**Lab Exercises 7: Searching**

**LEARNING OUTCOMES**

These lab exercises is to

* Understand Searching Theory
* Able to implement Searching in coding

### PROBLEM: SEARCHING

**LAB EXERCISE 7.1** [2]

Estimate Time**: 40 *Minutes***

**Tasks:**

Consider the following list in an array:

63 45 32 98 46 57 28 100

1. Using the linear sequential search, how many comparisons are required to find whether the items in Figure 7.1 are in the list?
2. **90 – 8 comparison**
3. **57**
4. **63**
5. **120**
6. Using the ordered sequential search, how many comparisons are required to find whether the items in Figure 1 are in the list?

28 32 45 46 57 63 98 100

1. Using the binary search, how many comparisons are required to find whether the items in Figure 7.1 are in the list?

28 32 45 46 57 63 98 100

1. 90
2. 57
3. 63
4. 120

Figure 7.1: Item in an array

**LAB EXERCISE 7.2**

Estimate Time**: 40 *Minutes***

**Tasks:**

Implement the linear sequential search by using the linked list. You output should look like Figure 7.2.

Enter choice: l

22

56

2

45

23

e - Enter a number

l - List all numbers

d - Search a number

x - Exit

Enter choice: d

Enter key value for linear sequential search: 45

Key match found!

e - Enter a number

l - List all numbers

d - Search a number

x - Exit

Enter choice: d

Enter key value for linear sequential search: 99

Sorry, no match found

Figure 7.2: Output for Linear Sequential Search Using Linked List

**LAB EXERCISE 7.3**

Estimate Time**: 40 *Minutes***

**Tasks:**

Modify the program for searching using binary search by adding the following criteria:

1. Print the number of comparisons for searching using binary search
2. Print the location if the item is found in the list

Output of your program is as Figure 7.3

Enter list size: 5

Enter number: 24

Enter number: 67

Enter number: 43

Enter number: 12

Enter number: 98

Enter key value for binary search: 12

Sorted list of element entered: 12 24 43 67 98

Value for mid: 2

Value for mid: 0

Key match found in data[0]

Number of comparison is 2

Figure 7.3: Output for Binary Search