Implementing and Understanding Data Structures in Java

GETTING STARTED

Dan Bunker

http://www.linkedin.com/in/bunkerdan

Data Structure Line Up

Stack

Queue

Linked List

Hash Table

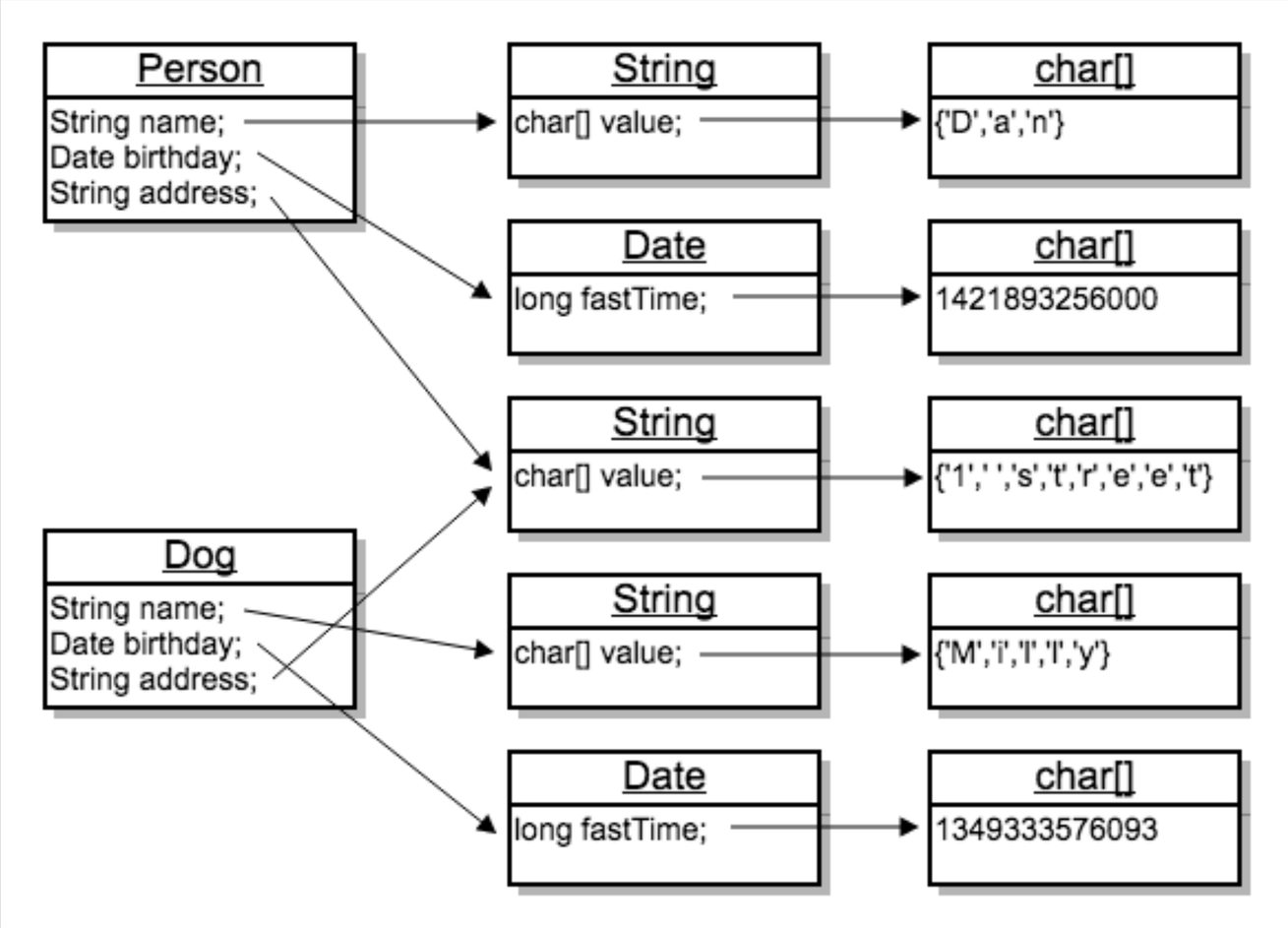
Binary Tree

Data Structure

A method of organizing information so that the information can be stored and retrieved efficiently


Changing oil at broadband speed.
Manchester Blvd
La Cienega Blvd
Century Blvd
LA airport

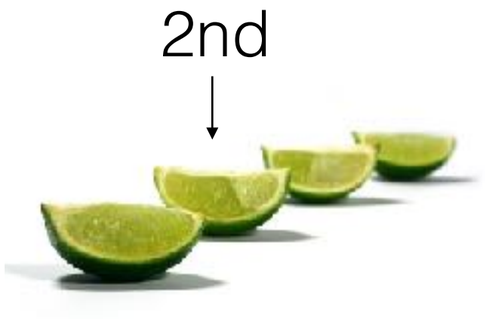
```
String s = "a string";
char value[] = {'a', ' ', 's', 't', 'r', 'i', 'n', 'g'};
```



