Mathematics 172

Quiz #15 Name: Key

You must show your work to get full credit.

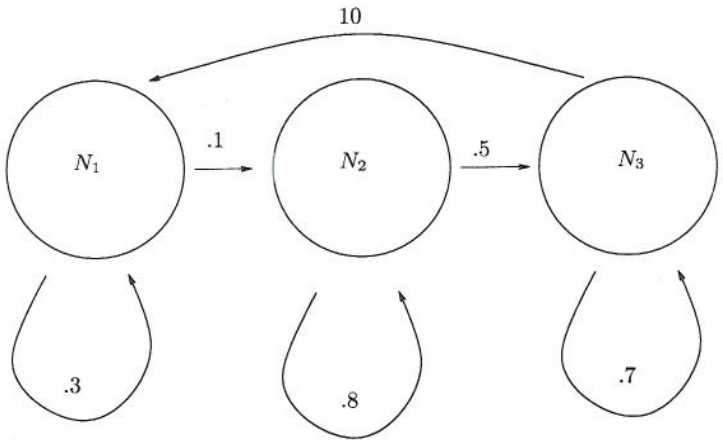

FIGURE 1

A species of weed has survival rates and per capata growth rates given by the diagram above. Here N_1 is the number of seeds, N_2 is the number of juveniles, and N_2 the number of adults. If 10 of the seeds are blown into a yard,

(1) What is the Lefkovitch matrix?

1 pt

$$\begin{bmatrix} .3 & 0 & 10 \\ .1 & .8 & 0 \\ 0 & .5 & .7 \end{bmatrix}$$

(2) How many one, two and three year olds are there after 20 years?

2 pts

$N_{1,20} =$ 2548.

$N_{2,20} =$ 411.

$N_{3,20} =$ 285

(3) What is the stable age distribution (use $t = 20$ years to compute this).

Total = 2548 + 411 + 285
= 3243

2 pts.

percent of one year olds = $\frac{2548}{3242} = 78.5\%$

percent of two year olds = $\frac{411}{3242} = 12.7\%$

percent of three year olds = $\frac{285}{3242} = 8.8\%$