

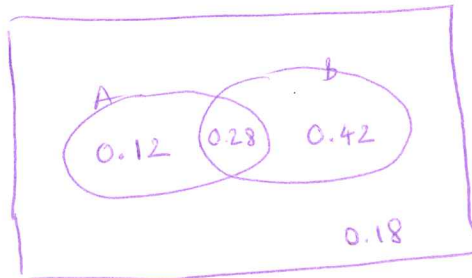
Quiz 3

February 3, 2015

1. You are given two independent events A and B where $P(A) = 0.4$, $P(B) = 0.7$.

(a) Find the chance that both A and B occur and draw a Venn's Diagram.

Since A and B are independent, $P(A \cap B) = P(A) \cdot P(B) = 0.28$



(b) What is the probability that either A occurs or B occurs.

$$P(A \cup B) = 0.12 + 0.28 + 0.42 = 0.82$$

$$\text{(or } 0.4 + 0.7 - 0.28 = 0.82\text{)}$$

(c) Given that either A occurs or B occurs, what is the chance that only A occurs.

The chance is

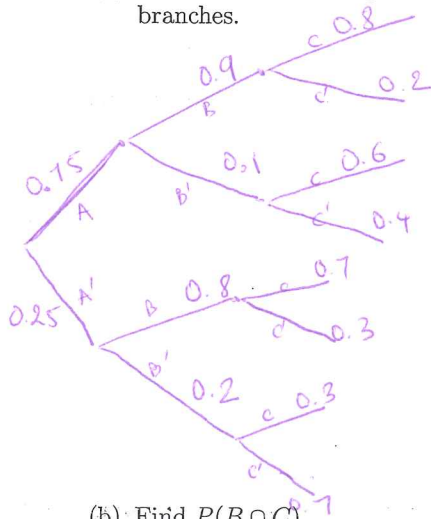
$$\frac{0.12}{0.82} = 0.14634\dots$$

2. For customers purchasing a refrigerator, we sequentially define 3 events:

- A : the event that the refrigerator was manufactured in the U.S.
- B : the event that the refrigerator had an icemaker
- C : the customer purchased an extended warranty

You are given that: $P(A) = 0.75$, $P(B|A) = 0.9$, $P(B|A') = 0.8$, $P(C|A \cap B) = 0.8$, $P(C|A \cap B') = 0.6$, $P(C|A' \cap B) = 0.7$, $P(C|A' \cap B') = 0.3$.

(a) Construct a tree diagram where A , B , C corresponds to the first-, second-, and third branches.



(b) Find $P(B \cap C)$

$$0.75(0.9)(0.8) + (0.25)(0.8)(0.7) = 0.68$$

(c) Find $P(A|B \cap C)$

$$\frac{0.75(0.9)(0.8)}{0.68} = \frac{0.54}{0.68} = 0.79411$$