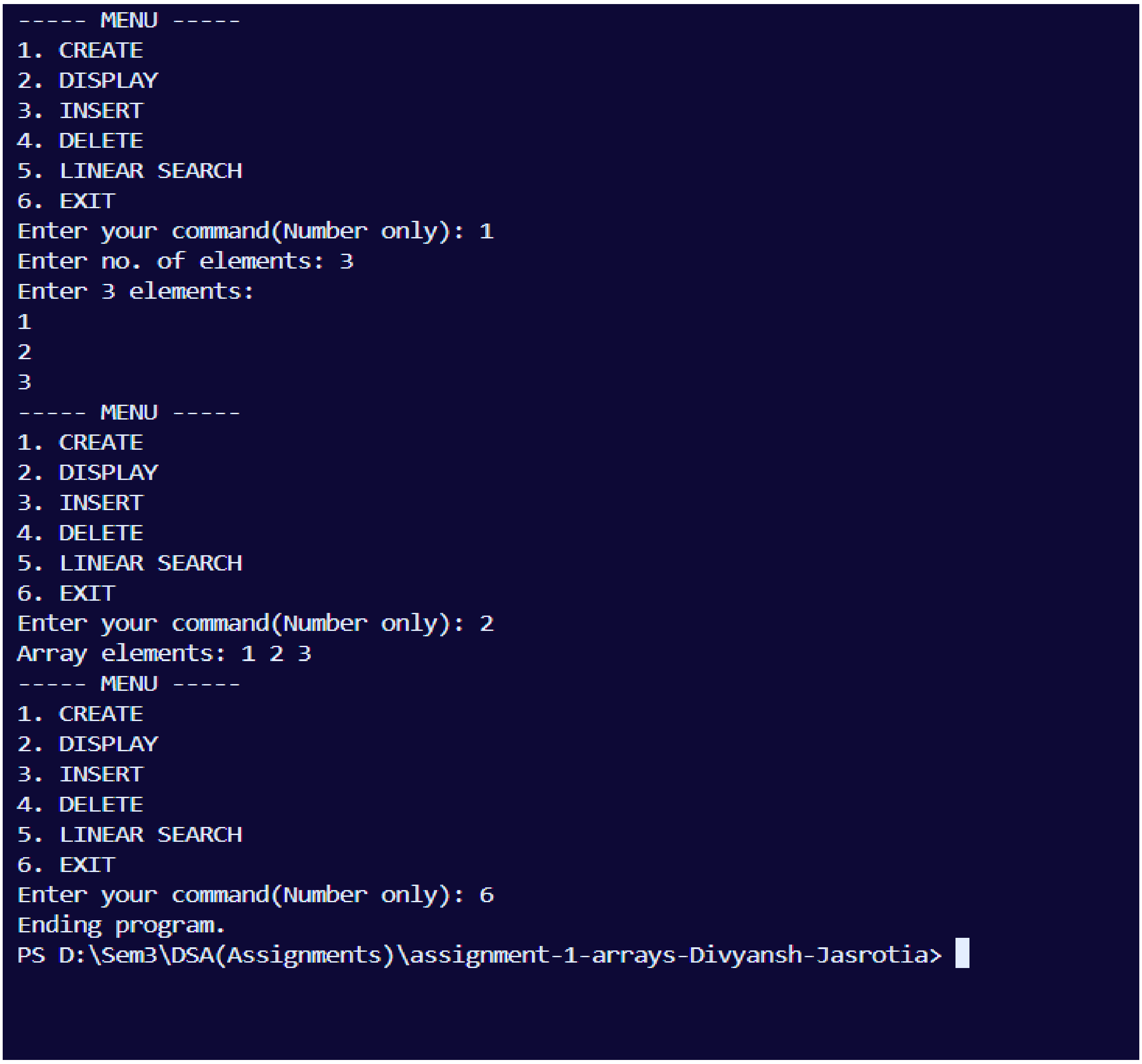
AQ1

```
#include <iostream>
using namespace std;

int main() {
   int arr[100];
   int n=0;
   int com, i, pos, x, found;

   while (true) {
      cout << "----- MENU -----\n";
      cout << "1. CREATE\n";
      cout << "2. DISPLAY\n";
      cout << "3. INSERT\n";
      cout << "4. DELETE\n";
      cout << "5. LINEAR SEARCH\n";
      cout << "6. EXIT\n";
      cout << "Enter your command(Number only): ";
      cin >> com;
```

```
if (com==1)
{
    cout << "Enter no. of elements: ";
    cin >> n;
    cout << "Enter " << n << " elements:\n";
    for (i = 0; i < n; i++) {
        cin >> arr[i];
    }
}
else if (com==2)
{
    if (n == 0)
        cout << "Array has no values.\n";
    else
    {
        cout << "Array elements: ";
        for (i = 0; i < n; i++)
            cout << arr[i] << " ";
        cout << endl;
    }
}
else if (com==3)
{
    cout << "Enter position (1 to " << n+1 << "): ";
    cin >> pos;
    cout << "Enter element: ";
    cin >> x;
    if (pos < 1 || pos > n+1)
    {
        cout << "Invalid position!\n";
    }
    else
    {
        for (i = n; i >= pos; i--) {
            arr[i] = arr[i - 1];
        }
        arr[pos - 1] = x;
        n++;
        cout << "Element inserted.\n";
    }
}
```

```
else if (com == 4)
{
    cout << "Enter position (1 to " << n << "): ";
    cin >> pos;
    if (pos < 1 || pos > n)
    {
        cout << "Invalid position!\n";
