

$$\text{Exponential}(\lambda) = \lambda e^{-\lambda t}$$

$$\therefore f_T(t) = \text{Exponential}(1) = e^{-t}$$

\therefore Probability that Alice completes her lap in 1 minute,

$$\text{CDF of Exponential } e^{-t} = 1 - e^{-t}$$

$$\therefore P(T \leq 1) = 1 - e^{-1} \quad \#$$
$$= 0.307799...$$