efficient

Simple

(Heuristic : accuracy)

efficient

readable

testable

Hard

Problem

input info

output info

Algorithm

input data

↓

steps to follow

output data

arguments →

function

Parameters

↓

code

return value

←

Algorithms control how you see the world

Search

input: - short text describe
- all web pages

- find a list of pages that match
- pick "best" - quality/strength of match
- popular - many links

output: what I'm looking for
(guess) - 10-20

Recommendation

input: - viewing history
- all posts/videos/etc
- other's viewing history

- similar to other viewers
- not just what you view

output: a few good recommendations

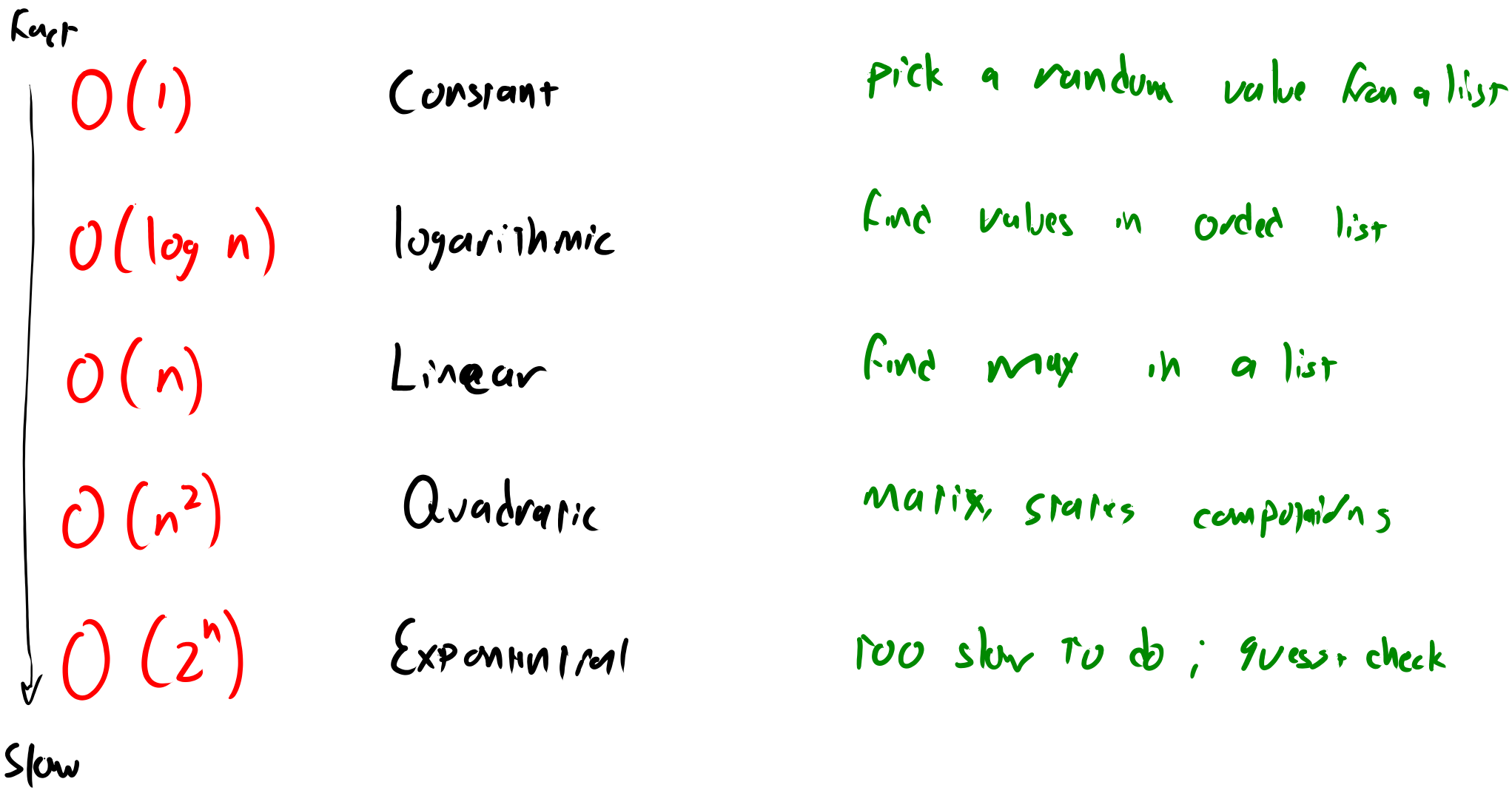
These algorithms are A: Good B: Neutral C: Bad

Scale w/ Big inputs

n - size of input (in bytes)

$$runtime(n) = O(n^2)$$

big-O — roughly


Fast
O(1)
Constant
pick a random value from a list
O(log n)
logarithmic
find values in ordered list
O(n)
Linear
find max in a list
O(n²)
Quadratic
matrix, pairs comparisons
O(2ⁿ)
Exponential
too slow to do; guess+check
Slow