



$A(t) = N^{\circ} \text{ of arrivals}$
 $C(t) = N^{\circ} \text{ of completions}$

$$\sum_{i \in C(t)} T_i \leq tN \leq \sum_{i \in A(t)} T_i$$

dividing by t

$$\frac{\sum_{i \in C(t)} T_i}{t} \leq \frac{tN}{t} \leq \frac{\sum_{i \in A(t)} T_i}{t}$$

taking limits as $t \rightarrow \infty$

$$\sum_{i \in C(t)} T_i \cdot \frac{C(t)}{t} \leq N \leq \sum_{i \in A(t)} T_i \cdot \frac{A(t)}{t}$$

$$\lim_{t \rightarrow \infty} \sum_{i \in C(t)} T_i \cdot \lim_{t \rightarrow \infty} \frac{C(t)}{t} \leq N \leq \lim_{t \rightarrow \infty} \sum_{i \in A(t)} T_i \cdot \lim_{t \rightarrow \infty} \frac{A(t)}{t}$$

$\downarrow \lambda = X$

$$N = \bar{T}X$$