

Wholeness Statement

Randomized algorithms are efficient with high probability, that is, their worst case behavior is highly unlikely. Quick Select is an example. *Science of Consciousness:* The field of pure consciousness is always efficient and follows the law of least action.

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Another Algorithm Design Pattern

Prune and Search

AKA Decrease and Conquer

Examples:

binary search (earlier from LookupTable)

Downheap (earlier from QuickSort)

quick select

Randomized Algorithms

Quick Sort, Skip Lists (Dictionary/Map),
and Quick Select

Selection

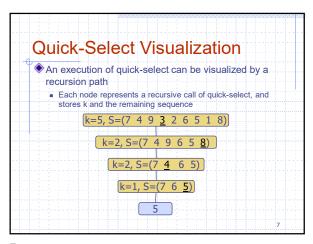
Prune-and-Search
or
Decrease-and-Conquer

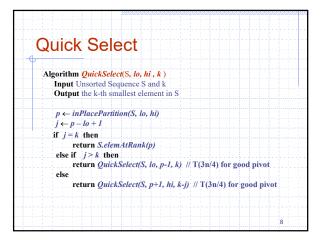
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Quick-Select (§ 4.7) Quick-select is a randomized selection algorithm based on the prune-and-search paradigm: Prune: pick a random element x (called pivot) and partition S into • L elements less than x • E elements equal x • G elements greater than x k > |L| + |E| Search: depending on k, either answer is in E. or we need to =k-|L|-|E|recurse in either L or G $|L| \le k \le |L| + |E|$ (done)

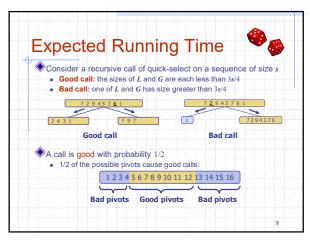
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Recurence Equations

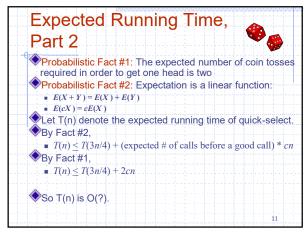
T(n) = a T(n/b) + f(n)

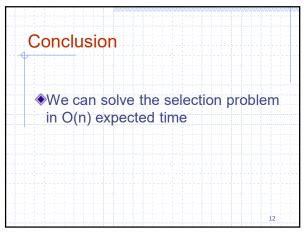
a=number of recursive calls made every time
1/b=fraction of input size that you recurse on
f(n) is the running time of everything except the calls

QuickSelect algorithm
a=1, b=4/3, f(n)=cn (eliminating 1/4 is for good pivot)
T(n)= T(3n/4) + 2cn (the 2 is because of bad pivots)

Master Theorem Case 3 says T(n)=\Theta(f(n))=\Theta(n)

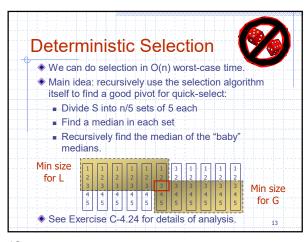
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Main Point

 Prune-and-Search algorithms reduce the search space by some fraction at each step, then the smaller problem is recursively solved

Science of Consciousness: The problem of world peace can be reduced to the smaller problem of peace and happiness of the individual. The problem can be further reduced to the much smaller problem of forming a small group (square root of 1%) practicing the TM and TM-Sidhi program together. Practicing together in groups is Maharishi's approach to making the world better.

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Connecting the Parts of Knowledge with the Wholeness of Knowledge

- Selection can be done by sorting the input, then retrieving the element with the k-th smallest key (O(n log n)).
- Applying the Prune-and-Search algorithm design strategy allows the Selection Problem to be solved in expected O(n)-time.

3. Transcendental Consciousness is the silent, unbounded home of all the laws of nature

- Impulses within Transcendental Consciousness: The dynamic natural laws within this unbounded field follow the law of least action that governs the activities of the universe.
- Wholeness moving within itself: In Unity Consciousness, one experiences the laws of nature as waves of one's own unbounded pure consciousness.

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