Green University of Bangladesh

Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering

Semester: 3rd - Fall semester / Year:2022

BSc in CSE (Day)

LAB REPORT NO - 01

Course Title: Data Structure Lab

Course Code: CSE 106 / Section: DE-221

Lab Experiment Name : Array Operations.

Student Details

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Lab Date : 12 / 10 / 2022

Submission Date : 19 / 10 / 2022

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Lab Report Status

Marks: ..... Signature: .....

Comments: ..... Date: .....

❑ Tittle of the Lab Experiment :

Implement a C program for array insertion and deletion using function.

❑ Objectives :

- Insert operation is to insert one or more data elements into an array. Based on the requirement, a new element can be added at the beginning, end, or any given index of array.

- Deletion refers to removing an existing element from the array and re-organizing all elements of an array.

- A function is a block of code which only runs when it is called. You can pass data, known as parameters, into a function. Functions are used to perform certain actions, and they are important for reusing code: Define the code once, and use it many times.

- An array is defined as the collection of similar type of data items stored at contiguous memory locations. Arrays are the derived data type in C programming language which can store the primitive type of data such as int, char, double, float, etc.

1. **Implement a C program for array insertion and deletion. Be informed that, you have to use 2 functions one for insertion and one for deletion.**

Algorithm :

Step – 1 = Declear function prototype
-elementinsertion ()for element insertion
-elementdeletion() for element deletion

Step – 2 = The element;s insert and delete operation is done in the function definition part

Step- 3 = for element insertion -
we call the function as int elementinsertion(int a[100],int element , int i, int loc, int size)

- input array size
- input element's in the array by using loop

```
for(i=0;i<size;i++)
{
scanf("%d",&a[i]);
}
```

- print element's
- Enter a position to insert an element

```
scanf("%d",&loc);
loc--;
for(i=size-1;i>=loc;i--)
{
a[i+1]=a[i];
}
a[loc]=element;
```

- print List after Insertion

```
for(i=0;i<size+1;i++)
{
insert = printf("%d ",a[i]);
}
```

Step-4 = Return insert in main function as aarrayinsert function call

Step – 5 = For element deletion -
we call the function as int elementdeletion(int a[100],int size, int n,int i,int j)

- input array size
- input element's in the array by using loop

```
for(i=0;i<size;i++)
{
scanf("%d",&a[i]);
}
```

- print element's before deletion
- Enter an element to delete

```
scanf("%d",&n);
for(i=0;i<size;i++)
{
if(a[i]==n)
{
for(j=i;j<(size-1);j++)
{
a[j]=a[j+1];
}
break;
}
}
```

- print List after deletion

```
for(i=0;i<(size-1);i++)
{
delet = printf("%d ",a[i]);
}
```

Step – 6 = Return delet in main function as arraydelet function call

Step - 7 = Create catagorize choosing option by using SWITCH Statement

Step – 8 = Create two case operation,
- 1 case for element insertion and
- 2nd case for element deletion

Step – 9 = in case 1 operation call the function from function definition as array insertation and insert break otherhand in case 2 operation, call the function from function definition as array deletion and insert break

