



Taibah University
College of Computer Science and Engineering (Yanbu) Fall(2022)

Algorithms & Data Structures

Lab 02

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1. Laboratory Objectives:

- The purpose of this lab session is to acquire skills in working with experimental and theoretical analysis.

2. Exercises

In the following, the linear search algorithm is provided. Follow to the next page and read all required tasks.

Function search(A, n, k)

Input:A, n, k

Output:index of k, or -1

```
    for i←0;i<n;i←i+1 do
        if A[i]=k then
            return i
        end if
    end for
    return -1
```

End search

1. Write the provided program using Java language to search for a k value in an array of n elements. The elements of the array should be ordered in a random way.
2. Get the actual running time using `System.currentTimeMillis()`;
3. Increase n, how does the running time grow with n?
4. Plot the results
5. Now, count the primitive operations to get the estimated running time.