Homefun

(1) The Leslie model describes age-Specified Population growth, as follows. Let the oldest age attained by the females in some animal Population be 9 years. Divide the population into three age classes of 3 years each. Let the Leslie matrix be,

$$L = l_{jk} = \begin{bmatrix} 0 & 2.3 & 0.4 \\ 0.6 & 0 & 0 \\ 0 & 0.3 & 0 \end{bmatrix}$$

(i) What is the number of females in each class after 3, 6, 9 years if each class initially Consists of 400 females ?

(ii) For what initial distribution will the number of females in each class change by the Same Proportion ? What is this rate of change ?

Solution:

i) $X_3 = \begin{bmatrix} 1080 \\ 240 \\ 120 \end{bmatrix}$, $X_6 = \begin{bmatrix} 600 \\ 648 \\ 72 \end{bmatrix}$, $X_9 = \begin{bmatrix} 1519.2 \\ 360 \\ 194.4 \end{bmatrix}$

ii) $\lambda = 1.2$, $X_1 = \begin{bmatrix} 1 \\ 0.5 \\ 0.125 \end{bmatrix}$

Class I, II, III : 738, 369, 92