ASSIGNMENT NO:1 **DATE:30/01/2015**

PROGRAM TITLE:Write a Program to delete the Duplicate elements from an Array.

THEORY: The aim of this program is to eliminate more than one instances of an element present in the array. In the result of the program, only one instance of each element should be present.

PROGRAM ALGORITHM:

```
Algo_duplicate(arr,length)
{
      for(i=0 to length-1)
      {
            for(j=i+1 to length-1)
            {
                  if(arr[j]=arr[i])
                  {
                        for(k=j to length-2)
                        {
                              arr[k]=arr[k+1];
                        }
                        n--;
                  }
                  else
                        j=j+1;
            }
      }
}
```

PROGRAM CODE:

```
/* C Program to delete the Duplicate elements from an array. */
#include <stdio.h>
#include <stdlib.h>
int duplicate(int *arr,int n);
int display(int *arr,int n);
int main()
{
      int n,i;

      /*Read inputs from the user*/
      printf("\n\tEnter size of array:");
      scanf("%d",&n);
      printf("\n\tEnter the elements:");

      /*Allocate space for the array*/
      int *arr=(int*)malloc(n*sizeof(int));

      /*Check if allocation successful or not*/
      if(!arr)
      {
            printf("\n\tAllocation failed");
            return 1;
```

```
	}
	for(i=0;i<n;i++)
	{
		scanf("%d",&arr[i]);
	}
	printf("\n\tArray before removing duplicate elements:");
	display(arr,n);
	printf("\n\tArray after removing duplicate elements:");

	/*Call function to remove duplicate elements*/
	n=duplicate(arr,n);
	return 0;
}

/*Function to remove duplicate elements*/
int duplicate(int *arr,int n)
{
	int i,j,k;
	for(i=0;i<n;i++)
	{
		for(j=i+1;j<n;)
		{
			if(arr[j]==arr[i])
			{
				for(k=j;k<n-1;k++)
				{
					arr[k]=arr[k+1];
				}
				n--;
			}
			else
				j=j+1;
		}
	}
	display(arr,n);

	/*n is returned so that the size of the array is also updated in
the main program*/
	return n;
}

/*Function to display array*/
int display(int *arr,int n)
{
	int i;
	for(i=0;i<n;i++)
	{
		printf("\n\t%d",arr[i]);
	}
	printf("\n");
	return 0;
}
```

OUTPUT:

```
Enter size of array:7

Enter the elements:1 1 2 1 3 2 9

Array before removing duplicate elements:
1
1
2
1
3
2
9

Array after removing duplicate elements:
1
2
3
9
```

DISCUSSION:

The complexity of the Program is $O(n^3)$. The function is designed in such a way so that it can also be used as a standalone function in any other program as well.