Jordan Landers
May 8, 2018
Unit 3, Lesson 2, Project 6

1. $P(B|A) * \dfrac{P(A)}{P(B)} = \dfrac{P(B|A)P(A)}{P(A)P(B|A) + P(\sim A)P(B|\ A)}$

$$P(B) = P(A)P(B|A) + P(\sim A)P(B|\sim A)$$

$$\begin{aligned} P(+) &= P(TD^+)P(+|TD^+) + P(-)P(TD^+|-) \\ &= (.005)(.98) + (1 - .005)(.1) \\ &= .1044 \end{aligned}$$

2. $$\begin{aligned} P(+|TD^+) &= P(B|A) \\ &= .98 \end{aligned}$$

3. $$\begin{aligned} P(\sim B|\sim A) &= 1 - P(B|\sim A) \\ P(-|TD^- &= 1 - .1 \\ &= .9 \end{aligned}$$

4. $$\begin{aligned} &1 - (P(A \cap B) + P(\sim A \cap \sim B)) \\ &1 - (P(A|B)P(B) + P(\sim A|\sim B)P(\sim B)) \\ &1 - (P(B|A)P(A) + P(\sim B|\sim A)P(\sim A)) \\ &1 - (P(B|A)P(A) + P(\sim B|\sim A)(1 - P(A))) \\ &1 - ((.98)(.005) + (.9)(1 - .005)) \\ =&.0996 \end{aligned}$$