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

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 ?

indicates the change in the mean response E{Y} per unit increase in X1 when X2 is held constant.

What is the interpretation of ?

indicates the change in the mean response per unit increase in X2 when X1 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 expression as a general linear regression model of the form, , by a suitable transformation:  
   1. Does not show a linear regression model, however, can be transformed into a linear regression model.
   2. Does not show a linear regression model, however, can be transformed into a linear regression model.
   3. Does not show a linear regression model and cannot be transformed into a linear regression model.
   4. Does not show a linear regression model and cannot be transformed into a linear regression model.
   5. Does not show a linear regression model, however, can be transformed into a 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,

It indicates the change in mean response per unit increase in X3 when X2 and X1 are held constant. Also, it is the coefficient for when the subject does have a bachelor’s degree.

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

X1

X2

X3

30

386

2150

3007

301

494

3328

201

|  |  |
| --- | --- |
| 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 |