The RESET Technique for Multiserver Job Analysis

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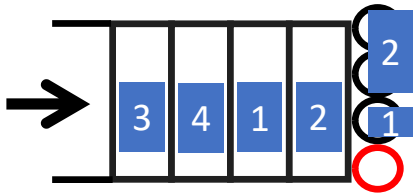
Multiserver-job (MSJ) model

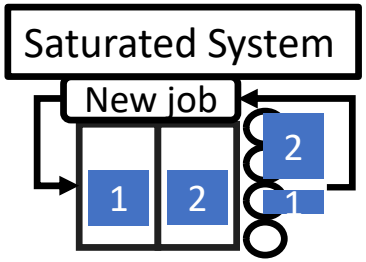


Q: What is the mean response time?

First analysis of mean response time in MSJ FCFS!

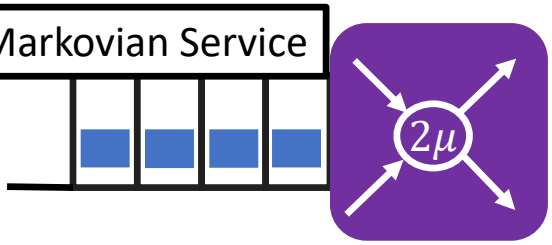
RESET technique: REduction to Saturated for Expected Time

MSJ $\approx$



Well known!

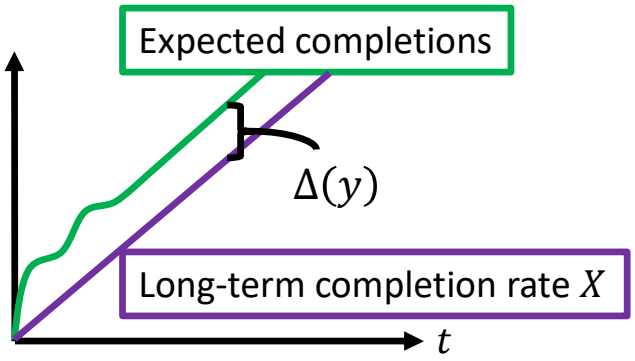
$+$



No closed-form E[T] analysis.

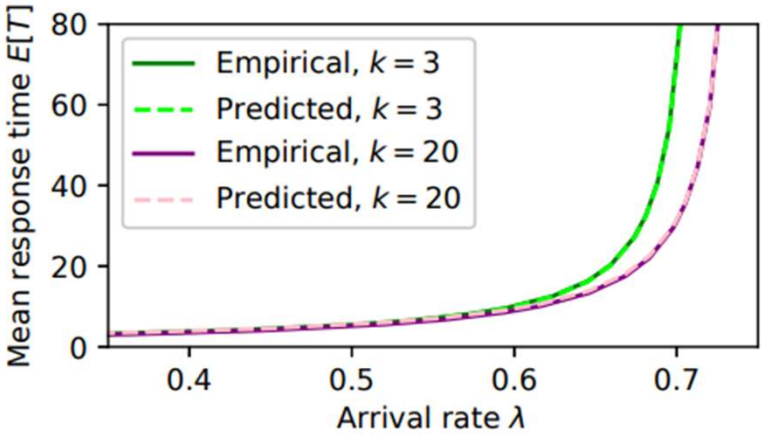
First closed-form analysis of $E[T]$ under Markovian service!

Key idea: Relative completions $\Delta(y)$. $q - \Delta(y)$ has constant drift.



Thm: $E[T^{MSJ}] = \frac{1}{X_{Sat}} \frac{\Delta_{Sat}(Y_{Sat}^{d})+1}{1-\lambda/X_{Sat}} + O_{\lambda}(1)$

where Y_d^{Sat} is the departure-average distribution.



k = 3:

⅓: $(1, Exp(⅓))$

⅓: $(2, Exp(⅔))$

⅓: $(3, Exp(1))$

k = 20:

½: $(1, Exp(1))$

½: $(20, Exp(½))$