

Practice 4.1 (Level 1): Generating an ANCOVA Model

Task

In this practice, you generate an ANCOVA model on the **mydata.school** data set using PROC GLM.

Reminder: Make sure you've defined the **mydata** library.

1. You're interested in determining the effect of **Words1** and **Gender** on **Reading3** scores. Write a PROC GLM step to generate an ANCOVA plot and perform an analysis of covariance on the **mydata.school** data set. Use the test for the interaction term to determine whether both slopes are equal.

```
proc glm data=mydata.school;
  class Gender;
  model Reading3=Gender Words1 Gender*Words1;
run;
quit;
```

Examine the results.

The ANCOVA plot suggests that the slopes might be unequal, but the intercepts do not seem to be significantly different.

The interaction term tests whether the slope parameters are equal. Presuming an alpha equal to 0.05, you reject the null hypothesis. There is sufficient evidence to conclude that the slope parameters for the two groups are not equal.

2. Generate the most appropriate model and use the SOLUTION option. Use the parameter estimates to write the regression equation for each gender.

```
proc glm data=mydata.school;
  class Gender;
  model Reading3=Gender|Words1 / solution;
run;
quit;
```

Examine the results and use the parameter estimates to write the equations.

The equation for **Gender=M** is:

$$\text{Reading3} = 17.17307 + 1.65070 * \text{Words1}$$

The equation for **Gender=F** is:

$$\text{Reading3} = (17.17307 - 7.45084) + (1.65070 + 0.62716) * \text{Words1} = 9.72223 + 2.27786 * \text{Words1}$$

3. How do you interpret the significant term **Words1ByGenderF** for this model?

The slopes for **Words1** are different between male students and female students.

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