Memoization

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Spring 2019

Today’s music: *Fugue in G Minor, BWV 578* by JS Bach
Review

Currently in 3110: Advanced data structures
• Streams
• Balanced trees
• Mutability
• Promises
• Monads

Today:
• Memoization
ARRAYS AND HASHTABLES
MEMOIZED FIBONACCI
Stepping back...

- We took a function,
- We added (mutable) storage,
- We wrapped the function so it either:
  - Returns a previously computed result or
  - Computes the result and stores it
OPTIMIZING FUN
Want to maximize “fun” but can’t invite a person and their boss.

This is also known as the maximum wet independent set.
MEMOIZED PARTY PLANNING
Given:
• “This may be a difficult example”
• Margin = 13

Greedy
This may be a difficult example

Optimal
This may be a difficult example
LINE BREAKING
MEMOIZED LINE BREAKING
AUTOMATIC MEMOIZATION
Stepping back...

• We took a function,
• We added (mutable) storage,
• We wrapped the function so it either:
  – Returns a previously computed result or
  – Computes the result and stores it
• Note that all mutable state is purely internal to the function!
Upcoming events

• [Friday] A5 due

This is memorable.

THIS IS 3110