The system can be described by a continuous time M.C.
Define the state of the M.C. to be the number of operational machines
Time to fix a machine \( \sim \) exponential (mean = \( \frac{1}{\lambda} \))
Time to failure (of any machine) \( \sim \) exponential (mean = \( \frac{1}{\mu} \))
Machines fail independent of each other

\[ P_n = P_0 \left( \frac{\lambda}{\mu} \right)^n \quad \text{for} \quad n = 0, 1, \ldots, m \]

\[ \sum_{n=0}^{m} P_n = 1 \quad \Rightarrow \quad P_0 \sum_{n=0}^{m} \frac{(\lambda/\mu)^n}{n!} = 1 \]

\[ P(\text{no operational machine}) = P_0 = \frac{1}{\sum_{n=0}^{m} \frac{(\lambda/\mu)^n}{n!}} \]

The steady-state portion of time where there is no operational machine = \( P(\text{no operational machine}) \)