



Data Structures

Experiment no. 10

Develop code to perform Binary Search & Fibonacci Search

Q. WAP in C to implement Binary Search.

Code:

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int arr[100],i, b,e,mid,n,t;
    clrscr();
    printf("Enter Number of elements in array: ");
    scanf("%d",&n);

    printf("\nEnter %d Elements in Array: ",n);
    for(i=0;i<n;i++)
    {
        scanf("%d",&arr[i]);
    }

    printf("\nEnter Element to be search: ");
    scanf("%d",&t);
    b=0;
    e=n-1;
    while(b<=e)
    {
        mid=(b+e)/2;
        if(t<arr[mid])
            e=mid-1;
        else if(t>arr[mid])
            b=mid+1;
        else
            b=e+1;
    }
    if(t==arr[mid])
        printf("\nElement %d found at %d Location",t,mid);
    else
        printf("\n Element Not Found...");
    getch();
}
```

```
}
```

Output:

```
Enter Number of elements in array: 10
```

```
Enter 10 Elements in Array:
```

```
10
```

```
20
```

```
30
```

```
40
```

```
50
```

```
60
```

```
70
```

```
80
```

```
90
```

```
100
```

```
Enter Element to be search: 70
```

```
Element 70 found at 6 Location
```

Q. WAP in C to implement Fibonacci Search.

Code:

```
#include<stdio.h>
#include<conio.h>

int arr[100];
int fib[10]={0,1,1,2,3,5,8,13,21,34};
int fiboSearch(int *a,int n,int *f,int s);
int findMin(int a,int b);

void main()
{
    int i,n,s,location=-1;
    clrscr();
    printf("\nEnter Number of Elements in array:");
    scanf("%d",&n);
    printf("\nEnter %d Elements in Array:",n);
    for(i=0;i<n;i++)
        scanf("%d",&arr[i]);
    printf("\nEnter Element to be search in array:");
    scanf("%d",&s);
    location=fiboSearch(arr,n,fib,s);
    if(location !=0)
        printf("\nElement %d Found at location %d",s,location);
    else
        printf("\nElement Not Found");

    getch();
}

int fiboSearch(int *a,int n,int *f,int s)
{
    int k=0,offset=-1,i;
    while(f[k]<=n)
        k++;

    while(f[k]!=0)
    {
        i=findMin(offset+f[k-2],n-1);
        if(s==a[i])
            return i;
        else if(s>a[i])
        {
            k=k-1;
            offset=i;
        }
        else
    }
```

```

        {
            k=k-2;
        }
    }
    return 0;
}

int findMin(int a,int b)
{
    int min;
    if(a<b)
    {
        min=a;
    }
    else
    {
        min=b;
    }
    return min;
}

```

Output:

```

Enter Number of Elements in array:10

Enter 10 Elements in Array:5
25
125
625
650
700
800
900
1000
1500

Enter Element to be search in array:800

Element 800 Found at location 6

```