Data Structure Characteristics

8

FIFO LIFO

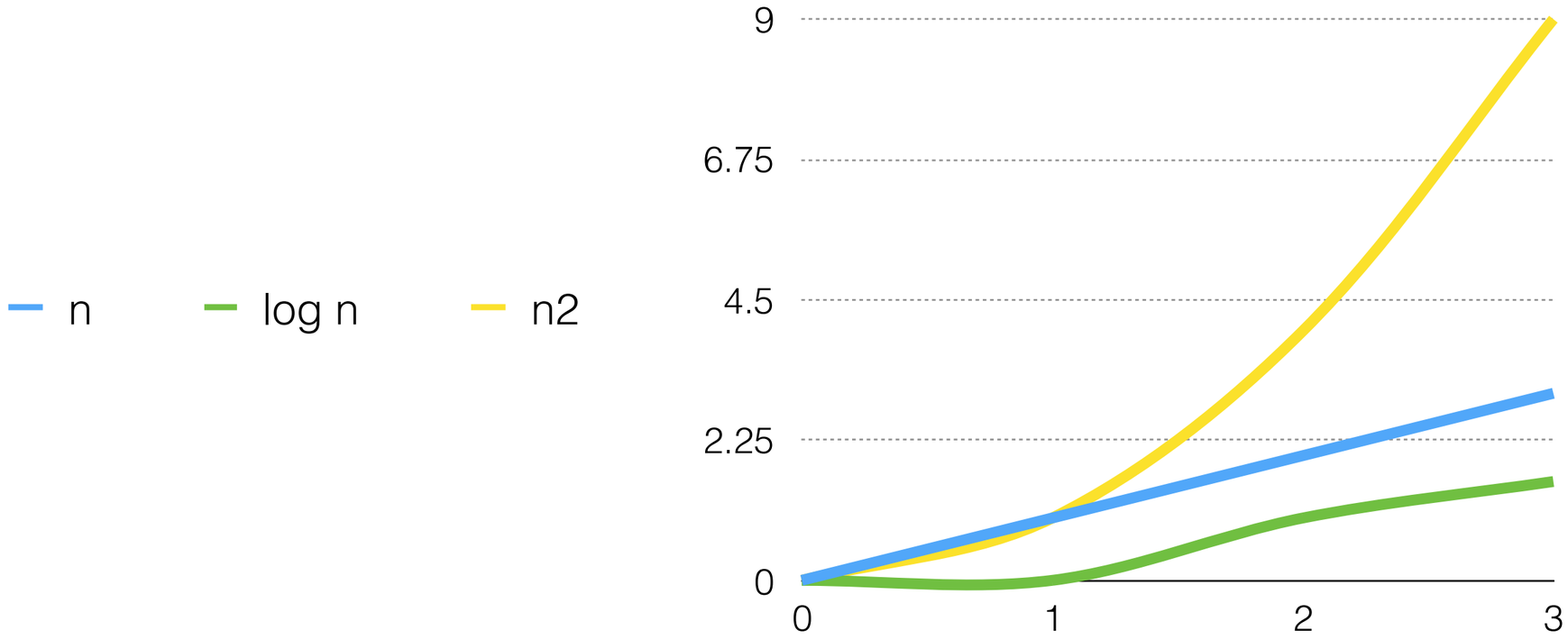


Big O Notation

O(*n*) or **O(*log n*)**

O stands for order of the function or growth rate

The actual mathematical function



Common Big O Algorithms

Name	Big O Notation	Example
Constant	O(*1*)	return true;
Logarithmic	O(log *n*)	binary search
Linear	O(*n*)	for or while loop
Quadratic	O(*n^2*)	loop within a loop
Exponential	O(c^*n*)	recursive calls over n and looping over c in the function
Factorial	O(*n!*)	looping over n and recursive call in the loop to n-1

Data Structure Performance

	Access	Search	Insert	Delete
Stack	O(*n*)	O(*n*)	O(*1*)	O(*1*)
Queue	O(*n*)	O(*n*)	O(*1*)	O(*1*)
Linked List	O(*n*)	O(*n*)	O(*1*)	O(*1*)
Hash Table	O(*1*)	O(*1*)	O(*1*)	O(*1*)
Binary Tree	O(*log n*)	O(*log n*)	O(*log n*)	O(*log n*)

Summary

What is a data structure?

Data structure characteristics

Big O notation

Performance