

Data structure & Algorithms

Workshop 7

I. Exercise

1. When performing sequential searches on both ordered and unordered sequential lists of the same size, analyze whether their average search lengths (ASL) under equal probability conditions are identical in the following three scenarios:
 - 1.1 Unsuccessful search (no record with the given value exists);
 - 1.2 Successful search (only one record with the given value K exists);
 - 1.3 The search is successful, and the table contains multiple records with a given keyword equal to K. The search is required to find all records. In this case, the average search length should account for the number of comparisons needed to locate all records.
2. Draw the binary search processes for keywords e, f and g in the linear table (a, b, c, d, e, f, g).
3. Draw the decision tree for binary search on an ordered list of length 10, and calculate the average search length of the search successful with equal probability.
4. Assume the sequential table is searched using the following recursive method: if the table length is ≤ 10 , perform a sequential search; otherwise, perform a binary search. Draw the decision tree for the sequential table with $n=50$ when performing the above search, and calculate the average search length under equal probability conditions.

II. Experiment

5 The table with a length of 12 is known as follows

(Jan, Feb, Mar, Apr, May, June, July, Aug, Sep, Oct, Nov, Dec)

- 5.1 Insert an initial empty binary search tree into the table in the specified order, then draw the resulting tree and calculate the average successful search length under equal probability conditions.
- 5.2 If the elements in the table are first sorted to form an ordered list, calculate the average search length for a successful binary search in this ordered list under the condition of equal probability