ace in the long run, the market share of COKE and PEPSI will be 66.67% and 33.33%, respectively

EXAMPLE 2: In a certain market, there are three brands of LIPSTICKS A, B and C. Given that a lady purchase lipstick of brand A there are 70% chance that she would continue with brand A, 20% and 10% chances that she would shift to brand B and C respectively. Given that a lady last purchased lipstick of brand B, there is 50% chances that she would shift to brand A and 10% to brand C. If she purchase brand C, there is 60%, 20% chance that she would shift to brand A and B resp. The present market share of 3 brands is 60%, 30% and 10% resp. Using this information, find market share of the brands A, B and C in steady state.

Solution

Let $q = [p_1\ p_2\ p_3]$ with $p_1+p_2+p_3=1$ be the stationary distribution such that.

$$qP = q.$$

$$[p_1\ p_2\ p_3] \begin{bmatrix} 0.7 & 0.2 & 0.1 \\ 0.5 & 0.4 & 0.1 \\ 0.6 & 0.2 & 0.2 \end{bmatrix} = [p_1\ p_2\ p_3]$$