    }
    else
    {
        x = arr[pos - 1];
        for (i = pos - 1; i < n - 1; i++) {
            arr[i] = arr[i + 1];
        }
        n--;
        cout << "Element deleted: " << x << endl;
    }
}
else if (com == 5)
{
    cout << "Enter element to search: ";
```

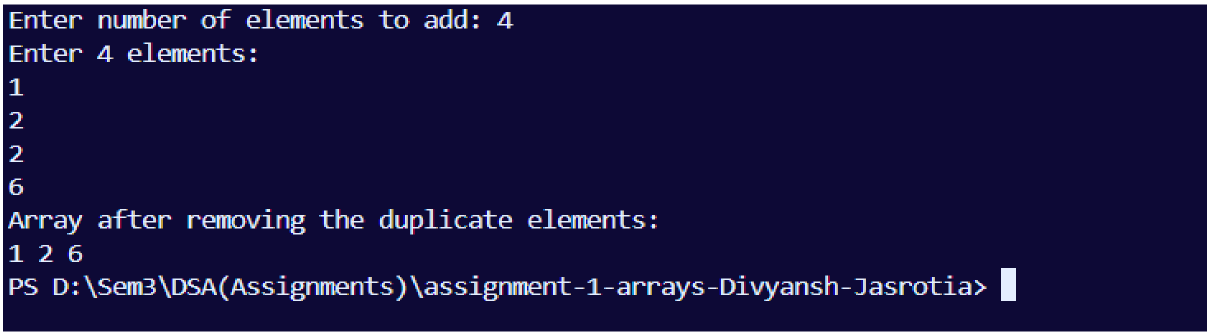
```
            cin >> x;

            found = -1;

            for (i = 0; i < n; i++)

            {

                if (arr[i] == x)

                {

                    found = i;

                    break;

                }

            }

            if (found == -1)

                cout << "Element not found.\n";

            else

                cout << "Element found at position " << found + 1
<< endl;

        }

        else if (com == 6)

        {

            cout << "Ending program.\n";

            break;

        }
        else
        {
            cout << "Invalid command! Enter Again.\n";
        }
    }
    return 0;
}
```



```
----- MENU -----
1. CREATE
2. DISPLAY
3. INSERT
4. DELETE
5. LINEAR SEARCH
6. EXIT
Enter your command(Number only): 1
Enter no. of elements: 3
Enter 3 elements:
1
2
3
----- MENU -----
1. CREATE
2. DISPLAY
3. INSERT
4. DELETE
5. LINEAR SEARCH
6. EXIT
Enter your command(Number only): 2
Array elements: 1 2 3
----- MENU -----
1. CREATE
2. DISPLAY
3. INSERT
4. DELETE
5. LINEAR SEARCH
6. EXIT
Enter your command(Number only): 6
Ending program.
