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EXPERIMENT 09

Program:

```
#include<stdio.h>
#include<stdlib.h>
void insertionSort(int arr[], int n);
void main()
{ int arr[100], i, n, x, choice, flag = 0;
  printf("\nEnter the number of elements of the array [maximum size = 100]: ");
  scanf("%d",&n);
  printf("\nEnter %d elements of the array: \n", n);
  for (i=0;i<n;i++)
   { scanf("%d",&arr[i]);
   }
   insertionSort(arr,n);
   do
    { printf("\n1.Display Sorted List\t 2.Search a particular value\t 3.Exit");
      printf("\nPlease Enter your choice: ");
      scanf("%d",&choice);
      switch (choice)
        { case 1:
          { printf("\n\nThe sorted array is: \n");
            for (i=0;i<n;i++)
             { printf("%d\t",arr[i]);
             }
            break;
          }
         case 2:
          { printf("\nEnter the number to be searched: ");
            scanf("%d",&x);
            int beg=0, end=n-1,mid;
            while (beg<=end)
             { mid=(beg+end)/2;
               if (arr[mid]==x)
                { printf("\n%d is present in the sorted array at index: %d",x,mid);
                  flag=1;
                  break;
                }
               else if (arr[mid]>x)
                { end=mid-1;
                }
               else
                { beg=mid+1;
                }
             }
            if (beg>end||flag==0)
             { printf("\n%ddoes not exist int the array",x);
             }
            break;
```

```
        }
        case 3:
         { printf("\n Program Finished !! Thank You");
           break;
         }
        default:
         { printf("\nPlease enter a valid choice 1, 2, 3.");
         }
       }
   } while (choice!=3);
}
void insertionSort(int arr[],int n)
{ int i, j, temp;
  for (i=1;i<n;i++)
    { temp=arr[i];
      j=i-1;
      while ((temp<arr[j])&&(j>=0))
       { arr[j+1]=arr[j];
         j--;
       }
      arr[j+1]=temp;
    }
}
```

Output: