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DSA ASSIGN 1

Q1)

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

int main() {
   int arr[100];
   int n = 0;
   int num;

   while (true) {
      cout << "\nEnter a number (1-6):" << endl;
      cout << "1. Create array" << endl;
      cout << "2. Display array" << endl;
      cout << "3. Insert element" << endl;
      cout << "4. Delete element" << endl;
      cout << "5. Linear search" << endl;
      cout << "6. Exit" << endl;
      cout << "Enter your choice: ";
      cin >> num;

      switch (num) {
         case 1:
{
            cout << "Enter the size of the array: ";
            cin >> n;
            cout << "Enter " << n << " elements:" << endl;
            for (int i = 0; i < n; i++) {
               cin >> arr[i];
            }
            break;
         }
         case 2:
{
            if (n == 0) {
               cout << "Array not created yet." << endl;
            } else {
               cout << "Array elements are: ";
               for (int i = 0; i < n; i++) {
                  cout << arr[i] << " ";
```

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            }
            cout << endl;
        }
        break;
    }
    case 3:
{
        if (n == 0) {
            cout << "Array not created yet. Please create it first." << endl;
            break;
        }
        int pos, element;
        cout << "Enter the index to insert (0 to " << n << "): ";
        cin >> pos;
        if (pos < 0 || pos > n) {
            cout << "Invalid index!" << endl;
            break;
        }
        cout << "Enter the element to insert: ";
        cin >> element;
        for (int i = n; i > pos; i--) {
            arr[i] = arr[i - 1];
        }
        arr[pos] = element;
        n++;
        cout << "Updated array is: ";
        for (int i = 0; i < n; i++) {
            cout << arr[i] << " ";
        }
        cout << endl;
        break;
    }
    case 4:
{
        if (n == 0) {
            cout << "Array not created yet." << endl;
            break;
        }
        int pos;
        cout << "Enter the index to remove (0 to " << n - 1 << "): ";
        cin >> pos;
        if (pos < 0 || pos >= n) {
            cout << "Invalid index!" << endl;
            break;
```

```
            }
            for (int i = pos; i < n - 1; i++) {
                arr[i] = arr[i + 1];
            }
            n--;
            cout << "Updated array is: ";
            for (int i = 0; i < n; i++) {
                cout << arr[i] << " ";
            }
            cout << endl;
            break;
        }
        case 5: {
            if (n == 0) {
                cout << "Array not created yet." << endl;
                break;
            }
            int element;
            cout << "Enter the element to search: ";
            cin >> element;
            int pos1 = -1;
            for (int i = 0; i < n; i++) {
                if (arr[i] == element) {
                    pos1 = i;
                    break;
                }
            }
            if (pos1 == -1) {
                cout << "Element not found" << endl;
            } else{
                cout << "Element found at index: " << pos1 << endl;
            }
            break;
        }
        case 6: {
            cout << "Exiting program." << endl;
            return 0;
        }
        default:
            cout << "Invalid choice! Please enter between 1 and 6." << endl;
    }
  }
  return 0;
}
```

Q2)

```
#include<iostream>
using namespace std;
int main(){
   int a[]={2,3,5,2,4};
   int n =sizeof(a)/sizeof(a[0]);
   bool visited[n]={false};
   for(int i=0;i<n;i++){
      bool duplicate=false;
      if(visited[i]==true)
         continue;
      for(int j=i+1;j<n;j++){
         if(a[i]==a[j]){
            visited[j]=true;
            duplicate=true;
         }
      }
      if(duplicate)
         cout<<a[i]<<" is duplicate in the array\n";
   }
   cout << "Unique elements:\n";
   for (int i = 0; i < n; i++) {
      if (!visited[i]) {
         cout << a[i] << " ";
      }
   }
   return 0;
}
```

Q3) 10000

Q4) A

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

int main() {
   int arr[5] = {10, 20, 30, 40, 50};
   int n = 5;

   for (int i = 0; i < n / 2; i++) {
      int temp = arr[i];
      arr[i] = arr[n - 1 - i];
      arr[n - 1 - i] = temp;
   }
```

```
   for (int i = 0; i < n; i++)
      cout << arr[i] << " ";

   return 0;
}
```

B)

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

int main() {
   int a[2][2] = {{1, 2}, {3, 4}};
   int b[2][2] = {{5, 6}, {7, 8}};
   int c[2][2];

   for (int i = 0; i < 2; i++) {
      for (int j = 0; j < 2; j++) {
         c[i][j] = 0;
         for (int k = 0; k < 2; k++) {
            c[i][j] += a[i][k] * b[k][j];
         }
      }
   }

   for (int i = 0; i < 2; i++) {
      for (int j = 0; j < 2; j++)
         cout << c[i][j] << " ";
      cout << endl;
   }

   return 0;
}
```

C)

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

int main() {
   int a[2][3] = {{1, 2, 3}, {4, 5, 6}};
   int transpose[3][2];

   for (int i = 0; i < 2; i++) {
      for (int j = 0; j < 3; j++) {
```

```
            transpose[j][i] = a[i][j];
        }
    }

    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 2; j++)
            cout << transpose[i][j] << " ";
        cout << endl;
    }

    return 0;
}
```

Q5)

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

int main() {
    int rows, cols;
    int arr[10][10];

    cin >> rows >> cols;

    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            cin >> arr[i][j];
        }
    }

    for (int i = 0; i < rows; i++) {
        int rowSum = 0;
        for (int j = 0; j < cols; j++) {
            rowSum += arr[i][j];
        }
```

```
        cout << "Row " << i + 1 << " sum = " << rowSum << endl;
    }

    for (int j = 0; j < cols; j++) {
        int colSum = 0;
        for (int i = 0; i < rows; i++) {
            colSum += arr[i][j];
        }
        cout << "Column " << j + 1 << " sum = " << colSum << endl;
    }

    return 0;
}
```