PS D:\Sem3\DSA(Assignments)\assignment-1-arrays-Divyansh-Jasrotia>
```

AQ2

```
#include <iostream>
using namespace std;

int main() {
    int n;
    cout << "Enter number of elements to add: ";
    cin >> n;
    int arr[n];
    cout << "Enter " << n << " elements:\n";
    for (int i=0;i<n;i++)
    {
        cin >> arr[i];
    }
    for (int i=0;i<n;i++)
    {
        for (int j=i+1;j<n;j++)
        {
            if (arr[i] == arr[j])
            {
                for (int k=j;k<n-1;k++)
                {
                    arr[k]=arr[k + 1];
                }
                n--;
                j--;
            }
        }
    }
    cout << "Array after removing the duplicate elements:\n";
    for (int i=0;i<n;i++)
    {
        cout << arr[i] << " ";
    }
    cout << endl;
    return 0;
}
```



```
Enter number of elements to add: 4
Enter 4 elements:
1
2
2
6
Array after removing the duplicate elements:
1 2 6
PS D:\Sem3\DSA(Assignments)\assignment-1-arrays-Divyansh-Jasrotia>
```

AQ3

```
#include <stdio.h>
int main()
{
   int i;
   int arr[5]={1};
   for (i=0;i<5;i++)
      printf("%d",arr[i]);
   return 0;
}
//Output=10000
```

AQ4

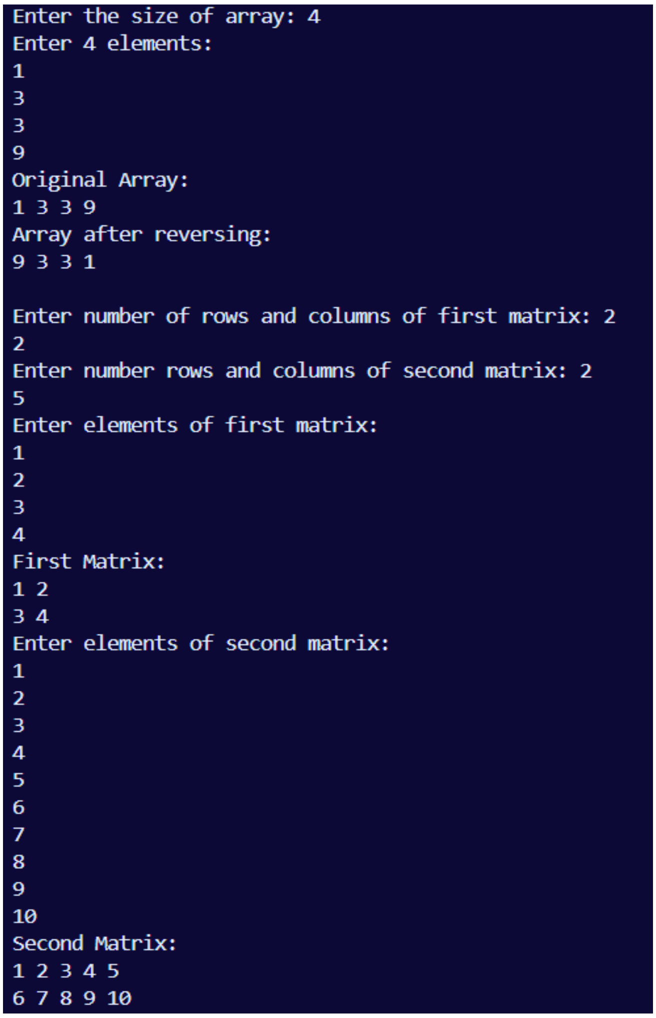
```
#include <iostream>
using namespace std;

int main()
{
   int len;
   cout << "Enter the size of array: ";
```

```
cin >> len;
int nums[len];
cout << "Enter " << len << " elements:\n";
for (int i=0;i<len;i++)

{
   cin >> nums[i];
}

cout << "Original Array:\n";
for (int i=0;i<len;i++)
{
   cout << nums[i] << " ";
}
cout << "\n";

for (int i=0;i<len/2;i++)
{
   int temp=nums[i];
   nums[i]=nums[len-1-i];
   nums[len-1-i]=temp;
