

1.

$$\text{전이행렬 } P = \begin{bmatrix} 0.8 & 0.15 & 0.05 \\ 0.25 & 0.7 & 0.05 \\ 0.15 & 0.05 & 0.8 \end{bmatrix}$$

$$(\pi_0, \pi_1, \pi_2) = (\pi_0, \pi_1, \pi_2) \cdot P \quad \text{and} \quad \sum_{j=0}^2 \pi_j = 1$$

$$(\pi_0, \pi_1, \pi_2) = (\pi_0, \pi_1, \pi_2) \begin{bmatrix} 0.8 & 0.15 & 0.05 \\ 0.25 & 0.7 & 0.05 \\ 0.15 & 0.05 & 0.8 \end{bmatrix}$$

$$\begin{cases} \pi_0 = 0.8\pi_0 + 0.25\pi_1 + 0.15\pi_2 \\ \pi_1 = 0.15\pi_0 + 0.7\pi_1 + 0.05\pi_2 \\ \pi_2 = 0.05\pi_0 + 0.05\pi_1 + 0.8\pi_2 \\ 1 = \pi_0 + \pi_1 + \pi_2 \end{cases}$$

$$\Downarrow$$

$$\begin{cases} -0.2\pi_0 + 0.25\pi_1 + 0.15\pi_2 = 0 \\ 0.15\pi_0 - 0.3\pi_1 + 0.05\pi_2 = 0 \\ \pi_0 + \pi_1 + \pi_2 = 1 \end{cases}$$

$$A = \begin{bmatrix} -0.2 & 0.25 & 0.15 \\ 0.15 & -0.3 & 0.05 \\ 1 & 1 & 1 \end{bmatrix}, \quad x = \begin{bmatrix} \pi_0 \\ \pi_1 \\ \pi_2 \end{bmatrix}, \quad b = \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix}$$

$$A \cdot x = b$$

$$x = A^{-1} b = \begin{bmatrix} 0.5111 \\ 0.2888 \\ 0.2 \end{bmatrix}$$

점유율 : A 회사 : 51.11%

B 회사 : 28.89%

C 회사 : 20%