# Tries

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# Intro to Tries

- An efficient data structure for dictionary (which uses strings as keys)
  - English dictionary (from a given word to its definition)
  - Yellow page (from a given name to his/her phone number)
- Why you need to learn  tries
  - An alternative solution to <map> and <unordered_map>
  - For job interviews
  - For homework of IR

# Animation of Tries

Quiz!

- Construction
  - key = the, a, there, answer, any, by, bye, their
- Search
  - any
  - these

# Code Examples

- Examples
  - trie00.cpp ➔ C-flavored
  - trie01.cpp ➔ C++

# Complexity

- Assuming we have n keys, each with m characters
- Tries
  - Time complexity
    - Construction: O(m*n)
    - Search: O(m)
  - Space complexity: O(m*n)
- Binary search
  - Time complexity
    - Construction: O(m*n*log(n))
    - Search: O(m*log(n))
  - Space complexity: O(m*n)

Quiz!

# References

- References to tries
  - Video
    - HackerRank
    - Trie data structure (with detailed example)
    - CS50: Kevin Schmid , Details
  - Trie: Insert and search (with code)
  - Programming tutorials by SourceTrick (with code)
  - CS50: slides