```

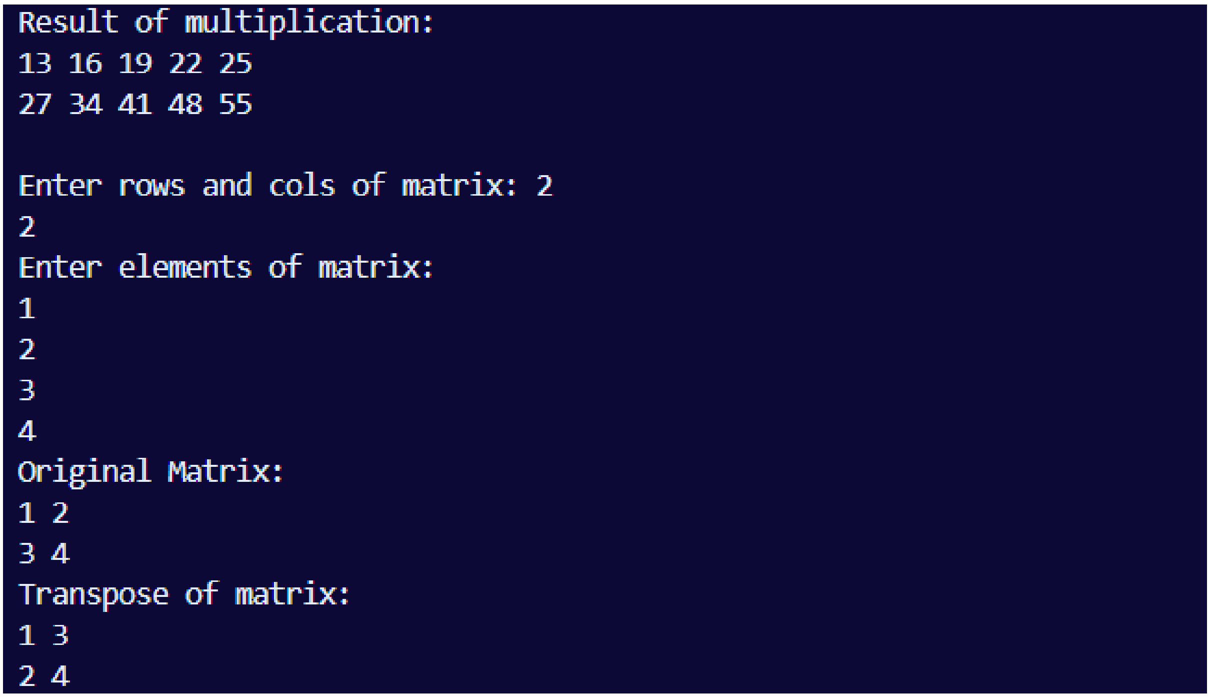
```
    }

    cout << "Array after reversing:\n";
    for (int i=0;i<len;i++)
    {
        cout << nums[i] << " ";
    }
    cout << "\n\n";

    int row1, col1, row2, col2;
    cout << "Enter number of rows and columns of first
matrix: ";
    cin >> row1 >> col1;
    cout << "Enter number rows and columns of second
matrix: ";
    cin >> row2 >> col2;

    if (col1!=row2)
    {
        cout << "Matrix multiplication is not possible!\n\n";
    }
    else
    {
        int mat1[row1][col1], mat2[row2][col2], result[row1][col2];
        cout << "Enter elements of first matrix:\n";
        for (int i=0;i<row1;i++)
        {
            for (int j=0;j<col1;j++)
            {
                cin >> mat1[i][j];
            }
        }
        cout << "First Matrix:\n";
        for (int i=0;i<row1;i++)
        {
            for (int j=0;j<col1;j++)
            {
                cout << mat1[i][j] << " ";
            }
            cout << endl;
        }
```

```
cout << "Enter elements of second matrix:\n";
for (int i=0;i<row2;i++)
{
    for (int j=0;j<col2;j++)
    {
        cin >> mat2[i][j];
    }
}
cout << "Second Matrix:\n";
for (int i=0;i<row2;i++)
{
    for (int j=0;j<col2;j++)
    {
        cout << mat2[i][j] << " ";
    }
    cout << endl;
}

for (int i=0;i<row1;i++)
{
    for (int j=0;j<col2;j++)
    {
        result[i][j] = 0;
    }
}
for (int i=0;i<row1;i++)
{
    for (int j=0;j<col2;j++)
    {
        for (int k=0;k<col1;k++)
        {
            result[i][j] += mat1[i][k] * mat2[k][j];
        }
    }
}
cout << "Result of multiplication:\n";
