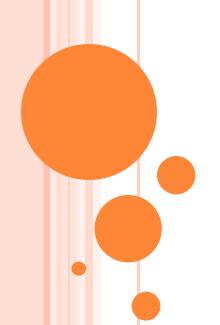




Jyh-Shing Roger Jang (張智星) CSIE Dept, National Taiwan University





#### 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 our homework

## ANIMATION OF TRIES

Quiz!

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



# Code Examples

## o Examples

- trie00.cpp → C-flavored
- trie01.cpp → C++



# Complexity

- Assuming we have n keys, each with m characters
- Tries
  - Time complexity
    - o Construction: O(m\*n)
    - o Search/insert: O(m)
  - Space complexity: O(ALPHABET\_SIZE\*m\*n)=O(m\*n)
- Binary search
  - Time complexity
    - o Construction: O(m\*n\*log(n))
    - Search: O(m\*log(n))
  - Space complexity: O(m\*n)

Quiz!

26 for English



### References

#### References to tries

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

Course from Harvard Univ.