S.No: 19	Exp. Name: ***Write a C program to Search a Key string using Binary search Technique***	Date:2024-06-02

ID: 92132321021

Aim:

Write a program to **search** a key string in the given array of strings using `binary search`.

At the time of execution, the program should print the message on the console as:

```
Enter value of n :
```

For example, if the user gives the **input** as:

```
Enter value of n : 4
```

Next, the program should print the messages one by one on the console as:

```
Enter string for a[0] :
Enter string for a[1] :
Enter string for a[2] :
Enter string for a[3] :
```

if the user gives the **input** as:

```
Enter string for a[0] : Apple
Enter string for a[1] : Orange
Enter string for a[2] : Kiwi
Enter string for a[3] : Mango
```

Next, the program should print the message on the console as:

```
Enter key string :
```

if the user gives the **input** as:

```
Enter key string : Kiwi
```

then the program should **print** the result as:

```
After sorting the strings in the array are
Value of a[0] = Apple
Value of a[1] = Kiwi
Value of a[2] = Mango
Value of a[3] = Orange
The key string Mango is found at the position 2
```

Similarly if the key element is given as **Litchi** for the above case then the program should print the output as "**The key string Litchi is not found in the array**".

Source Code:

BinarySearchDemo3.c

```
/*
#include<stdio.h>
#include<string.h>
void main() {
```

```
   char a[20][20];
   int i, j, n, flag = 0, low, high, mid;
   char temp[20], key [20];
   printf("Enter value of n : ");
   scanf("%d", &n);

   //Write the code to read n string into the array.

   printf("Enter key string : ");
   scanf("%s", key);

   //Write the logic to sort the array.

   //The code below prints the array after sorting.
   printf("After sorting the strings in the array are\n");
   for (i = 0; i < n; i++) {
      printf("Value of a[%d] = %s\n", i, a[i]);
   }

   //Write the code to perform the binary search.

   //Fill the condition below.

   if (    ) {
      printf("The key string %s is found at the position %d\n", key, mid);
   } else {
      printf("The key string %s is not found in the array\n", key);
   }
}
*/


#include<stdio.h>
#include<string.h>

void main() {
    char a[20][20];
    int i, j, n, flag = 0, low, high, mid;
    char temp[20], key[20];

    // Reading the number of strings
    printf("Enter value of n : ");
    scanf("%d", &n);

    // Reading n strings into the array
    for (i = 0; i < n; i++) {
        printf("Enter string for a[%d] : ", i);
        scanf("%s", a[i]);
    }

    // Reading the key string
    printf("Enter key string : ");
    scanf("%s", key);

    // Sorting the array using bubble sort
    for (i = 0; i < n - 1; i++) {
```


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```
        for (j = i + 1; j < n; j++) {
            if (strcmp(a[i], a[j]) > 0) {
                strcpy(temp, a[i]);
                strcpy(a[i], a[j]);
                strcpy(a[j], temp);
            }
        }
    }

    // Printing the sorted array
    printf("After sorting the strings in the array are\n");
    for (i = 0; i < n; i++) {
        printf("Value of a[%d] = %s\n", i, a[i]);
    }

    // Performing binary search
    low = 0;
    high = n - 1;
    flag = 0;

    while (low <= high) {
        mid = (low + high) / 2;
        if (strcmp(a[mid], key) == 0) {
            flag = 1;
            break;
        } else if (strcmp(a[mid], key) < 0) {
            low = mid + 1;
        } else {
            high = mid - 1;
        }
    }

    // Printing the result of the binary search
    if (flag) {
        printf("The key string %s is found at the position %d\n", key, mid);
    } else {
        printf("The key string %s is not found in the array\n", key);
    }
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
Enter value of n : 4
Enter string for a[0] : Apple
Enter string for a[1] : Banana
Enter string for a[2] : Orange
Enter string for a[3] : Mango
Enter key string : Mango
After sorting the strings in the array are
Value of a[0] = Apple
Value of a[1] = Banana

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```
Value of a[2] = Mango
Value of a[3] = Orange
The key string Mango is found at the position 2
```