for (int i=0;i<row1;i++)
{
    for (int j=0;j<col2;j++)
    {
        cout << result[i][j] << " ";
        }
        cout << endl;
    }
    cout << "\n";
}

int rows, cols;
cout << "Enter rows and cols of matrix: ";
cin >> rows >> cols;
int matrix[rows][cols];
cout << "Enter elements of matrix:\n";
for (int i=0;i<rows;i++)
{
    for (int j=0;j<cols;j++)
    {
        cin >> matrix[i][j];
    }
}

cout << "Original Matrix:\n";
for (int i=0;i<rows;i++)
```

```
{
    for (int j=0;j<cols;j++)
    {
        cout << matrix[i][j] << " ";
    }
    cout << endl;
}

if (rows==cols)
{
    for (int i=0;i<rows;i++)
    {
        for (int j=i+1;j<cols;j++)
        {
            int temp=matrix[i][j];
            matrix[i][j]=matrix[j][i];
            matrix[j][i]=temp;
        }
    }
    cout << "Transpose of matrix:\n";
    for (int i=0;i<rows;i++)
    {
        for (int j=0;j<cols;j++)
        {
            cout << matrix[i][j] << " ";
        }
        cout << endl;
    }
}
else
{
    int transpose[cols][rows];
    for (int i=0;i<rows;i++)
    {
        for (int j=0;j<cols;j++)
        {
            transpose[j][i] = matrix[i][j];
        }
    }
    cout << "Transpose of matrix:\n";
    for (int i=0;i<cols;i++)
    {
            for (int j=0; j<rows;j++)
            {
                cout << transpose[i][j] << " ";
            }
            cout << endl;
        }
    }
    return 0;
}
```



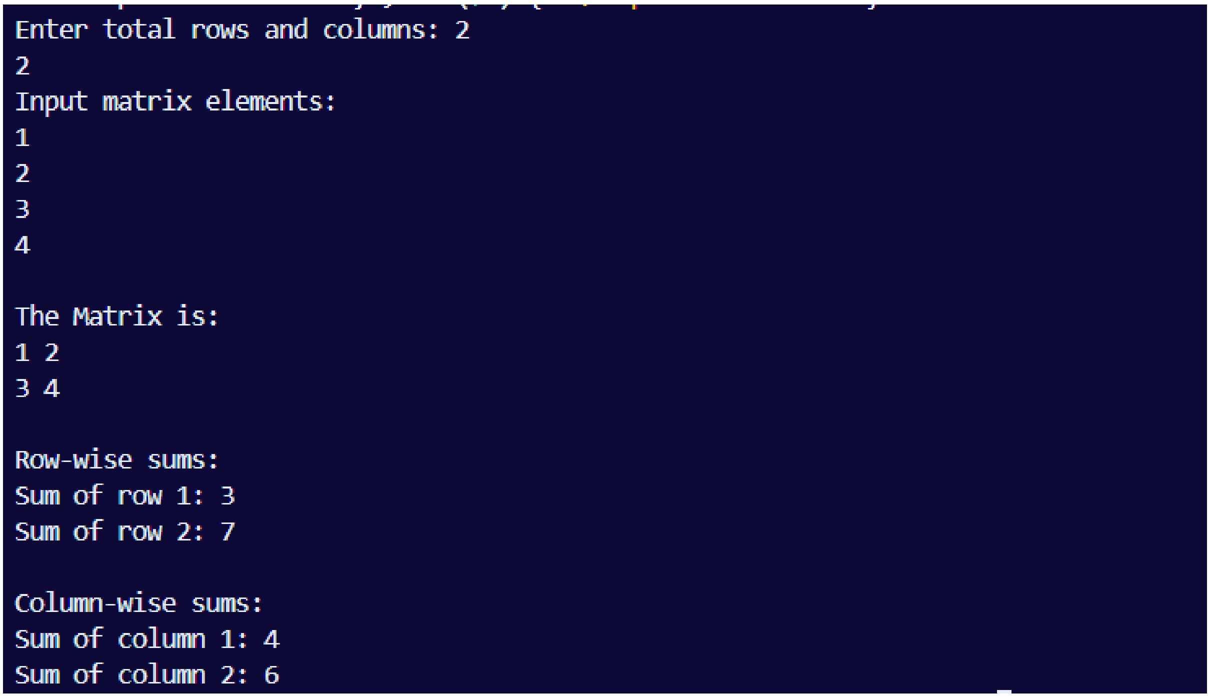
```
Enter the size of array: 4
Enter 4 elements:
1
3
3
9
Original Array:
1 3 3 9
Array after reversing:
9 3 3 1

Enter number of rows and columns of first matrix: 2
2
