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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%d does not exist in 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:

```

Activities Terminal Oct 9 14:38
dl0418@ltadmin: ~
dl0418@ltadmin:~$ ./a.out
Enter the number of elements of the array [maximun size = 100]: 5
Enter 5 elements of the array:
9
4
6
3
2
1.Display Sorted List 2.Search a particular value 3.Exit
Please Enter your choice: 1
The sorted array is:
2 3 4 6 9
1.Display Sorted List 2.Search a particular value 3.Exit
Please Enter your choice: 2
Enter the number to be searched: 9
9 is present in the sorted array at index: 4
1.Display Sorted List 2.Search a particular value 3.Exit
Please Enter your choice: 2
Enter the number to be searched: 5
5does not exist int the array
1.Display Sorted List 2.Search a particular value 3.Exit
Please Enter your choice: 3
dl0418@ltadmin:~$

```