Review:

Monday, April 9, 2018 8:35 AM

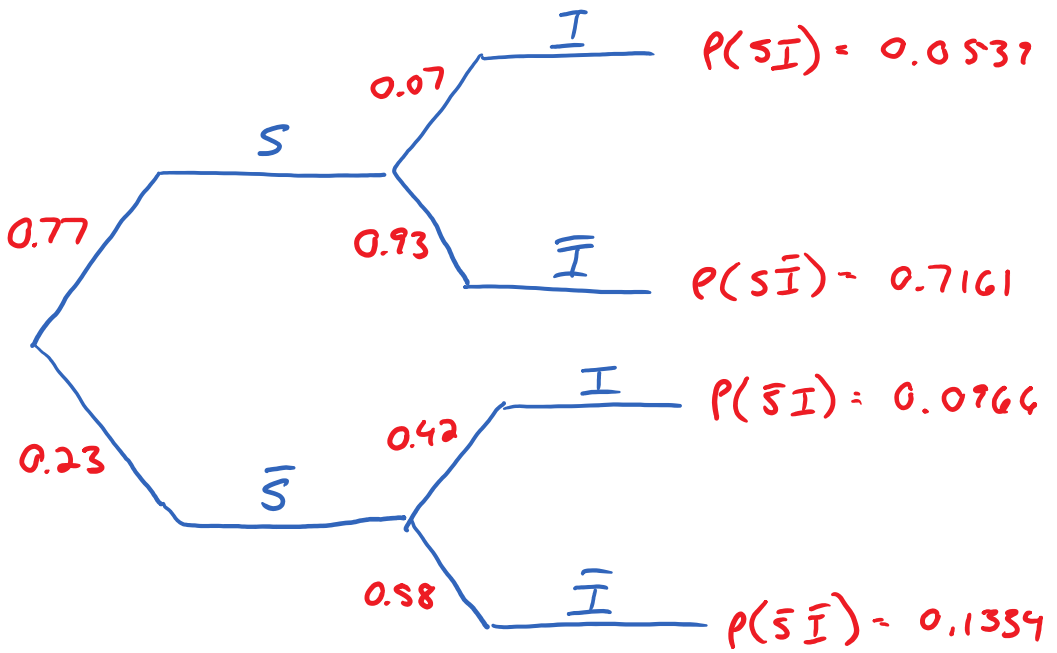
let S = seatbelt, I = injured

The probability of a randomly selected driver wearing a seatbelt is 77%. If the driver is then in an accident, the probability of being uninjured is 93% for a seatbelted driver, while the probability of being uninjured is 58% for an unseatbelted one. If the driver is injured in an accident what is the probability that they weren't wearing a seat belt?

$P(S)$

$P(\bar{I} \mid S)$

$P(\bar{I} \mid \bar{S})$



$$P(\bar{S} \mid I) = \frac{P(\bar{S}I)}{P(I)} = \frac{0.0966}{0.0966 + 0.0539}$$

$$= 0.64186 = \boxed{64\%}$$

Are "not wearing a seatbelt" and "being injured" independent?

$$P(\bar{S} \mid I) \stackrel{?}{=} P(\bar{S})$$

$$64\% \stackrel{?}{=} 23\% \qquad \therefore \text{ dependent}$$

At the end of the school year, the Bridge students held a raffle. Each of the fifty students bought a ticket and then three winning tickets were chosen at random. First prize was a 12 pack of beer, a new car, and third prize was a high-five from the dean.

a) What's the probability that Isaac wins first prize, Joel wins second prize, and Adam wins third prize?

b) What's the probability that Isaac, Joel, and Adam between them win all three prizes?

a) ordered arrangement of r objects chosen without repetition from n possibilities: permutation

$$P(IJA) = \frac{n(IJA)}{n_{tot}} = \frac{1}{{}_{50}P_3} = \frac{1}{117600}$$

$$\approx 8.5 \times 10^{-6}$$

b) unordered.

$$P(IJA) = \frac{n(IJA)}{n_{tot}} = \frac{1}{{}^{50}C_3} = \frac{1}{19600} \approx 5.1 \times 10^{-5}$$