CS213/CS213M DS&A
Sharat Chandran

www.cse.iitb.ac.in/~sharat/current/213m
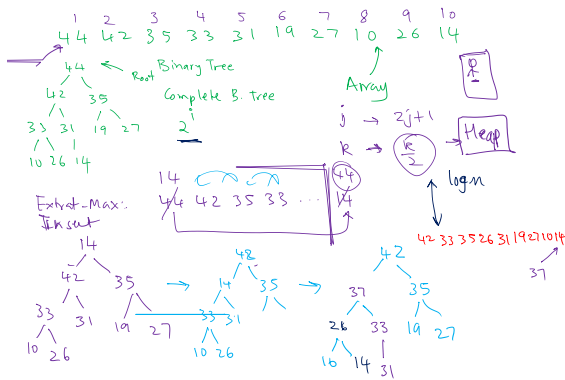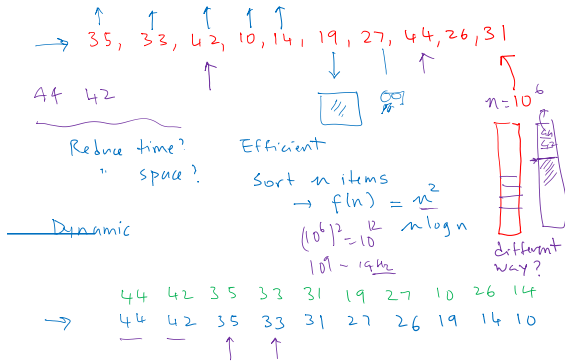

Agenda

- Twitter's banner problem
  - Sort of (this is my version)
- About the instructor
- Course policies
  - Minor
  - ALC

Twitter's Banner Problem

- People periodically post messages
- Problem: Place "most popular" posts on the top of the page dynamically
- Dynamic
  - Don't refresh too often (keep a window or batch of say 5 minutes) and process all posts in that batch
  - However, if there is a super interesting post in the middle of this, update the batch
- Most popular proxy: Large number of followers

$\rightarrow$ 35, 33, 42, 10, 14, 19, 27, 44, 26, 31

44 42

Reduce time?
  "   space?

Dynamic

Efficient

Sort n items
$\rightarrow f(n) = \dfrac{n^2}{}$ $n \log n$

$(10^6)^2 = 10^{12}$
$10^7 \sim 19 h_r$

$n = 10^6$

different way?

44 42 35 33 31 19 27 10 26 14
$\rightarrow$ 44 42 35 33 31 27 26 19 14 10

---

1   2   3   4   5   6   7   8   9   10
44 42 35 33 31 19 27 10 26 14

44 $\leftarrow$ Root   Binary Tree
42   35   Complete B. Tree
33 31 19 27 2^i
10 26 14

Array

$j \rightarrow 2j+1$
$k \rightarrow \dfrac{k}{2}$ Heap

$\log n$

42 33 35 26 31 19 27 10 14

37

Extract-Max:
Insert

14
42 35
33 31
10 26

14   14
14 42 35 33 ... 14

48
14 35
33 31
10 26

42
37 35
26 33 19 27
16 14 31

$\underline{\quad\quad}$ $i = 0 = 2^0 = 1$

$\underline{\quad\quad}$
$\underline{\quad\quad}$
$\underline{\quad\quad}$ $2^i = n \Rightarrow i = \boxed{\log n + 1}$

priority queue

Twitter's Banner Problem

- Who: www.cse.iitb.ac.in/~sharat
- ~~May not~~ Does not know much, but willing to work   hard and do his job
- Assumption: **students** in class , not test-takers