Enter number rows and columns of second matrix: 2
5
Enter elements of first matrix:
1
2
3
4
First Matrix:
1 2
3 4
Enter elements of second matrix:
1
2
3
4
5
6
7
8
9
10
Second Matrix:
1 2 3 4 5
6 7 8 9 10
```



```
Result of multiplication:
13 16 19 22 25
27 34 41 48 55

Enter rows and cols of matrix: 2
2
Enter elements of matrix:
1
2
3
4
Original Matrix:
1 2
3 4
Transpose of matrix:
1 3
2 4
```

AQ5

```
#include <iostream>
using namespace std;

int main() {
    int rows, cols;
    cout << "Enter total rows and columns: ";
    cin >> rows >> cols;
    int matrix[rows][cols];
    cout << "Input matrix elements:\n";
    for (int i=0;i<rows;i++) {
        for (int j=0;j<cols;j++) {
            cin >> matrix[i][j];
        }
    }
    cout << "\nThe Matrix is:\n";
    for (int i=0;i<rows;i++) {
        for (int j=0;j<cols;j++) {
            cout << matrix[i][j] << " ";
        }
        cout << endl;
    }
    cout << "\nRow-wise sums:\n";
    for (int i=0;i<rows;i++) {
        int sumRow = 0;
        for (int j=0;j<cols;j++) {
            sumRow += matrix[i][j];
        }
        cout << "Sum of row " << i + 1 << ": " << sumRow <<
endl;
    }
    cout << "\nColumn-wise sums:\n";
    for (int j=0;j<cols;j++) {
        int sumCol = 0;
        for (int i=0;i<rows;i++) {
            sumCol += matrix[i][j];
        }
        cout << "Sum of column " << j+1 << ": " << sumCol <<
endl;
    }
    return 0;}
```



```
Enter total rows and columns: 2
2
Input matrix elements:
1
2
3
4

The Matrix is:
1 2
3 4

Row-wise sums:
Sum of row 1: 3
Sum of row 2: 7

Column-wise sums:
Sum of column 1: 4
Sum of column 2: 6
```