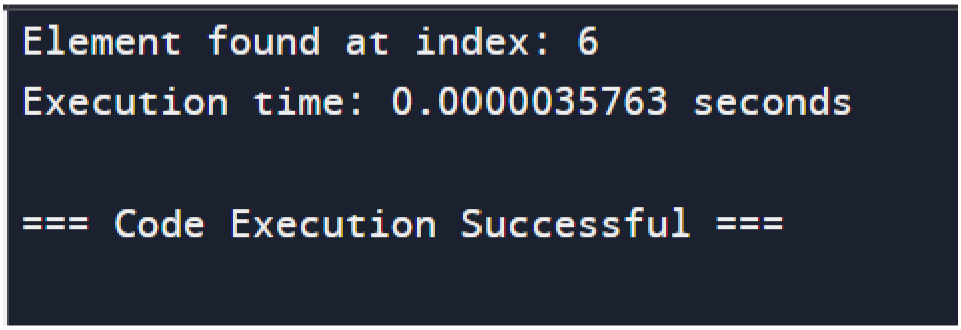
82. Binary search

PROGRAM:-

```
import time

def binary_search(arr, x):
    left, right = 0, len(arr) - 1
    while left <= right:
        mid = left + (right - left) // 2
        if arr[mid] == x:
            return mid
        elif arr[mid] < x:
            left = mid + 1
        else:
            right = mid - 1
    return -1

def find_binary_search_time(arr, x):
    start_time = time.time()  # Start time measurement

    index = binary_search(arr, x)  # Perform binary search

    end_time = time.time()  # End time measurement
    elapsed_time = end_time - start_time

    return index, elapsed_time

# Example usage
example_list = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
search_element = 7
index, execution_time = find_binary_search_time(example_list, search_element)

if index != -1:
    print(f"Element found at index: {index}")
else:
    print("Element not found")
print(f"Execution time: {execution_time:.10f} seconds")
```

OUTPUT:-



```
Element found at index: 6
Execution time: 0.0000035763 seconds


=== Code Execution Successful ===
```

TIME COMPLEXITY:-O(log n)