AQ1

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

int main() {
  int arr[100], size = 0, choice = 0, pos, value, key, found;

  while(choice != 6) {
    cout << "MENU\n";
    cout << "1.CREATE\n2.DISPLAY\n3.INSERT\n4.DELETE\n5.LINEAR SEARCH\n6.EXIT\n";
    cout << "Enter your choice: ";
    cin >> choice;

    if(choice == 1) {
      cout << "Enter number of elements:";
      cin >> size;
      if(size > 100) {
        cout << "Maximum is 100";
        size = 100;
      }
      cout << "Enter elements:";
      for(int i = 0; i < size; ++i)
        cin >> arr[i];
    }
    else if(choice == 2) {
      if(size == 0)
        cout << "Array is empty";
      else {
        cout << "Array elements: ";
```

```
      for(int i = 0; i < size; ++i)
        cout << arr[i] << " ";
      cout << endl;
    }
  }
  else if(choice == 3) {
    if(size == 100) {
      cout << "Array is full. Cannot insert";
    }
    else {
      cout << "Enter posi: ";
      cin >> pos;
      if(pos < 0 || pos > size) {
        cout << "Invalid position";
      }
      else {
        cout << "Enter value to insert: ";
        cin >> value;
        for(int i = size; i > pos; --i)
          arr[i] = arr[i-1];
        arr[pos] = value;
        ++size;
        cout << "Element inserted";
      }
    }
  }
  else if(choice == 4){
    if(size == 0) {
      cout << "Array is empty";
    }
    else {
```

```
      cout << "Enter posi: ";
      cin >> pos;
      if(pos < 0 || pos >= size) {
        cout << "Invalid posi";
      }
      else {
        for(int i = pos; i < size-1; ++i)
          arr[i] = arr[i+1];
        --size;
        cout << "Element deleted";
      }
    }
  }
  else if(choice == 5) {
    if(size == 0) {
      cout << "Array is empty";
    }
    else {
      cout << "Enter element to search: ";
      cin >> key;
      found = -1;
      for(int i = 0; i < size; ++i) {
        if(arr[i] == key) {
          found = i;
          break;
        }
      }
      if(found != -1)
        cout << "Element found at index " << found << "\n";
      else
        cout << "Element not found";
```

```
        }
    }
    else if(choice == 6) {
        cout << "Exit";
    }
    else {
        cout << "Invalid choice";
    }
  }

  return 0;
}
```

```
PS C:\Users\PRAKHAR> cd "c:\Users\PRAKHAR\OneDrive\Documents\DSA_assignements_lab\assignment-1-arr
MENU
1.CREATE
2.DISPLAY
3.INSERT
4.DELETE
5.LINEAR SEARCH
6.EXIT
Enter your choice: 1
Enter number of elements:2
Enter elements:1
3
MENU
1.CREATE
2.DISPLAY
3.INSERT
4.DELETE
5.LINEAR SEARCH
6.EXIT
Enter your choice: 2
Array elements: 1 3
MENU
1.CREATE
2.DISPLAY
3.INSERT
4.DELETE
5.LINEAR SEARCH
6.EXIT
Enter your choice: 6
Exit
PS C:\Users\PRAKHAR\OneDrive\Documents\DSA_assignements_lab\assignment-1-arrays-Prakhar21-hack>
```

AQ2

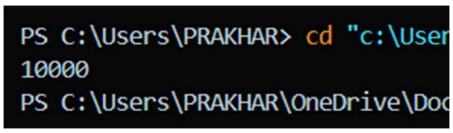
```
#include <iostream>
using namespace std;

int main()
{
   int n1;
   cout << "Enter number of elements: ";
   cin >> n1;
   int a1[n1];

   cout << "Enter " << n1 << " elements:";
   for(int i=0; i<n1; i++)
   {
      cin >> a1[i];
   }

   for(int i=0; i<n1; i++)
   {
      for(int j=i+1; j<n1; j++)
      {
         if(a1[i]==a1[j])
         {
            for(int k=j; k<n1-1; k++)
            {
               a1[k] = a1[k + 1];
            }
            n1--;
            j--;
```

```
        }
      }
    }
    cout << "Array after removing duplicates:";
    for(int i=0; i<n1; i++)
    {
       cout << a1[i] << " ";
    }
    cout << endl;

    return 0;
}
```

```
Enter number of elements: 4
Enter 4 elements:1
2
2
3
Array after removing duplicates:1 2 3
PS C:\Users\PRAKHAR\OneDrive\Documents\DSA_assignements_lab\assignment-1-arrays-Prakhar21-hack>
```

AQ3

```c
#include <stdio.h>

int main()

{

   int i;

   int arr[5] = {1};

   for (i = 0; i < 5; i++)

      printf("%d", arr[i]);

   return 0;

