Homework 5

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1. (1 point) ISLP 4.8 problem 6.

   a)
   -6 + 0.05(40) +1(3.5) = -0.5
   Probability = e^-0.5/(1+e^-0.5) = 0.6065/1.6065 = 0.3775 => 37.8% chance

   b)
   0 = -6 + 0.05(X1) + 1(3.5)
   0.05(X1) = 2.5
   X1 = 50 hours to have a 50% chance of getting an A in the class

2. (1 point) ISLP 4.8 problem 7.
   P(D=1 | X=4) = 0.4852/0.6453 = 0.7519 => 75% chance of issuing dividends

3. (1 point) ISLP 4.8 problem 9.
   a)
   P = 0.37/1.37 = 0.2700 => 27% of people of odds 0.37 will default

   b)
   Odds = 0.16/0.84 = 0.1905 odds

4. (1 point) ISLP 4.8 problem 13b. (Python) Use the Weekly data (link below) and build a Logistic Regression model to predict Direction. Use the summary function to print results.
   On colab
5. (1 point) ISLP 4.8 problem 13c. (Python) Create a confusion matrix and explain what types of mistakes are being made.
   On colab
6. (1 point) Compute the sensitivity and specificity of your model from 5.
   On colab
7. (1 point) ISLP 4.8 problem 13d. (Python) Build a new Logistic Regression model using only Lag 2 and using years 1990 - 2008 as training data. Use the summary function to print results.
   On colab
8. (1 point) Create a confusion matrix AND compute sensitivity and specificity. Comment on your model's performance compared to the first model.
   On colab
9. (1 point) ISLP 4.8 problem 13e. (Python) Use Linear Discriminant Analysis to fit a model to predict UP/DOWN based only on Lag2.
   On colab

10. (1 point) Create a confusion matrix AND compute sensitivity and specificity. Comment on your model's performance compared to others.
    On colab

Many problems should be solved using Python. The following notebook has been initialized with the packages and data that you need : link here

https://colab.research.google.com/drive/1BdbJjtKm_enEKWIpvHizjCnKVRy9vJwo?usp=sharing