Theorem 2

$|R| = r$ with $R$ = set of simultaneous requests.

Cost = $\sum_{r}^{\text{late}} \frac{1}{1}$

"First" : find take
"rest" : find predecessor.

Cost_{Arrow}(R) \leq 2 \cdot \text{Cost}_{\text{opt}}(R) + \text{late}_{R}$
Th. 2 continued

\[ \Rightarrow \quad \text{Cost}_{\text{Average}} = \text{Cost}_{\text{Shortest}} \leq \log r \quad \text{Cost}_{\text{Shortest}} / 2 \leq \log r \quad \text{Cost}_{\text{Min}} \]

\[ \Rightarrow \quad s \leq \log r. \]

But: \( \log r \) result is for general graphs; maybe it is much better for trees?!!

Answer: Maybe... but not much.

(i) size of stem = MAX size of branches

(ii) \( k = \Theta \left( \frac{\log r}{\log b_r} \right) \rightarrow \text{traverse stem } k \text{ times} \rightarrow \text{cost} = \Theta \left( \frac{\log r}{\log b_r} \right) \cdot \text{Cost}_{\text{Extract Tour}} \)

\[ \Rightarrow \quad \Theta \left( \frac{\log r}{\log b_r} \right) \leq s \leq \log r. \quad s \text{ exactly?!?} \]