**Homework 1**

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# HW 1.1:

Find the probability Chad got a car given he went to the beach aka P(Car | Beach), given:

The first step is to work backward to the given variables above.

Now let’s start working back to our original formula:

With our given variables

The answer is 87.17%.

# HW 1.2

## a)

Serial Sensitivity = .98\*.92\*.93 = .8385

Serial Specificity = 1-(1-.92)\*(1-.88)\*(1-.87) = .998752

## b)

Parallel Sensitivity = 1-(1-.98)\*(1-.92)\*(1-.93) = .999888

Parallel Specificity = .92\*.88\*.87 = .704352

## c)

.8385\*.05/[(.8385\*.05)+(1-.998752)\*.95] = .9724

.999888 \*.05/[(.999888\*.05)+(1-.7044)\*.95] = .1511

# HW 1.3

P(Knows) = .7, P(Guess) = .3, P(Correct|Guess) = .25, P(incorrect|Guess) = .75

## a)

Given these are two independent events P(both correct) = P(1 correct) \* P(2 correct). Given that they both have the same rules we can just say P(both correct) = P(correct)2

P(correct) = P(Knows)\*P(Guess)\*P(Correct|Guess) = .7+.3\*.25 = .775

P(both correct) = .7752 = .600625

## b)

P(correct) = .775

Find P(both known | both correct) = P(both known ∩ both correct)/ P(both correct)

P(both known ∩ both correct) = P(known ∩ correct)2 = .72= .49

P(both correct) = P(correct)2 = .7752 = .6006

.49/.6006 = .81582

## c)

Given that both solutions are less than 1 and greater than 0, as the value of n approaches infinity, our answers will each approach 0 but will technically never be 0.