Problem Set #7
Sonoma State University
Economics 317- Introduction to Econometrics

Analyzing Male-Female Wage Differentials Part II
using Dummy, Interaction and Non-linear Variables

Based on your regression model from problem set #6

\[
\text{Wage} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + U.
\]
Where \( X_1 \) = Experience.

\( X_2 \) = Female.

\( X_3 \) = Interaction variable between experience and female.

(a) Construct a variable to account for a non-linear relationship between wages and experience. Write out your new regression model and explain and interpret the variables.

(b) (i) What are the expected signs of the coefficients?
(ii) Write out the regression equation for men.
(iii) Write out the regression equation for women.

(c) Estimate the above equation:
(i) How much of the variation in wages is explained by the model.
(ii) Interpret your estimated coefficients. Are your estimated coefficients significant?
(iii) Show your regression equations graphically in a scatter diagram. Describe your graph.

(d) Construct a variable that allows for differing rates of diminishing returns between men and women. Write out your new regression model and explain and interpret the variables.

(e) (i) What are the expected signs of the coefficients?
(ii) Write out the regression equation for men.
(iii) Write out the regression equation for women.

(f) Estimate the above equation:
(i) How much of the variation in wages is explained by the model.
(ii) Interpret your estimated coefficients. Are your estimated coefficients significant?
(iii) Show your regression equations graphically in a scatter diagram. Describe your graph.