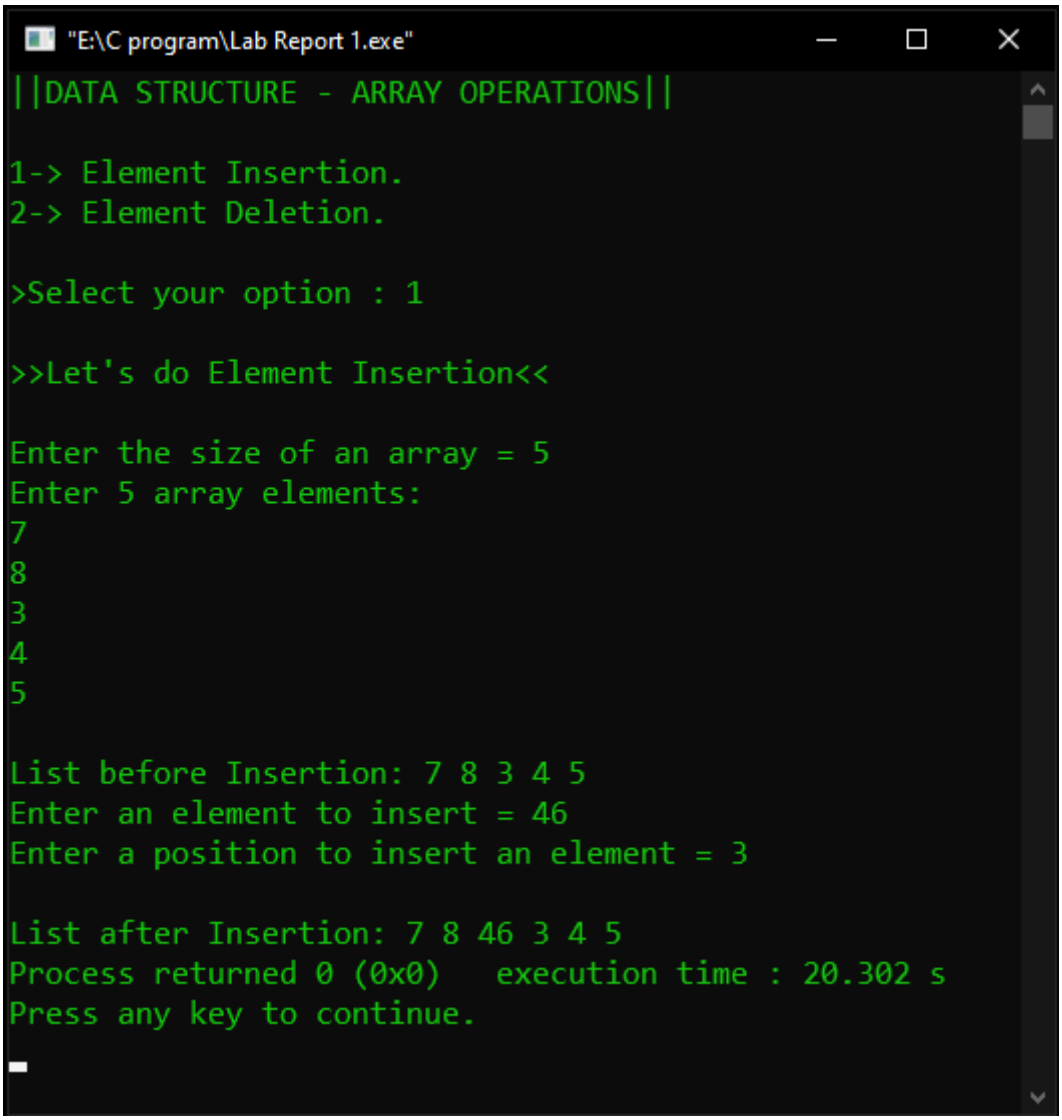
Code:

```
#include<stdio.h>

//function prototype's
int elementinsertion(int a[100],int element , int i, int loc, int size);
int elementdeletion( int a[100],int size, int n,int i,int j);

int main()
{
   int operation,arrayinsert,arraydelet;
   int a[100];
   int element;
   int i;
   int loc;
   int size;
   int n;
   int j;

/* telling the user to choose any option */
   printf("||DATA STRUCTURE - ARRAY OPERATIONS||\n");
   printf("\n1-> Element Insertion.\n");
   printf("2-> Element Deletion.\n");

   printf("\n>Select your option : ");
   scanf("%d",&operation);

   switch(operation)
   {
     case 1:                                        //case 1 for element insertion
       printf("\n>>Let's do Element Insertion<<\n\n");
       arrayinsert = elementinsertion(a,element,i, loc, size); //function call
       break;

     case 2:                                        //case 2 for element deletion
        printf("\n>>Let's do Element Insertion<<\n\n");
       arraydelet = elementdeletion(a,size,n,i,j);     //function call
       break;
   }
}
```

