**Program 2**

**Aim :** To make a menu driven program to perform basic array operations.

**Theory :** An array is a collection of items stored at contiguous memory locations. The idea is to store multiple items of the same type together. This makes it easier to calculate the position of each element by simply adding an offset to a base value, i.e., the memory location of the first element of the array. Array elements are homogenous and can be accessed using their indices.

**Algorithm :**

Insertion (at index k)

1. Start
2. If k is greater than n then

Print(“Insertion not possible at given index”).

Goto step 9.

1. Set i = n-1
2. Set n = n+1
3. Repeat next two steps while i >= k
4. Set arr[i+1] = arr[i]
5. Set i = i-1
6. Set arr[k] = value
7. Stop

Deletion (at index k)

1. Start
2. If k>=n then

Print(“Deletion not possible”)

Goto step 8

1. Set i = k
2. Repeat steps 5 and 6 while i<n
3. Set arr[i] = arr[i+1]
4. Set i = i+1
5. Set n = n-1
6. Stop

Update (at index k)

1. Start
2. If k>=n then

Print(“Updation not possible”)

Goto step 4

1. Set arr[k] = value
2. Stop

Search

1. Start
2. Set i = 0
3. Repeat steps 4 and 5 while i<n
4. If arr[i] = value then

Print(“i , arr[i]”)

Goto step 7

1. Set i = i+1
2. if i = n then

print(“Element not found”)

1. Stop.

**Program:**

#include <stdio.h>

#include <stdlib.h>

int n;

int arr[200];

void insert(){

int k,value;

printf("Enter insertion index : ");

scanf("%d",&k);

if(k>n){

printf("Invalid insertion\n");

return;

}

printf("Enter value : ");

scanf("%d",&value);

for(int i = n-1 ; i>=k ; i--){

arr[i+1] = arr[i];

}

arr[k] = value;

n+=1;

}

void delete(){

int k;

printf("Enter deletion index : ");

scanf("%d",&k);

if(k>n){

printf("Invalid deletion\n");

return;

}

for(int i = k ; i<n ; i++){

arr[i] = arr[i+1];

}

n--;

}

void update(){

int k,value;

printf("Enter updation index : ");

scanf("%d",&k);

if(k>=n){

printf("Invalid updation\n");

return;

}

printf("Enter value : ");

scanf("%d",&value);

arr[k] = value;

}

void search(){

int value;

printf("Enter element to search : ");

scanf("%d",&value);

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

if(arr[i] == value){

printf("Index : %d, Value : %d\n",i,value);

return;

}

}

printf("Element not found\n");

}

void traverse(){

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

printf("%d ",arr[i]);

}

printf("\n");

}

int main(){

printf("Enter size of array : ");

scanf("%d",&n);

printf("Enter array elements : ");

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

scanf("%d",&arr[i]);

}

int choice;

do{

printf("\n1. Insert\n");

printf("2. Delete\n");

printf("3. Update\n");

printf("4. Search\n");

printf("5. Traverse\n");

printf("6. Exit\n");

printf("\nEnter your choice : ");

scanf("%d",&choice);

switch (choice) {

case 1:

insert();

break;

case 2:

delete();

break;

case 3:

update();

break;

case 4:

search();

break;

case 5:

traverse();

break;

default:

break;

}

}while(choice <6);

return 0;

}

 

