PS Algorithms for distributed systems

Exercise Sheet 1

https://avs.cs.sbg.ac.at/

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Exercise 1.1

Show using elementary techniques that $(1 - \frac{1}{n})^n \geq \frac{1}{e}$ for $n \geq 2$.

Exercise 1.2

Given a synchronous, non-anonymous ring with n nodes, prove that there exists configurations of IDs for which the Clockwise algorithm from the lecture runs using $\Theta(n)$ and $\Theta(n^2)$ messages respectively.

Exercise 1.3

Given a synchronous, anonymous, uniform ring with n nodes where a leader has already been elected, prove that we can assign unique IDs to each node in $O(n)$ rounds.