# Computer Programming Lab

# CEN-392

# Program 2

## Code :-

```
#include <iostream>
using namespace std;
#define size 40

int InputNum()
{
    int newnum;
    cout << "Enter The Number : ";
    cin >> newnum;
    return newnum;
}

int InsertBeg(int arr[], int n)
{
```

```
    if (n == size)
    {
        cout << "Array Overflow!" << endl;
        return n;
    }

    n++;
    for (int i = n - 1; i > 0; i--)
    {
        arr[i] = arr[i - 1];
    }
    arr[0] = InputNum();
    return n;
}

int InsertEnd(int arr[], int n)
{
    if (n == size)
    {
        cout << "Array Overflow!" << endl;
        return n;
    }

    arr[n] = InputNum();
    n++;
    return n;
}

int InsertK(int arr[], int n)
{
    if (n == size)
```

```
    {
        cout << "Array Overflow!" << endl;
        return n;
    }
    int k;
    cout << "Enter The Position [ Accoring To 1 Based Indexing ] : "
;
    cin >> k;
    if (k > n + 1)
    {
        cout << "Invalid Input!" << endl;
        return n;
    }

    n++;
    for (int i = n; i >= k; i--)
    {
        arr[i] = arr[i - 1];
    }
    arr[k - 1] = InputNum();
    return n;
}

int DeleteBeg(int arr[], int n)
{
    if (n == 0)
    {
        cout << "Array Underflow!" << endl;
        return n;
    }
    for (int i = 1; i < n; i++)
    {
```

```
        arr[i - 1] = arr[i];
    }
    n--;
    return n;
}

int DeleteEnd(int arr[], int n)
{
    if (n == 0)
    {
        cout << "Array Underflow!" << endl;
        return n;
    }
    n--;
    return n;
}

int DeleteK(int arr[], int n)
{
    if (n == 0)
    {
        cout << "Array Underflow!" << endl;
        return n;
    }
    int k;
    cout << "Enter The Position [ Accoring To 1 Based Indexing ] : "
;
    cin >> k;
    if (k > n)
    {
        cout << "Invalid Input!" << endl;
        return n;
```

```
    }
    for (int i = k; i < n; i++)
    {
        arr[i - 1] = arr[i];
    }
    n--;
    return n;
}

int DeleteMulti(int arr[], int n)
{
    if (n == 0)
    {
        cout << "Array Underflow!" << endl;
        return n;
    }
    int del;
    cout << "Enter The Element To Be Deleted : ";
    cin >> del;
    bool chk = true;
    for (int i = 0; i < n; i++)
    {
        if (arr[i] == del)
        {
            chk = false;
            for (int j = i + 1; j < n; j++)
            {
                arr[j - 1] = arr[j];
            }
            i--;
            n--;
```

```
        }
    }
    if (chk)
        cout << "No Element Found In The Array" << endl;
    return n;
}

void Print(int arr[], int n)
{
    if (n == 0)
    {
        cout << "Array Is Empty!" << endl;
        return;
    }
    cout << "Array -> ";
    for (int i = 0; i < n; i++)
    {
        cout << arr[i] << " ";
    }
    cout << "    Size -> " << n;
    cout << endl;
}

void ShowMenu()
{
    cout << endl
         << "___Operations To Perform On Array___" << endl;
    cout << "1.Insert At The Beginning" << endl;
    cout << "2.Insert At The Kth Position" << endl;
    cout << "3.Insert At The End" << endl;
    cout << "4.Delete At The Beginning" << endl;
```

```
    cout << "5.Delete At The Kth Position" << endl;
    cout << "6.Delete At The End" << endl;
    cout << "7.Delete Particular Element" << endl;
    cout << "8.Exit" << endl;
    cout << "Enter Your Choice : ";
}

bool Options(int arr[], int *n)
{
    int opt;
    cin >> opt;
    if (opt >= 1 && opt <= 8)
    {
        cout << endl
             << "Operation " << opt << " Is Seleceted." << endl;
    }
    switch (opt)
    {
    case 1:
        *n = InsertBeg(arr, *n);
        break;
    case 2:
        *n = InsertK(arr, *n);
        break;
    case 3:
        *n = InsertEnd(arr, *n);
        break;
    case 4:
        *n = DeleteBeg(arr, *n);
        break;
    case 5:
```

```
            *n = DeleteK(arr, *n);
            break;
        case 6:
            *n = DeleteEnd(arr, *n);
            break;
        case 7:
            *n = DeleteMulti(arr, *n);
            break;
        case 8:
            return 0;
            break;
        default:
            cout << "Invalid Input!" << endl;
        }

        return 1;
}

int main()
{
    system("cls");
    int n;
    cout << "Enter The Size Of The Array : ";
    cin >> n;
    int arr[size];
    cout << "Enter The Element Of Array : ";
    for (int i = 0; i < n; i++)
    {
        cin >> arr[i];
    }
```

```
    while (true)
    {
        ShowMenu();
        if (!Options(arr, &n))
        {
            break;
        }
        Print(arr, n);
        cout << endl;
    }
    cout<<"Exiting..."<<endl;
    return 0;
}
```

# Output :-

```
Enter The Size Of The Array : 5
Enter The Element Of Array : 2 3 5 6 7

___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 1

Operation 1 Is Seleceted.
Enter The Number : 1
Array -> 1 2 3 5 6 7     Size -> 6


___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 2

Operation 2 Is Seleceted.
Enter The Position [ Accoring To 1 Based Indexing ] : 4
Enter The Number : 4
Array -> 1 2 3 4 5 6 7     Size -> 7
```

```
___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 3

Operation 3 Is Seleceted.
Enter The Number : 8
Array -> 1 2 3 4 5 6 7 8     Size -> 8


___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 4

Operation 4 Is Seleceted.
Array -> 2 3 4 5 6 7 8     Size -> 7


___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 5

Operation 5 Is Seleceted.
Enter The Position [ Accoring To 1 Based Indexing ] : 3
Array -> 2 3 5 6 7 8     Size -> 6
```

```
___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 6

Operation 6 Is Seleceted.
Array -> 2 3 5 6 7     Size -> 5


___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 7

Operation 7 Is Seleceted.
Enter The Element To Be Deleted : 5
Array -> 2 3 6 7     Size -> 4


___Operations To Perform On Array___
1.Insert At The Beginning
2.Insert At The Kth Position
3.Insert At The End
4.Delete At The Beginning
5.Delete At The Kth Position
6.Delete At The End
7.Delete Particular Element
8.Exit
Enter Your Choice : 8

Operation 8 Is Seleceted.
Exiting...
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```