

TRANSITION DIAGRAMS AND MATRICES

A car rental firm has two branches: one in Colac and one in Bendigo. . Cars are usually rented and returned in the same town, but a small proportion of cars rented in Colac are returned to Bendigo and vice versa. The following weekly data has been compiled by the company:

- 80% or 0.8 of cars rented each week in Bendigo are returned to Bendigo
- 20% or 0.2 of cars rented each week in Bendigo are returned to Colac
- 10% or 0.1 of cars rented each week in Colac are returned to Bendigo
- 90% or 0.9 of cars rented each week in Colac are returned to Colac.

TRANSITION DIAGRAM

A Transition Diagram gives a visual display of how the transitions between states occur each week.

TRANSITION MATRIX

A transition matrix is another way of displaying the transition diagram. The percentages are turned to proportions.

NOTE: The columns in the Transition Matrix add up to 1

EXAMPLE: Another car rental firm has three branches: one in Albury another in Wodonga and a third in Sale. The company has found that the week by week return rates for cars hired out at the three locations follows the following proportions:

- 70% of cars hired out at Albury are returned to Albury
- 10% of cars hired out at Albury are returned to Wodonga
- 80% of cars hired out at Wodonga are returned to Wodonga
- 5% of cars hired out at Wodonga are returned to Albury
- 11% of cars hired out at Sale are returned to Albury
- 4% of cars hired out at Sale are returned to Wodonga.

b. Create a Transition Diagram to reflect this information.

c. Create a Transition Matrix to reflect this information. (Check that the columns add up to 1).