Mar 6

Runtime analysis: $\ell_{max} = \max_{e \in E} \ell_e$

Let n' & m' be the #nodes, #edges in G'

$O(n' + m')$

$= O(\ell_{max}(n+m))$

$m' \leq \ell_{max} \cdot (n+m)$

$n' \leq \ell_{max} \cdot (n+m)$

Recap/Aside: RAM model: unit space is a register

If you have n items, each register has $O(\log n)$ bits

→ All basic ops on $O(1)$ registers is $O(1)$ time.

→ let $\ell_{max} = n^{100}$ ⇒ $100 \cdot \lg n$ bits ⇒ 100 registers ↳ $O(1)$

→ Input size (#registers) $= O(m+n)$

runtime $O(n^{100}(n+m))$

Assume $\ell_{max} = n^{O(1)}$ ⇒ $O(1)$ registers for each ℓ_e

⇒ length $= O(n+m)$

WANT: Ideally runtime $O(m+n)$