**DSA LAB ASSIGNMENT SUBMISSION**

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**LAB 1 :**

Q1.

#include <iostream>

#include<stdlib.h>

using namespace std;

int a[20];

int k = 0;

void create(){

    cout<<"enter the number of elements : "<<endl;

    cin>>k;

    for(int i = 0;i<k;i++ ){

        cout<<"enter the element"<<endl;

        cin>>a[i];

    }

}

void display(){

    for(int i = 0;i<k;i++ ){

        cout<<a[i]<<endl;

    }

}

void insert(){

    int pos,element;

    cout<<"enter the position where element is to be inserted"<<endl;

    cin>>pos;

    cout<<"enter the element to be inserted"<<endl;

    cin>>element;

    for(int i = k-1;i>=pos;i--){

        a[i+1] = a[i];

    }

        a[pos] = element;

        k++;

}

void del(){

    cout<<"enter the position from where element is to be deleted"<<endl;

    int pos;

    cin>>pos;

    for(int i = pos;i<k-1;i++){

    a[i] = a[i+1];

    }

    k--;

}

void search(){

    int n,found;

    cout<<"enter the number to be searched"<<endl;

    cin>>n;

    for(int i =0;i<k;i++){

        if(a[i]==n){

            found = 1;

            break;

        }

        else{

            found = 0;

        }

    }

    if(found==1){

        cout<<"found"<<endl;

    }

    else{

        cout<<"not found"<<endl;

    }

}

void exits(){

    exit(0);

}

int main()

{while(1){

    int choice;

    cout<<"enter the choice"<<endl;

    cin>>choice;

  switch(choice){

      case 1 : create();

      break;

      case 2 : display();

      break;

      case 3 : insert();

      break;

      case 4 : del();

      break;

      case 5 : search();

      break;

      case 6 : exits();

      break;

  }

}

    return 0;

}

Output :

enter the choice

1

enter the number of elements :

3

enter the element

1

enter the element

2

enter the element

3

enter the choice

2

1

2

3

enter the choice

3

enter the position where element is to be inserted

2

enter the element to be inserted

4

enter the choice

2

1

2

4

3

enter the choice

2

1

2

4

3

enter the choice

4

enter the position from where element is to be deleted

2

enter the choice

2

1

2

3

enter the choice

5

enter the number to be searched

1

found

enter the choice

6

Q2.

#include<iostream>

using namespace std;

int remove\_duplicate\_elements(int arr[], int n)

{

if (n==0 || n==1)

return n;

int temp[n];

int j = 0;

int i;

for (i=0; i<n-1; i++)

if (arr[i] != arr[i+1])

temp[j++] = arr[i];

temp[j++] = arr[n-1];

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

arr[i] = temp[i];

return j;

}

int main()

{

int n;

cin >> n;

int arr[n];

int i;

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

{

cin >> arr[i];

}

n = remove\_duplicate\_elements(arr, n);

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

cout << arr[i] << " ";

return 0;

}

Output :

enter the size :

3

enter the elements :

2 4 4

2 4

Q3. //The ouput will be 1.

Q4 a) #include <iostream>

using namespace std;

int main(){

    int n = 9;

    int arr[9] = {2,5,6,4,7,8,3,6,4};

    int temp;

    for(int i = 0; i<n/2; i++){

        temp = arr[i];

        arr[i] = arr[n-i-1];

        arr[n-i-1] = temp;

    }

    for(int i = 0; i < n; i++){

        cout << arr[i] << " ";

    }

}

Output :

4 6 3 8 7 4 6 5 2

Q4 b) #include <iostream>

using namespace std;

int main()

{

int a[10][10],b[10][10],mul[10][10],r,c,i,j,k;

cout<<"enter the number of row=";

cin>>r;

cout<<"enter the number of column=";

cin>>c;

cout<<"enter the first matrix element=\n";

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

{

for(j=0;j<c;j++)

{

cin>>a[i][j];

}

}

cout<<"enter the second matrix element=\n";

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

{

for(j=0;j<c;j++)

{

cin>>b[i][j];

}

}

cout<<"multiply of the matrix=\n";

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

{

for(j=0;j<c;j++)

{

mul[i][j]=0;

for(k=0;k<c;k++)

{

mul[i][j]+=a[i][k]\*b[k][j];

}

}

}

//for printing result

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

{

for(j=0;j<c;j++)

{

cout<<mul[i][j]<<" ";

}

cout<<"\n";

}

return 0;

}

Output :

enter the number of row=2

enter the number of column=2

enter the first matrix element=

1

2

3

4

enter the second matrix element=

3

4

5

6

multiply of the matrix=

13 16

29 36

Q4 c)

#include<iostream>

using namespace std;

int main() {

   int transpose[10][10], r=3, c=2, i, j;

   int a[3][3] = { {1, 2} , {3, 4} , {5, 6} };

   cout<<"The matrix is:"<<endl;

   for(i=0; i<r; ++i) {

      for(j=0; j<c; ++j)

      cout<<a[i][j]<<" ";

      cout<<endl;

   }

   cout<<endl;

   for(i=0; i<r; ++i)

   for(j=0; j<c; ++j) {

      transpose[j][i] = a[i][j];

   }

   cout<<"The transpose of the matrix is:"<<endl;

   for(i=0; i<c; ++i) {

      for(j=0; j<r; ++j)

      cout<<transpose[i][j]<<" ";

      cout<<endl;

   }

   return 0;

}

Output :

The transpose of the matrix is:

1 3 5

2 4 6

Q5 . #include <iostream>

using namespace std;

int binarySearch(int arr[], int l, int r, int x)

{

    if (r >= l) {

        int mid = l + (r - l) / 2;

        if (arr[mid] == x)

            return mid;

        if (arr[mid] > x)

            return binarySearch(arr, l, mid - 1, x);

        if    (arr[mid] < x)

        return binarySearch(arr, mid + 1, r, x);

    }

    return -1;

}

int main(void)

{

    int n;

    cout<<"Enter the number of elements: ";

    cin>>n;

    int arr[n];

    cout<<"Enter your elements: ";

    for(int i = 0;i<n;i++)

    cin>>arr[i];

    int x;

    cout<<"Enter the element you want to search from the array: ";

    cin>>x;

    int result = binarySearch(arr, 0, n - 1, x);

    (result == -1) ? cout << "Element is not present in array"<<endl

                : cout << "Element is present at position number: " << result+1<<endl;

    return 0;

}

Output :

Enter the number of elements: 6

Enter your elements: 1 23 4 5 6 7

Enter the element you want to search from the array: 4

Element is present at position number: 3

Q6. #include<iostream>

using namespace std;

int main(){

    int temp;

    int a[7] = {64,34,25,12,22,11,90};

    for(int i = 0;i<7;i++){

        for(int j = i+1;j<10;j++){

            if(a[i]>a[j]){

                temp = a[i];

                a[i]=a[j];

                a[j]=temp;

            }

        }

    }

for(int i= 0;i<7;i++){

    cout<<a[i]<<" ";

}

}

Output :

11 12 22 25 34 64 90

Q7 . #include<iostream>

using namespace std;

int main()

{

    int a[5]={2,3,4,5,7},found=0;

    int n=a[0];

    for(int i=0;i<5;i++)

    {

        if(a[i]==n)

        {

            found=1;

        }

        else{

            cout<<"Number missing "<<n;

            break;

        }

        n+=1;

    }

}

Output :

Number missing 6