**Lab_1**

**BINARY SEARCH:**

```
#include<bits/stdc++.h>
using namespace std;
int main()
{
   int low,high,mid;
   int flag=0;
   int ara[20]= {10,12,18,25,29,31,32,39,41,45,49,51,55,56,58,62,68,69,72};
   int key=32;
   low=0;
   high=19;
   cout<<"The Key Value Is "<<key<<endl;
   while(low<=high)
   {
      mid=(low+high)/2;
      if(key==ara[mid])
      {
         cout<<"number found in index "<<mid+1<<endl;
         flag=1;
         break;
      }
      else if(key<ara[mid])
      {
         high=mid-1;
      }
      else
      {
         low=mid+1;
```

```
        }
    }
 if(flag==0)
    {
        cout<<"Number not found"<<endl;
    }
    return 0;
}
```

**CASE_1**

**Sample Input:** 10,12,18,25,29,31,32,39,41,45,49,51,55,56,58,62,68,69,72

**Output:**

The Key Value Is 32

number found in index 7

**CASE_2**

**Sample Input:** 10,12,18,25,29,31,32,39,41,45,49,51,55,56,58,62,68,69,72

**Output:**

The Key Value Is 37

Number not found.

**INSERTION_SORT::**

```
#include<bits/stdc++.h>
#include <time.h>
using namespace std;
int main()
{
    int arrayList[30],i,temp,j;
```

```
   srand(time(NULL));            ///generate random number each test case
   printf("Before Insertion: \n");
   for(i=0; i<30; i++)
   {
      ///input of random number
      arrayList[i]=(rand() % 100);
      printf("%d  ",arrayList[i]);
   }

   for(i=1; i<=30-1; i++)
   {
      temp=arrayList[i];
      j=i-1;
      while((temp<arrayList[j])&&(j>=0))
      {
         arrayList[j+1]=arrayList[j];    //moves element forward
         j=j-1;
      }

      arrayList[j+1]=temp;    //insert element in proper place
   }
   printf("\nAfter Insertion_Sort the sorted List is: \n");
   for(i=0; i<30; i++)
      printf("%d\t",arrayList[i]);
   return 0;
}
```

**Sample Input:**

**Before Insertion:**

3 27 86 27 7 88 70 31 30 14 76 14 67 11 10 1 85 32 65 45 74 70 0 11 99 75 43 32 51 83

**After Insertion_Sort the sorted List is:**

0 1 3 7 10 11 11 14 14 27 27 30 31 32 32

43 45 51 65 67 70 70 74 75 76 83 85 86 88 99