Problem solving through Programming In C - Course

Week-09 Program-03

Write a C program to search a given number from a sorted 1D array and display the position at which it is found using binary search algorithm. The index location starts from 1.

Sample Test Cases

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>2 found at location 2.</td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>100 found at location 7.</td>
</tr>
<tr>
<td>40</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
</tr>
<tr>
<td>90</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Sample solutions (Provided by instructor)

```c
#include <stdio.h>
int main()
{
    int c, n, search,
    array[100];
    scanf("%d", &n); //number of elements in the array
    for (c = 0; c < n; c++)
        scanf("%d", &array[c]);
    scanf("%d", &search); //The element to search is read from test case.
    /* Use the printf statements as below:
    printf("%d found at location %d.
", search, variable name);
    printf("Not found! %d isn't present in the list.
", search);
    */
    int first, last, middle;
    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.
", search, middle+1);
            break;
        } else
            last = middle - 1;
        middle = (first + last)/2;
    if (first > last)
        printf("Not found! %d isn't present in the list.
", search);
    return 0;
}
```

Test Case 3

40 found at location 4.

Test Case 4

Not found! 10 isn't present in the list.