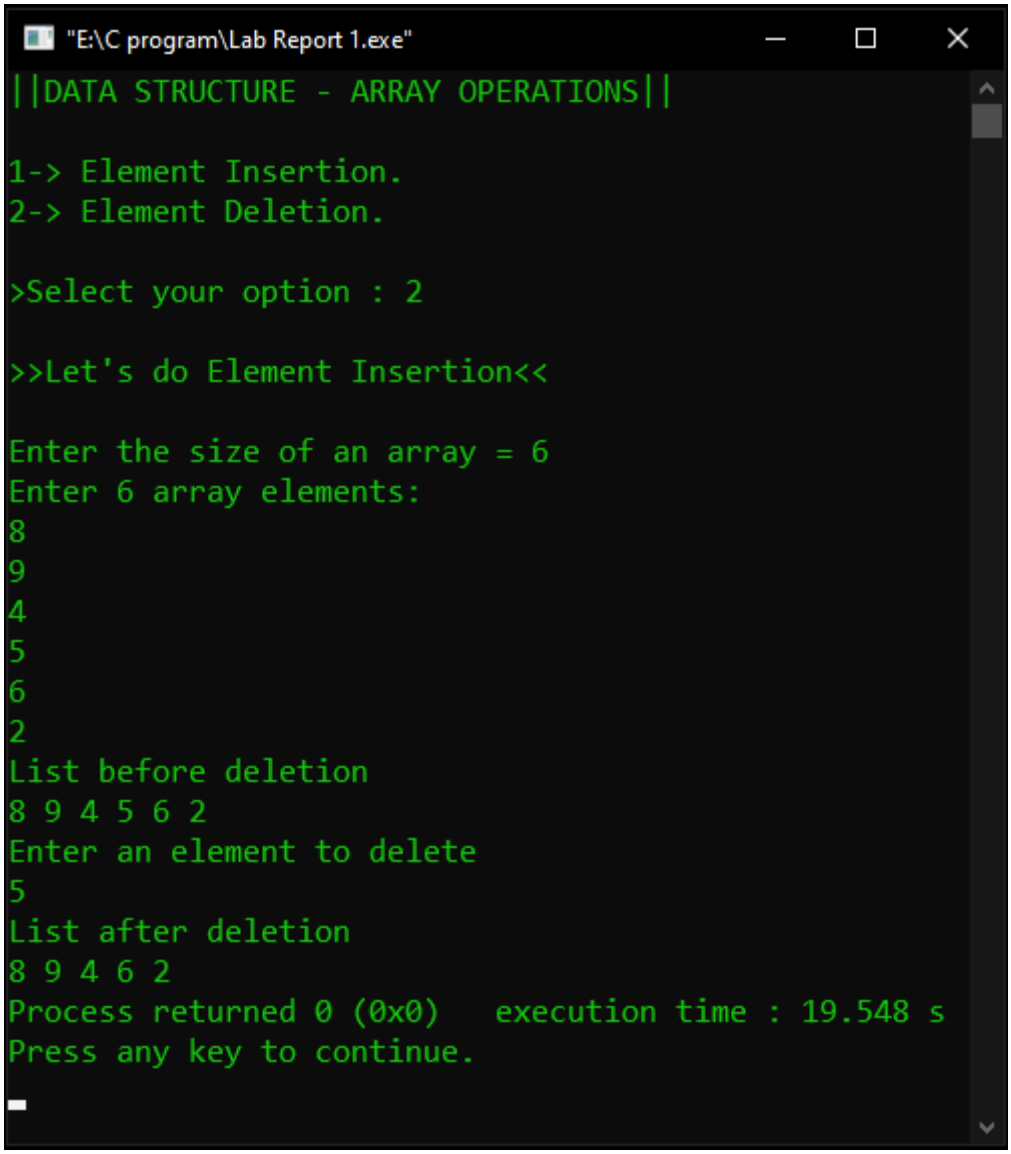
```
//function Definition
int elementinsertion(int a[100],int element , int i, int loc, int size) //insertion
   {
      int insert;

      printf("Enter the size of an array = ");
      scanf("%d",&size);
      printf("Enter %d array elements:\n",size);
      for(i=0;i<size;i++)
      {
      scanf("%d",&a[i]);
      }
      printf("\nList before Insertion: ");
      for(i=0;i<size;i++)
      {
      printf("%d ",a[i]);
      }
      printf("\nEnter an element to insert = ");
      scanf("%d",&element);
      printf("Enter a position to insert an element = ",element);
      scanf("%d",&loc);
      loc--;
      for(i=size-1;i>=loc;i--)
      {
      a[i+1]=a[i];
      }
      a[loc]=element;
      printf("\nList after Insertion: ");
      for(i=0;i<size+1;i++)
      {
      insert = printf("%d ",a[i]);
      }

      return insert;

}

int elementdeletion( int a[100],int size, int n,int i,int j) //deletion
{
   int delet;

   printf("Enter the size of an array = ");
   scanf("%d",&size);
```

```
printf("Enter %d array elements:\n",size);
   for(i=0;i<size;i++)
   {
      scanf("%d",&a[i]);
   }
   printf("List before deletion\n");
   for(i=0;i<size;i++)
   {
      printf("%d ",a[i]);
   }
   printf("\nEnter an element to delete\n");
   scanf("%d",&n);
   for(i=0;i<size;i++)
   {
      if(a[i]==n)
      {
         for(j=i;j<(size-1);j++)
         {
            a[j]=a[j+1];
         }
         break;
      }
   }
   printf("List after deletion\n");
   for(i=0;i<(size-1);i++)
   {
      delet = printf("%d ",a[i]);
   }
   return delet;
}
```

Output:



Case – 1 For Element's insertion



Case – 2 For Element's Deletion

❑ Analysis and Discussion :

- We got the exact result on output. Sometimes the result was wrong but we found the right implementation.
- The problem of displaying anything in output is the easiest implementation. We solve that very easily.
- In this assignment, we faced some problems in this question but with the teacher's help we solve it.
- All program is easy to understand and these helped me a lot to remove my confusion about c programming and array's operations.
- I learnt display something in program, Array operations as like array insertion and array deletion , switch statement and application of user-defined function etc on program and many basic things about c programming.