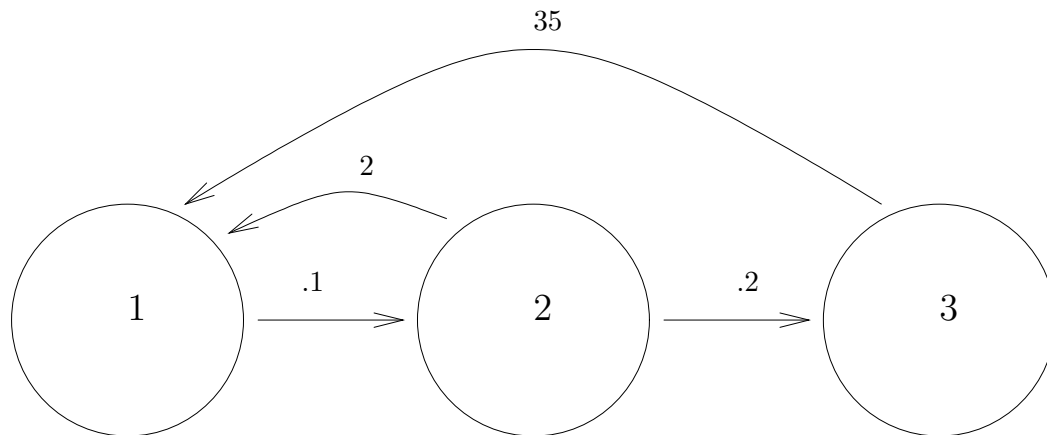


Homework assigned Wednesday, February 16.

For the loop diagram



- (1) What is the Leslie matrix? *Answer:* $A = \begin{bmatrix} 0.0 & 2.0 & 35.0 \\ 0.1 & 0.0 & 0.0 \\ 0.0 & 0.2 & 0.0 \end{bmatrix}$
- (2) Let the initial age distribution be

$$\mathbf{n}(0) = \begin{bmatrix} 1000 \\ 400 \\ 80 \end{bmatrix}$$

(a) Find $\mathbf{n}(20)$. *Answer:* $\mathbf{n}(20) = \begin{bmatrix} 1200 \\ 140 \\ 28 \end{bmatrix}$

- (b) What is the proportion (or if you like the percentage) in each age group for $\mathbf{n}(20)$? *Answer:* One year olds .88, two year olds .10, three year olds 0.2

(c) Find $\mathbf{n}(50)$. *Answer:* $\mathbf{n}(50) = \begin{bmatrix} 420 \\ 43 \\ 9.0 \end{bmatrix}$

- (d) What is the proportion in each age group for $\mathbf{n}(50)$? *Answer:* One year olds .89, two year olds .092, three year olds 0.019

- (3) Let the initial age distribution correspond to starting with 3000 one year olds and no one else. That is

$$\mathbf{n}(0) = \begin{bmatrix} 3000 \\ 0 \\ 0 \end{bmatrix}$$

- (a) Find $\mathbf{n}(20)$. *Answer:* $\mathbf{n}(20) = \begin{bmatrix} 570 \\ 44 \\ 11 \end{bmatrix}$
- (b) What is the proportion in each age group for $\mathbf{n}(20)$? *Answer:*
One year olds .91, two year olds .070, three year olds 0.018
- (c) Find $\mathbf{n}(50)$. *Answer:* $\mathbf{n}(50) = \begin{bmatrix} 160 \\ 17 \\ 3.5 \end{bmatrix}$
- (d) What is the proportion in each age group for $\mathbf{n}(50)$? *Answer:*
One year olds .89, two year olds .093, three year olds 0.019