Date __/__/____

Saathi

Name - Savant Onkar Vitthal
Seat no - 240630
Roll no - 45
Enrollment no - 1910020362

* Title :
Develop a program to perform Binary Search on Array

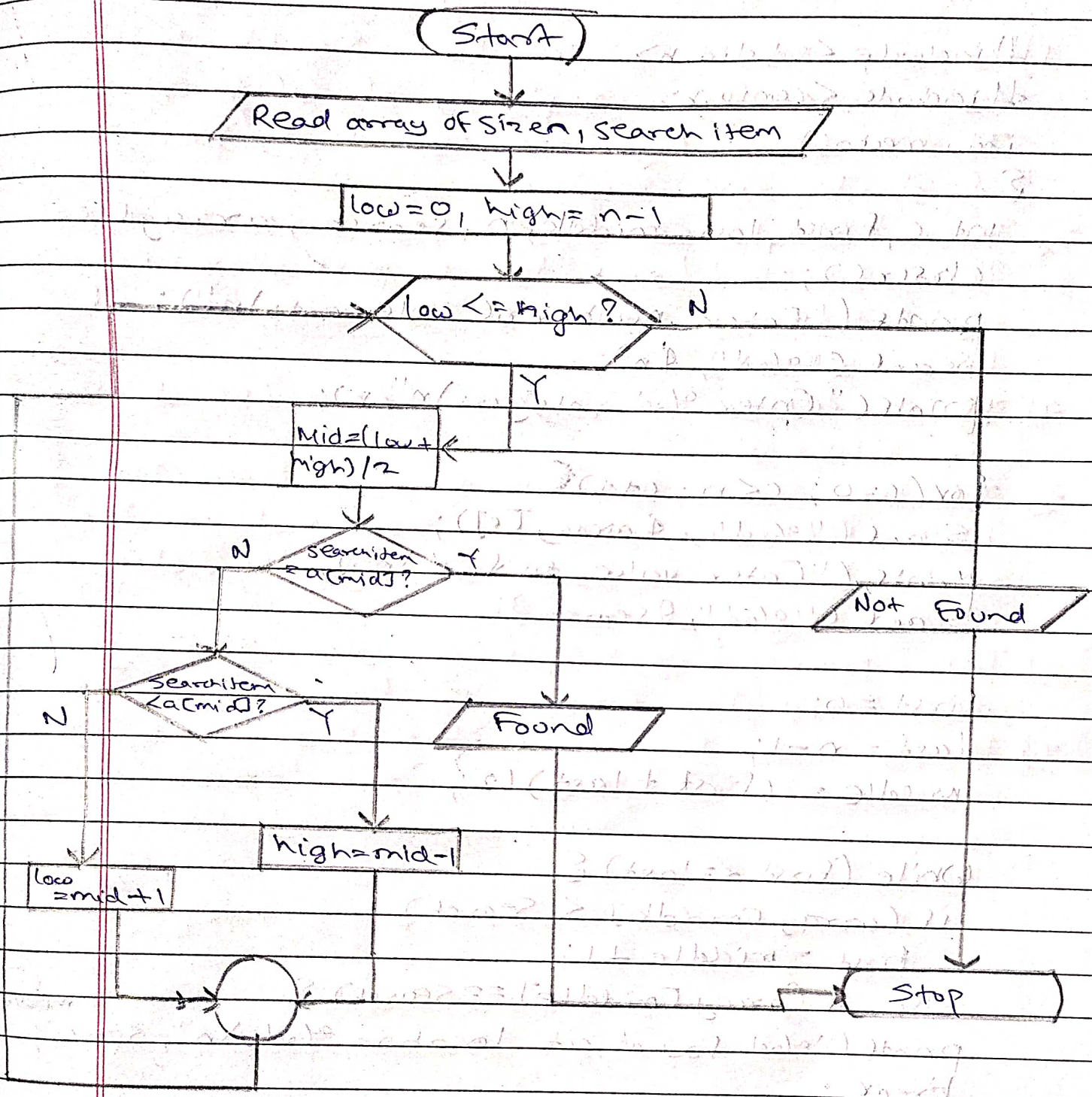
* Algorithm :

1] Start
2] [Initialize] Set Beg = Lower bound
end = upper bound, Pos = -1
3] Repeat steps 3 and 4 while Beg <= End
4] Set Mid = (Beg + End) / 2
5] IF A[MID] = VAL
Set POS = MID
Print POS
Go to Step 6
Else IF A[MID] > VAL
Set End = MID - 1
else
set Beg = Mid + 1
[End of IF]
[End of loop]
6] IF POS = -1
Print "Value is not present in Array"
[End of IF]
7] Stop

Date ___/___/_____

Saathi

* Flowchart :



Date __/__/____

Saathi

Program

Code:

```
#include <stdio.h>
#include <conio.h>
int main()
{
  int c, first, last, middle, n, search, array[100];
  clrscr();
  printf("Enter number of elements\n");
  scanf("%d", &n);
  printf("Enter %d integers\n", n);

  for(c=0; c<n; c++)
  scanf("%d", &array[c]);
  printf("Enter value to find\n");
  scanf("%d", &search);

  first = 0;
  last = n-1;
  middle = (first+last)/2;

  while (first <= last) {
   if (array[middle] < search)
     first = middle + 1;
   else if (array[middle] == search) {
   printf("%d found at location %d.\n", search, middle+1);
   break;
  }
  else
     last = middle - 1;
```

Saathi

Date ___/___/_____

```
        middle = (first + last)/2;
    }
    if (first > last)
    printf("Not found! %d isn't present in list.\n", search);
        return 0;
}
```

* Output:

```
Enter number of elements:
7
Enter 7 integer
-4
5
8
9
11
43
485
Enter value to find
11
11 found at location 5
```

Saathi

Date __/__/____

* Explanation:

1) Binary Search is a fast search algorithm with run-time Complexity of O(log n). This Search Algorithm works on principal of divide and conquer.
2) Data should be sorted in order to work.
3) The search looks for a particular item by Comparing the middle most item of the collection.
4) If a match occurs, then the index of item is returned.
5) If the middle item is greater than the item, then the item is searched in the sub-array to the left of middle, otherwise to the right of middle.
6) This process continues on the array until the element is found.
7) Binary Search halves the searchable items and thus reduced the count of Comparison to be made very less.