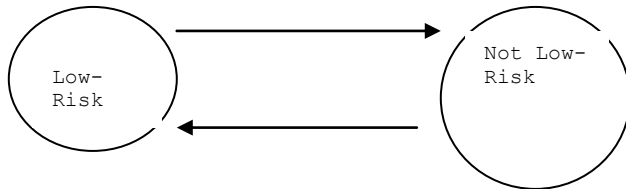


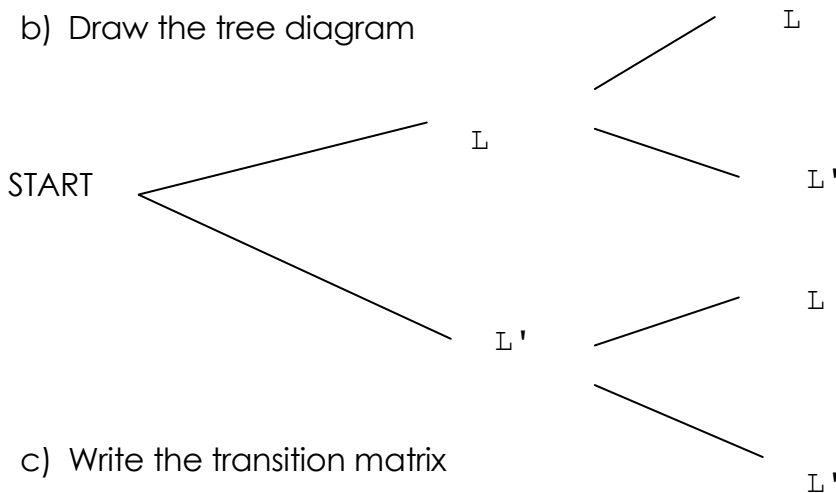
- 1) A new grocery store has just opened. From past observations of new stores it has been determined that 70% of people who go to the new grocery store will go again next week, while 20% of the people who went to the old grocery store will go to the new store next week.
- A. Set up the transition matrix for this situation. ***Label your rows and columns*** with new and old.
- B. If during grand opening week, 60% of the people went to the new grocery store. Set up the initial-state matrix for this situation.
- C. What percentage of the people will be going to the new grocery store 3 weeks after the grand opening? Clearly show what matrices you multiplied. Give answer to one decimal place.
- D. What percentage of people will be going to the new grocery store in the long run?

2) An insurance company classifies drivers as low – risk if they are accident – free for 1 year. Past records indicate that 98% of the drivers in the low – risk category (L) on year will remain in that category the next year, and 78% of the drivers who are not in low – risk category (L') one year will be in the low – risk category the next year.

a) Draw the transition diagram



b) Draw the tree diagram



c) Write the transition matrix

d) If 90% of the drivers in the community are in the Low-Risk category this year, what is the probability that a driver chosen at random from the community will be in the low-risk category next year?

e) If 90% of the drivers in the community are in the Low-Risk category this year, what is the probability that a driver chosen at random from the community will be in the low-risk category in the Year after that next year?

3) Mice in a certain experiment involving a choice between path A and B are observed to have the following pattern:  
Of those who choose path A one day, 30% choose path A the next day and 70% choose path B, while of those who choose path B one day, 80% choose path B the next day and 20% choose path A.

a) Set up the transition matrix for this situation.

b) If 50% of mice choose path A on Monday and 50% of mice choose path B, what percentages choose each path on Tuesday?

c) If 50% of mice choose path A on Monday and 50% of mice choose path B, what percentages choose each path on Wednesday?

d) If 50% of mice choose path A on Monday and 50% of mice choose path B, what percentages choose each path on Sunday?

e) In the long run, what portion of the mice choose path A each day and what portion of mice choose path B?