

A population exhibits the characteristics described below.

Age Group (in years)	Birth Rate	Survival Rate
0 – 5	0	0.5
5 – 10	0.7	0.8
10 – 15	1.2	0.9
15 – 20	0.8	0.9
20 – 25	0.7	0.7
25 – 30	0.2	0.4
30 – 35	0	

The initial population distribution is given below.

Age Group	0-5	5-10	10-15	15-20	20-25	25-30	30-35
Original Count	30	30	26	28	32	15	10

- 1.) Give the survival rate for the 30-35 year-old group.
- 2.) Give the birth rate for the 10–15 year-old group, the 20-25 group, and the 30–35 group.
- 3.) Give the survival rate for the newborns, the 5-10 group, and the 25-30 group.
- 4.) Construct the Leslie Matrix (L) for this animal population.
- 5.) Construct the Initial Population matrix (IP).
- 6.) Construct the “ones” matrix (Ones).
- 7.) How many cycles would there be in 5 years? 10 years? 25 years?
- 8.) Using matrix multiplication, how would you find the age distribution after 25 years?
- 9.) Give the population distribution after 25 years.
- 10.) Using matrix multiplication, how would you find the total population after 25 years?
- 11.) Give the total population after 25 years.
- 12.) Determine the Long-Term Growth Rate for this population to the nearest percent.
- 13.) If the maximum sustainable population in its native habitat is 12,000 animals, when will this population be reached? (in cycles) \_\_\_\_\_ (in years) \_\_\_\_\_

A population exhibits the characteristics described below.

Age Group (days)	Birth Rate	Survival Rate
0 – 3	0.2	0.7
3 – 6	0.6	0.8
6 – 9	1.2	0.9
9 – 12	0.8	

The initial population distribution is given below.

Age Group	0-3	3-6	6-9	9-12
Original Count	10	20	30	20

- 14.) Give the birth rate for the 3-6 day-old group.
- 15.) Give the survival rate for the newborns.
- 16.) Give the survival rate for the 9-12 day-old group.
- 17.) Construct the Leslie Matrix (L) for this animal population. Give  $L_{13}$ ,  $L_{21}$ ,  $L_{34}$ ,  $L_{41}$
- 18.) Construct the Initial Population matrix (IP). Give  $IP_{11}$ ,  $IP_{12}$ ,  $IP_{31}$ ,  $IP_{13}$
- 19.) How many cycles would there be in 12 days? 15 days? 30 days?
- 20.) Give the population distribution after 6 days.
- 21.) How many newborns are there after 12 days?
- 22.) What is the total population after 30 days?
- 23.) Determine the Long-Term Growth Rate for this population to the nearest percent.
- 24.) How many days will it take for the population to exceed 20,000?