**BINGO BONUS (10 POINTS):**

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Let’s consider the logistic regression model, which we will refer to as Model 1, given by

log(pi / [1-pi]) = 0.25 + 0.32\*X1 + 0.70\*X2 + 0.50\*X3

In the above formula, X3 is an indicator variable with X3=0 if the observation is from Group A and X3=1 if the observation is from Group B.

1. For X1=2 and X2=1 compute the **log-odds** for each group, i.e. X3=0 and X3=1.

Log-odds A = 0.25+0.32\*2+0.7\*1+0.5\*0 = 2.99

Log-odds B = 0.25+0.32\*2+0.7\*1+0.5\*1 = 3.49

1. For X1=2 and X2=1 compute the **odds** for each group, i.e. X3=0 and X3=1.

Odds A = exp(2.99) = 19.89

Odds B = exp(3.49) = 32.79

1. For X1=2 and X2=1 compute the **probability** of an event for each group, i.e. X3=0 and X3=1.

P(x) = Odds/(1+ Odds), so

P(A) = 19.89/(1+19.98) = 0.9521

P(B) = 32.79/(1+32.79) = 0.9704

1. Using the equation for Model 1, compute the relative odds associated with X3, i.e. the relative odds of Group B compared to Group A.

Log-odds B:A = 3.49, Log-odds A = 2.99, 3.49/2.99 = 1.17

1. Use the odds that you found in QUESTION 2 to compute the relative odds of Group B to Group A. How does this number compare to the result in Question #4. Does this make sense?

Odds-ratio for B:A = 32.79/19.89 = 1.65

The numbers are different, and the fact they are different makes sense, one is dividing odds, the other is dividing the logs of odds. It is worth noting you can’t just take the exp() of the log-odds ratio and get the odds-ratio, unless I really messed up on the math.

HOW TO SUBMIT YOUR BINGO BONUS WORK:

1. Rename Your DOC File to be LOGIT\_ANALYSIS\_lastname\_firstname.docx
2. Email the DOC File to your Instructor