EXPERIMENT NO: 6

TITLE: Introduce 1D Array manipulation and implement Binary search.

PROGRAM:

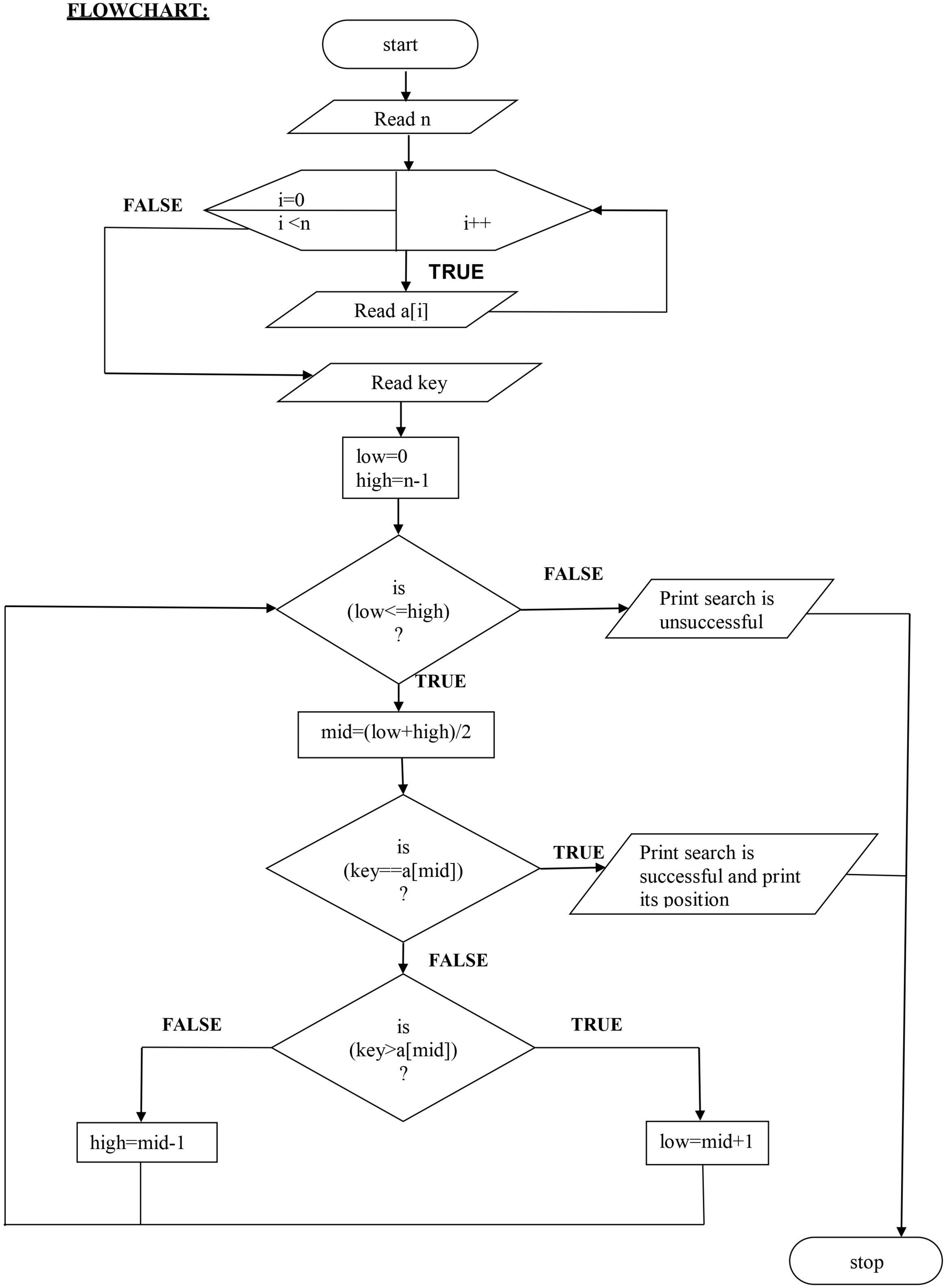
```
#include<stdio.h>
#include<stdlib.h>
void main()
{
        int low, high, n, mid, i, a[100], key ;
  printf("Enter the number of elements\n");
scanf("%d",&n);
printf("Enter the elements in ascending order\n");
for(i=0;i<n;i++)
{
        scanf("%d",&a[i]);
}
printf("Enter the element to be searched\n");
scanf("%d",&key);
low=0;
 high=n-1;
while(low<=high)
{
        mid=(low+high)/2;
        if(key == a[mid])
        {
                printf("Successful Search and element is found at position =
%d\n",mid+1);
                exit(0);
        }
        if(key>a[mid])
        {
                low=mid+1;
        }
         else
        {
                high=mid-1;
         }
    }
    printf("Unsuccessful Search\n");
 }
```

OUTPUTS:

1) Enter the number of elements
   6
   Enter the elements in ascending order
   -12
   -6
   26
   58
   71
   92
   Enter the element to be searched
   71
   Successful Search and element is found at position = 5

```
2)  Enter the number of elements
     6
    Enter the elements in ascending order
    -12
    -6
    26
    58
    71
    92
    Enter the element to be searched
    72
   Unsuccessful Search
```

FLOWCHART:


start
Read n
i=0
i <n
i++
FALSE
TRUE
Read a[i]
Read key
low=0
high=n-1
is
(low<=high)
?
FALSE
Print search is
unsuccessful
TRUE
mid=(low+high)/2
is
(key==a[mid])
?
TRUE
Print search is
successful and print
its position
FALSE
is
(key>a[mid])
?
FALSE
TRUE
high=mid-1
low=mid+1
stop

ALGORITHM:

Step 1: start

Step 2: Read value for **n**

Step 3: Initialize i=0

Step 4: check (i < n)

if yes read value for a[i]

i=i+1, **goto step (4)**

Step 5: Read **key**

Step 6: Assign low=0, high=n-1

Step 7: while low<=high do the following

mid=(low+high)/2

if key is equal to a[mid]

display "successful search and prints its position"

goto step(9)

endif

if key is greater than a[mid]

low = mid + 1

else

high = mid -1

endif

endwhile

Step 8: Display "search is unsuccessful"

Step 9: stop