FAIZAN CHOUDHARY

20BCS021

PROGRAMMING LAB

20th September 2021

CODE:

```
#include <iostream>
using namespace std;
int N;              //Global variable for max size

//FUNCTION DEFINITIONS
void display (int a[], int n)
{
   cout<<"\nArray elements:\n ";
   for (int i=0; i<n; i++)
   cout<<a[i]<<" ";
   cout<<endl;
}

int insertion_beg (int arr[], int ele, int size)
{
  if(size == N){
    cout<<"\nCannot Insert: OverFlow !\n";
    return size;
  }

  for(int i = size-1; i>=0; i--)
  {
    arr[i+1] = arr[i];
```

```
  }
  arr[0] = ele;
  size++;
  return size;
}

int insertion_end (int arr[], int ele, int size)
{
  if(size == N){
    cout<<"\nCannot Insert: OverFlow !\n";
    return size;
  }

  arr[size] = ele;
  size++;
  return size;
}

int insertion_pos(int arr[], int ele, int pos, int size)
{
  if(size == N){
    cout<<"\nCannot Insert: Overflow !\n";
    return size;
  }

  if(pos<0){
    cout<<"\nPlease enter a valid position\n";
    return size;
  }
  else if(pos>size-1){
    cout<<"\nCannot insert outside the bounds. Please enter a valid position\n";
```

```
    return size;
  }

  for(int i = size-1; i>=pos; i--){
    arr[i+1] = arr[i];
  }
  arr[pos] = ele;
  size++;

  return size;
}

int deletion_beg(int arr[], int size)
{
  if(size==0){
    cout<<"\nEmpty array!\n";
    return size;
  }
  for(int i = 0; i<size-1; i++){
    arr[i] = arr[i+1];
  }
  size--;
  return size;
}

int deletion_end(int arr[], int size)
{
  if(size==0){
    cout<<"\nUnderFlow! Empty array!\n";
    return size;
  }
```

```
  size--;
  return size;
}

int deletion_pos(int arr[], int pos, int size)
{
  if(size==0){
    cout<<"\nUnderFlow! Empty array!\n";
    return size;
  }

  if(pos<0)
  {
    cout<<"\nPlease enter a valid position to be deleted\n";
    return size;
  }
  else if(pos>size-1){
    cout<<"\nPlease enter a valid position to be deleted\n";
    return size;
  }

  for(int i = pos; i<size-1; i++){
    arr[i] = arr[i+1];
  }
  size--;
  return size;
}

int main()
{
    int ch, ele, index;
```

```
int size=0;
cout<<"FAIZAN CHOUDHARY\n20BCS021\n";
cout<<"\nEnter the maximum size of the array: ";
cin>>N;
int a[N];



while (1)
{
   A:
   cout<<"\n\nMENU:\n1. Insert element at beginning";
   cout<<"\n2. Insert element at end";
   cout<<"\n3. Insert element at a given index";
   cout<<"\n4. Delete element at beginning";
   cout<<"\n5. Delete element at end";
   cout<<"\n6. Delete element at a given index";
   cout<<"\n7. Exit";
   cout<<"\nEnter your choice: ";
   cin>>ch;
   switch (ch)
   {
      case 1: cout<<"\nEnter element to be inserted at beginning: ";
            cin>>ele;
            size= insertion_beg(a,ele,size);
            display (a,size);
            break;
      case 2: cout<<"\nEnter element to be inserted at end: ";
            cin>>ele;
            size= insertion_end (a,ele,size);
            display (a,size);
            break;
```

```
        case 3: cout<<"\nEnter element to be inserted at a given index: ";
                cin>>ele;
                cout<<"\nEnter index at which insertion to be carried out: ";
                cin>>index;
                size= insertion_pos (a,ele,index,size);
                display (a,size);
                break;
        case 4: cout<<"\nDeleting at the beginning...\n ";
                size= deletion_beg (a,size);
                display (a,size);
                break;
        case 5: cout<<"\nDeleting at end...\n ";
                size= deletion_end (a,size);
                display (a,size);
                break;
        case 6: cout<<"\nEnter index at which deletion to be carried out: ";
                cin>>index;
                size= deletion_pos (a,index,size);
                display (a,size);
                break;
        case 7: exit(0);
        default: cout<<"Wrong choice entered! Try again! ";
                 goto A;
      }
   }
   return 0;
}
```

OUTPUT:

```
FAIZAN CHOUDHARY
20BCS021

Enter the maximum size of the array: 10


MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 1

Enter element to be inserted at beginning: 1

Array elements:
 1
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 2

Enter element to be inserted at end: 2

Array elements:
 1 2
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 3

Enter element to be inserted at a given index: 0

Enter index at which insertion to be carried out: 0

Array elements:
 0 1 2
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 4

Deleting at the beginning...

Array elements:
 1 2
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 5

Deleting at end...

Array elements:
 1
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 2

Enter element to be inserted at end: 2

Array elements:
 1 2
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 2

Enter element to be inserted at end: 3

Array elements:
 1 2 3
```

```
MENU:
1. Insert element at beginning
2. Insert element at end
3. Insert element at a given index
4. Delete element at beginning
5. Delete element at end
6. Delete element at a given index
7. Exit
Enter your choice: 6

Enter index at which deletion to be carried out: 1

Array elements:
 1 3
```