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**Experiment 1.1**

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**Student Name: Alasso Branch: BE-CSE**

**UID: Section/Group:**

**Date of performance: 10/08/2022 Subject name: Data Structures**

**AIM:**

Write a menu driven program that implement following operations (using separate

functions) on a linear array:

1. Insert a new element at end as well as at a given position.

2. Delete an element from a given whose value is given or whose position is given.

3. To find the location of a given element.

4. To display the elements of the linear array.

**CODE:**

*// Write a menu driven program that implement operations on a linear array*

#include <iostream>

using namespace std;

int main()

{

    bool exit = false;

    char YesNo;

    while (!exit)

    {

*// Menu Driven List*

        int n;

        cout << " \n \n1. Insert a new element at end as well as at a given position \n";

        cout << "2. Delete an element from a given whose value is given or whose position is given. \n";

        cout << "3. To find the location of a given element. \n";

        cout << "4. To display the elements of the linear array. \n \n";

        cout << "Select between 1 to 4: ";

        cin >> n;

*// Insert a new element at end as well as at a given position.*

        if (n == 1)

        {

            int ch;

            cout << " \n Type 0 for inserting element at the end \n";

            cout << "Type 1 for inserting element at specific position \n \n";

****            cin >> ch;

*// Inserting element at the end*

            if (ch == 0)

            {

                int size;

                int position, num, i;

                cout << "Enter number of elements - " << endl;

                cin >> size;

                int a[size];

                cout << "Enter the elements in the array - " << endl;

                for (int k = 0; k < size; k++)

                {

                    cin >> a[k];

                }

                cout << "Enter the element to insert - ";

                cin >> num;

                int l = size;

                a[l] = num;

                cout << "The new array is - " << endl;

                for (int j = 0; j < size + 1; j++)

                {

                    cout << a[j] << " ";

                }

            }

*// Inserting elements at specific position*

            else if (ch == 1)

            {

                int size;

                int position, number, i;

                cout << "Enter number of elements - " << endl;

                cin >> size;

                int a[size];

                cout << "Enter the elements in the array - " << endl;

                for (int k = 0; k < size; k++)

                {

                    cin >> a[k];

                }

                cout << "Enter the element to insert - ";

                cin >> number;

                cout << "Enter the position at which you want to insert the new element- ";

                cin >> position;

                if (position > size + 1)

                {

                    cout << "Insertion is not possible";

                }

                else

                {

                    for (i = size; i >= position; i--)

                    {

                        a[i] = a[i - 1];

                    }

                    a[i] = number;

                }

                cout << "The new array is - " << endl;

                for (int j = 0; j < size + 1; j++)

                {

                    cout << a[j] << " ";

                }

            }

            else

            {

                cout << "Invalid Input";

            }

        }

*// Delete an element from a given whose value is given or whose position is given.*

        else if (n == 2)

        {

            int size;

            int position, number, i;

            cout << "Enter number of elements - " << endl;

            cin >> size;

            int a[size];

            cout << "Enter the elements in the array - " << endl;

            for (int k = 0; k < size; k++)

            {

                cin >> a[k];

            }

            cout << "Enter the position - ";

            cin >> position;

            if (position >= size + 1)

            {

                cout << "Deletion not possible ! " << endl;

            }

            else

            {

                for (int c = position - 1; c <= size - 1; c++)

                {

                    a[c] = a[c + 1];

                }

            }

            cout << "The new array is - " << endl;

            for (int k = 0; k < size - 1; k++)

            {

                cout << a[k] << " ";

            }

        }

*// To find the location of a given element. i.e Searching*

        else if (n == 3)

        {

            int size;

            int position, number, i;

            cout << "Enter number of elements - " << endl;

            cin >> size;

            int a[size], fact = 0;

            cout << "Enter the elements in the array - " << endl;

            for (int k = 0; k < size; k++)

            {

                cin >> a[k];

            }

            cout << "Enter the number you want to search - ";

            cin >> number;

            for (int i = 0; i < size; i++)

            {

                if (number == a[i])

                {

                    fact = 1;

                    position = i + 1;

                }

            }

            if (fact == 1)

            {

                cout << "The number is found ! " << endl;

                cout << "It is at the position : " << position << endl;

            }

            else

            {

                cout << "The number is not in the array bro!" << endl;

            }

        }

*// Display elements of the array*

        else if (n == 4)

        {

            int size;

            int position, number, i;

            cout << "Enter number of elements - " << endl;

            cin >> size;

            int a[size], fact = 0;

            cout << "Enter the elements in the array - " << endl;

            for (int k = 0; k < size; k++)

            {

                cin >> a[k];

            }

*// Display array*

            cout << "The new array is - " << endl;

            for (int k = 0; k < size; k++)

            {

                cout << a[k] << " ";

            }

        }

        else

        {

            cout << "Invalid Number";

        }

*//Wish to continue or not*

        cout << " \n \n Do you want to continue? (Y or N) \n";

        cin >> YesNo;

        if (YesNo == 'N' || YesNo == 'n')

        {

            exit = true;

        }

    }

    system("pause");

    return 0;

}

**OUTPUT:**

****