Problem 6.4

Q: TPM = ? Y = ?

Solution state space $\in \{0\ 1\}$ (工作 停工) t: 离散

$T = \{t_0\ t_1\ t_2\}$

M_1 operational 0

M_1 non-operation 1

$$P = \begin{bmatrix} 1-f & f \\ r & 1-r \end{bmatrix}$$

$$Y = [\pi(0)\ \ \pi(1)]$$

$$\begin{cases} Y = YP \\ \pi(0) + \pi(1) = 1 \end{cases}$$

$$\begin{cases} \pi(0) = (1-f)\pi(0) + r\pi(1) \\ \pi(1) = f\pi(0) + (1-r)\pi(1) \\ \pi(0) + \pi(1) = 1 \end{cases}$$

$$Y = \left[\frac{r}{r+f}\ \ \frac{f}{r+f}\right]$$

$$\begin{cases} f\pi(0) = r\pi(1) \\ \pi(0) + \pi(1) = 1 \end{cases} \Rightarrow \begin{cases} \pi(0) = \frac{r}{r+f} \\ \pi(1) = \frac{f}{r+f} \end{cases}$$

$f\pi(0) = r(1-\pi(0))$ $\left(1+\frac{f}{r}\right)\pi(0) = 1$ $\frac{r+f}{r+f}\ \frac{r}{r+f}$