Math 327 – Chapter 6 and 7 Review Questions – Homework due Nov. 3.

1. Fill in each of the blanks below with the word ‘high’ or ‘low’ corresponding to the diagram at the right.

|  |  |
| --- | --- |
| \_high\_ Precision  \_\_high\_\_ Accuracy |  |
| \_high\_ Precision  \_\_low\_\_ Accuracy |  |
| \_\_low\_ Precision  \_\_high\_ Accuracy |  |
| \_low\_\_ Precision  \_\_low\_ Accuracy |  |

1. In this first-order model,

What is the interpretation of ?

*β1 represents the change in mean response E{Y} per unit increase in Xi1 when Xi2 is held constant*

What is the interpretation of ?

*β2 represents the change in mean response E{Y} per unit increase in Xi2 when Xi1 is held constant*

1. For each of the following regression models, indicate whether it is a general linear regression model. If it is not, state whether it can be expressed as a general linear regression model of the form, , by a suitable transformation:  
   1. Yes, this is a general linear regression model
   2. No as is, but it can be transformed into a linear regression model.
   3. No this is not a linear regression model because the log10 includes the slope β1 which means the slope coefficients are not linearly related.
   4. No as is, but it can be transformed into a linear regression model
   5. No as is, but it can be transformed to a general linear regression model
2. For this regression function, , where

Salary in $1000’s

Years on the job

Write the sub-model for each of these four conditions:

1. Males without a bachelor’s degree:
2. Males with a bachelor’s degree:
3. Females without a bachelor’s degree:
4. Females with a bachelor’s degree:
5. Interpret the parameter,

*represents the change in mean salary response E{Y} per change in X3 when X1 and X2 are held constant.*

1. Complete this diagram with the component sums of squares using the ANOVA tables that follow it:

X1

X2

X3

386

30

2150

3007

494 301

201 3328

|  |  |
| --- | --- |
| Response: Y  Df Sum Sq  X1 1 6037  X2 1 331  X3 1 201  Residuals 32 3328 | Response: Y  Df Sum Sq  X1 1 6037  X2 1 331  Residuals 33 3530 |
| Response: Y  Df Sum Sq  X1 1 6037  X3 1 502  X2 1 30  Residuals 32 3328 | Response: Y  Df Sum Sq  X2 1 3724  X3 1 695  Residuals 33 5478 |
| Response: Y  Df Sum Sq  X2 1 3724  X3 1 695  X1 1 2150  Residuals 48 3328 | Response: Y  Df Sum Sq  X3 1 4003  X1 1 2536  Residuals 33 3358 |