

Lab 11

Linear Regression Analysis

Overview of Lab Session:

In this lab we use data to test for a linear relationship between two variables. We use data from a study designed to identify risk factors associated with giving birth to a low birth weight baby (by definition a baby is a low birth weight baby if the birth weight is less than 2500 grams). Data were collected at Baystate Medical Center, Springfield, Massachusetts during 1986. (1)

Some of the possible risk factors considered in the study are age, weight of the mother just before pregnancy, race, and the number of physician visits during the first trimester of pregnancy.

I. Get Started

Use your ID number and password to log onto the computer.

Load the data www.csulb.edu/~saleem/Course-F08-503/Data/bwt.sav

II. Linear Regression

We test for a linear relationship between age of mother (AGE) and birth weight (BWT). We also test for a linear relationship between weight of mother (MWT) and birth weight of baby (BWT).

STEP 1 Find the Regression Line for Birth Weight and Mother's Age

From the top menu choose *Analyze > Regression > Curve Estimation*

For the *dependent* variable choose *Birth Weight (BWT)*

For the *independent* variable choose *Mothers Age (AGE)*

In the Models box check *Linear*

Choose OK and note results

STEP 2 Find the Regression Line for Birth Weight and Mother's Weight

Repeat Step 1 for the for the variables *Birth Weight (BWT)* and *Mothers Weight(LWT)*

1 Data from the internet with reference to Hosmer and Lemeshow (2000) Applied Logistic Regression: Second Edition, Wiley.

Worksheet for Lab 11

1. Use the SPSS output to answer the following about the relationship between Birth Weight and Mother's Age.

(a) What is the value of the correlation coefficient between BWT and AGE? Does this coefficient indicate a strong linear association between these two variables?.

(b) Write the regression equation to predict the baby's weight from the mother's age.

(c) What is the *predicted value* of the baby's weight if the mother's age is 30?

(d) If the mother's age is 30 and the baby's weight is 2000 g what is the residual?

2. Use the SPSS output to answer the following about the relationship between Birth Weight and Mother's Weight.

(a) What is the value of the correlation coefficient between BWT and MWT? Is there a stronger linear association between these variables than the ones in Question 1 ?.

(b) Write the regression equation to predict the baby's weight from the mother's weight.

(c) If the baby's weight is always 1/20 of the mothers weight then there is a perfect correlation between these variables. Write the regression equation if this is the case?
