

SoHo Restaurants

By Kerry Driscoll



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The Situation

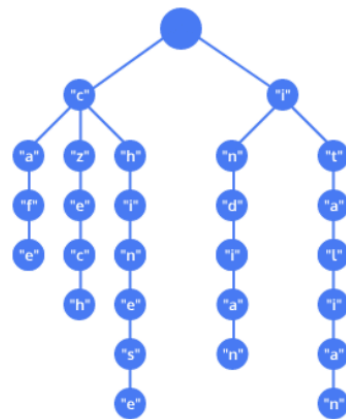
- Codecademy employees are hungry and are looking for a spot for lunch!
- There are many restaurants to choose from in the surrounding SoHo neighborhood
- Create a program that allows employees to
 - A) Search for the type of cuisines they want to eat
 - B) Returns relevant information about the restaurants like address, price and rating to help the employee make a decision



Part 1: Autocomplete Search

- Data Structures

- Used a Trie Data Structure
- I selected the trie data structure because it seemed like an interesting coding challenge to build a tree with multiple nodes (not just binary)



- Runtime

- The runtime (in asymptotic notation) of searching for a food type is $O(N)$.
- I think the trie is the most efficient data structure because each letter is recorded one and not repeated. For instance, with “chinese” and “cafe” we are saving space and time, by only recording the first letter “c” once at a shared node.



Part 2: Retrieve Restaurant Data

● Data Structures

- Implemented with a Hash Map of Linked Lists of Hash Maps
- I selected this combination of hash maps and linked lists because it was the most intuitive to me. It made sense to assign the restaurant info to consistent keys (price, rating, etc) and to assign the restaurants to their respective cuisine type.



● Runtime

- The runtime (in asymptotic notation) of retrieving restaurants from a hash map is $O(1)$
- This is the most efficient runtime. There are no orders of simplicity below N^0



Other Applications

- Data Structures can be handy tools in many situations:
 - Signing up for classes in a university setting
 - Hash tables to determine if the student has the necessary prerequisites/major
 - Queues to decide the order in which students can sign up for the class by seniority: seniors first, freshman last
 - Building a database linking collaborators like IMDb
 - Graphs show the relationship between actors who have co-starred in the same film(s)
 - Hash tables of the different roles an individual assumed on a project (actor, director, writer, etc)
 - Linked lists of the order of billing actors had on a project

