# Experiment 6. Data Structs

## I. Experiment purpose

For this lab, you will practice the quick sort, merge sort, sequential search and quick sort. Submit with all the step-by-step solutions.

## II. Use instruments and materials

ProcessOn

## III. Experiment content

Given the following list of string objects,

{“Jujube”, “Orange”, “Logan”, “Pomegranate”, “Raspberry”, “Cantaloupe”, “Carambola”, “Date palm”, “Coconut”}

• Sort the list by the quick sort algorithm. You may choose any element as the pivot.

• Sort the list again by the merge sort algorithm.

• In the sorted list, search “Logan” using the binary search algorithm.

• In the sorted list, search ”Apple” using the sequential search algorithm.

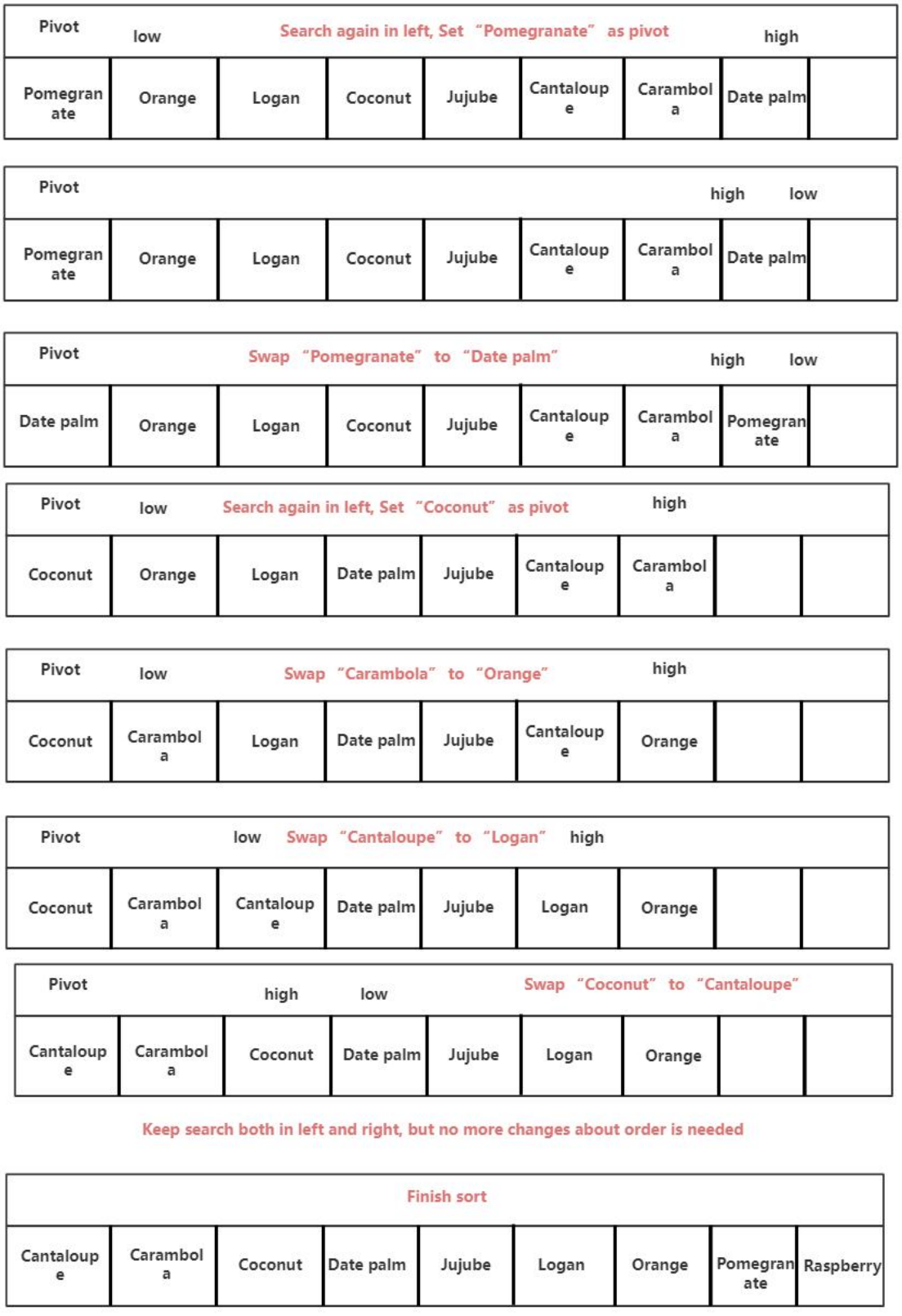
## IV. Test steps and process records

Step1:The process of quick sort. (In next page)

| Pivot | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Jujube | Orange | Logan | Pomegranate | Raspberry | Cantaloupe | Carambola | Date palm | Coconut |

