EXPERIMENT NO. 3

AIM: Write a program to insert and delete an element from the given array

SCOPE: The scope of the above C program is to demonstrate how to insert and delete elements in an array. The program allows the user to enter the size and elements of an array, insert a new element at a specific position, and delete an element at a specific position

FACILITIES: Software Needed: Turbo C

THEORY:

Insertion and deletion are fundamental operations performed on arrays. Arrays are data structures that store a collection of elements of the same data type in contiguous memory locations.

Insertion is the process of adding an element to an array at a specific position or index. To insert an element in an array, we need to shift all the elements after the insertion position to the right and create a space for the new element. This operation can be performed by iterating over the array using a loop and moving the elements to the right using the assignment operator. Once the space for the new element is created, we can insert the new element at the specified index.

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Insertion and deletion in arrays are important operations in many algorithms and data structures. For example, insertion and deletion are crucial operations in dynamic data structures such as lists, queues, and stacks. These operations can also be used in sorting algorithms to insert or delete elements in the array and maintain the order of the elements. In addition, these operations are commonly used in database management systems, where data is stored in arrays and needs to be manipulated frequently

IMPLEMENTATION:

```
#include <stdio.h>

#define MAX_SIZE 100

int main()
{
   int arr[MAX_SIZE], size, i, pos, value;

   printf("Enter the size of the array: ");
   scanf("%d", &size);

   printf("Enter %d elements of the array:\n", size);
   for(i=0; i<size; i++) {
      scanf("%d", &arr[i]);
   }

   // Insert an element
   printf("\nEnter the position and value to insert: ");
   scanf("%d %d", &pos, &value);
   for(i=size-1; i>=pos-1; i--) {
      arr[i+1] = arr[i];
   }
   arr[pos-1] = value;
   size++;

   // Delete an element
   printf("\nEnter the position of the element to delete: ");
   scanf("%d", &pos);
   for(i=pos-1; i<size-1; i++) {
      arr[i] = arr[i+1];
   }
   size--;

   printf("\nArray after insertion and deletion:\n");
   for(i=0; i<size; i++) {
      printf("%d ", arr[i]);
   }

   return 0;
}
```

Output:

Enter the size of the array: 5

Enter 5 elements of the array:
1
2
3
4
5
Enter the position and value to insert: 3 10

Enter the position of the element to delete: 5

Array after insertion and deletion:
1 2 10 3 4

RESULT: In this way we have Implemented and tested insertion and deletion from array.