SMM634 Exercises - Regression with Dummy Variables

1. The data for this exercise are contained in `wage1` from the R package `wooldridge`. The full description of the variables can be found here:

   `https://cran.r-project.org/web/packages/wooldridge/wooldridge.pdf`.

   (a) Using R install the package and load the data.

   (b) Fit the following linear model:

   $$\texttt{wage} = \alpha + \beta_1 \texttt{female} + \beta_2 \texttt{educ} + \beta_3 \texttt{exper} + \beta_4 \texttt{tenure} + \epsilon$$

   (c) Interpret the estimated coefficient $\hat{\alpha}$.

   (d) Comment of significance and meaning of the coefficient associated with `female`.

   (e) Now, fit the following linear model:

   $$\texttt{wage} = \alpha + \beta_1 \texttt{female} + \epsilon$$

   (f) Comment on the estimated coefficients of α and β_1.

   (g) Compare the estimate for β_1 obtained when fitting model in (b) and model in (e).

   (h) Carry out a comparison of means test between the two groups, which in this case are men and women. Comment on the results.

   (i) Modify the model fitted in (b) such that the new model allows the effect of `educ` to vary by gender. Is this model supported by the data?