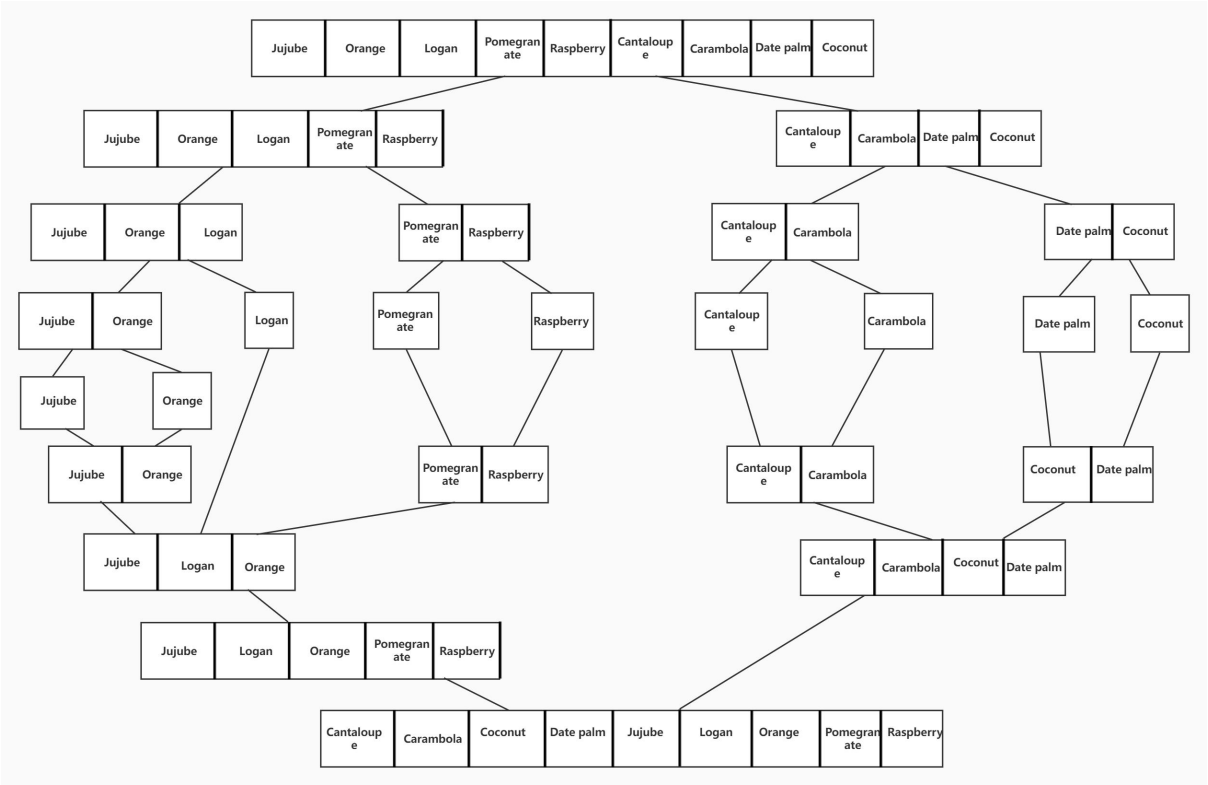
| Pivot | Set “Raspberry” as pivot | | | high < low, search stops | | | high | low |
|---|---|---|---|---|---|---|---|---|
| Raspberry | Orange | Logan | Pomegranate | Jujube | Cantaloupe | Carambola | Date palm | Coconut |

| Pivot | Swap “Raspberry” to “Coconut” | | | | | | high | low |
|---|---|---|---|---|---|---|---|---|
| Coconut | Orange | Logan | Pomegranate | Jujube | Cantaloupe | Carambola | Date palm | Raspberry |




Graph 1 QuickSort Process

Step2:The process of merge sort.

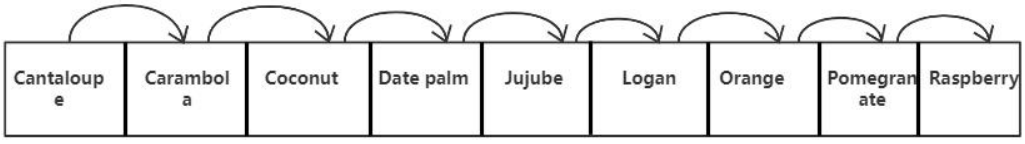



Graph 2 MergeSort Process

Step3: The process of binary search for “Logan”


Graph 3 BinarySearch Process

Step4: The process of sequential search for “Apple”




Graph 4 SequentialSearch Process

# Ⅴ. Experimental gains and experiences

1. Learn about the qucik sort, merge sort, quick search and sequential search.

2. Learn about the logic and internal implementation process of various sort and search algorithms.

3. Learn about the pros and cons about each algorithm.