}
```



AQ4

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

int main(){
   int n; cout<<"Enter size of array:";
   cin>>n; int a1[n];
   cout<<"Enter "<<n<<" elements:\n";
   for(int i=0;i<n;i++) cin>>a1[i];

   cout<<"Original Array:\n";
   for(int i=0;i<n;i++) cout<<a1[i]<<" ";
   cout<<"\n";

   for(int i=0;i<n/2;i++) {
      int t=a1[i];
      a1[i]=a1[n-1-i];
      a1[n-1-i]=t;
   }

   cout<<"Array after reversing:\n";
   for(int i=0;i<n;i++) cout<<a1[i]<<" ";
   cout<<"\n\n";

   int r1,c1,r2,c2;
   cout<<"Enter rows and cols of first matrix:";
   cin>>r1>>c1;
   cout<<"Enter rows and cols of second matrix:";
   cin>>r2>>c2;
```

```
if(c1!=r2) cout<<"Matrix multiplication not possible!\n\n";
else {
  int A[r1][c1],B[r2][c2],C[r1][c2];
  cout<<"Enter elements of first matrix:\n";
  for(int i=0;i<r1;i++)
    for(int j=0;j<c1;j++) cin>>A[i][j];
  cout<<"First Matrix:\n";
  for(int i=0;i<r1;i++){
    for(int j=0;j<c1;j++) cout<<A[i][j]<<" ";
    cout<<"\n";
  }

  cout<<"Enter elements of second matrix:\n";
  for(int i=0;i<r2;i++)
    for(int j=0;j<c2;j++) cin>>B[i][j];
  cout<<"Second Matrix:\n";
  for(int i=0;i<r2;i++){
    for(int j=0;j<c2;j++) cout<<B[i][j]<<" ";
    cout<<"\n";
  }

  for(int i=0;i<r1;i++)
    for(int j=0;j<c2;j++) C[i][j]=0;
  for(int i=0;i<r1;i++)
    for(int j=0;j<c2;j++)
      for(int k=0;k<c1;k++)
        C[i][j]+=A[i][k]*B[k][j];

  cout<<"Result of multiplication:\n";
  for(int i=0;i<r1;i++){
```

```
      for(int j=0;j<c2;j++) cout<<C[i][j]<<" ";
      cout<<"\n";
   }
   cout<<"\n";
}

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

cout<<"Original Matrix:\n";
for(int i=0;i<r;i++){
   for(int j=0;j<c;j++) cout<<M[i][j]<<" ";
   cout<<"\n";
}

if(r==c){
   for(int i=0;i<r;i++)
      for(int j=i+1;j<c;j++){
         int t=M[i][j];
         M[i][j]=M[j][i];
         M[j][i]=t;
      }
   cout<<"Transpose of matrix:\n";
   for(int i=0;i<r;i++){
      for(int j=0;j<c;j++) cout<<M[i][j]<<" ";
      cout<<"\n";
```

```
    }
  }
  else{
    int T[c][r];
    for(int i=0;i<r;i++)
      for(int j=0;j<c;j++) T[j][i]=M[i][j];
    cout<<"Transpose of matrix:\n";
    for(int i=0;i<c;i++){
      for(int j=0;j<r;j++) cout<<T[i][j]<<" ";
      cout<<"\n";
    }
  }
  return 0;
}
```

```
PS C:\Users\PRAKHAR> cd "c:\Users\PRAK
Enter size of array:5
Enter 5 elements:
1
2
3
4
5
Original Array:
1 2 3 4 5
Array after reversing:
5 4 3 2 1
```

AQ5

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

int main(){
   int r1,c1;
   cout<<"Enter number of rows and columns:";
   cin>>r1>>c1;
   int a1[r1][c1];
   cout<<"Enter elements of the matrix:";
   for(int i=0;i<r1;i++)
      for(int j=0;j<c1;j++) cin>>a1[i][j];

   cout<<"Matrix:\n";
   for(int i=0;i<r1;i++){
      for(int j=0;j<c1;j++) cout<<a1[i][j]<<" ";
      cout<<"\n";
   }

   cout<<"Sum of each row:";
   for(int i=0;i<r1;i++){
      int s=0;
      for(int j=0;j<c1;j++) s+=a1[i][j];
      cout<<"Row "<<i+1<<": "<<s<<"\n";
   }

   cout<<"Sum of each column:";
   for(int j=0;j<c1;j++){
      int s=0;
```

```
    for(int i=0;i<r1;i++) s+=a1[i][j];
    cout<<"Column "<<j+1<<": "<<s<<"\n";
  }
  return 0;
}
```

```
Enter number of rows and columns:2
2
Enter elements of the matrix:1
2
3
4
Matrix:
1 2
3 4
Sum of each row:Row 1: 3
Row 2: 7
Sum of each column:Column 1: 4
Column 2: 6
PS C:\Users\PRAKHAR\OneDrive\Documents\DSA_assignements_lab\assignment-1-arrays-Prakhar21-hack>
```