W271-2 – Spring 2016 – **HW 3**

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Contents

Exercises

Question 1

Load the `twoyear.RData` dataset and describe the basic structure of the data.

```
load("twoyear.RData")
```

Question 2

Typically, you will need to thoroughly analyze each of the variables in the data set using univariate, bivariate, and multivariate analyses before attempting any model. For this homework, assume that this step has been conducted. Estimate the following regression:

$$\begin{aligned}\log(\textbf{wage}) = \beta_0 + \beta_1\textbf{jc} + \beta_2\textbf{univ} + \beta_3\textbf{exper} + \beta_4\textbf{black} + \beta_5\textbf{hispanic}\\ + \beta_6\textbf{AA} + \beta_7\textbf{BA} + \beta_8\textbf{exper}\cdot\textbf{black} + \textbf{e}\end{aligned}$$

Interpret the coefficients $\hat{\beta}_4$ and $\hat{\beta}_8$.

Question 3

With this model, test that the return to university education is 7%.

Question 4

With this model, test that the return to junior college education is equal for black and non-black.

Question 5

With this model, test whether the return to university education is equal to the return to 1 year of working experience.

Question 6

Test the overall significance of this regression.

Question 7

Including a square term of working experience to the regression model built above, estimate the linear regression model again. What is the estimated return to work experience in this model?

Question 8

Provide the diagnosis of the homoskedasticity assumption. Does this assumption hold? If so, how does it affect the testing of no effect of university education on salary change? If not, what potential remedies are available?

Table 1: Table caption

	uno	dos
x	$\mathbf{1.997}^{***}$	
	(0.010)	
z		$\mathbf{2.000}^{***}$
		(0.009)
(Intercept)	-0.012	0.011
	(0.010)	(0.009)
R^2	0.998	0.998
R^2_{adj}	0.997	0.998
F	37057	50835
N	100	100

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\cdot}p < 0.1$

Table 2: Table

	Model 1	Model 2
(Intercept)	-0.012	0.011
	(0.010)	(0.009)
x	$\mathbf{1.997}^{***}$	
	(0.010)	
z		$\mathbf{2.000}^{***}$
		(0.009)
R^2	0.998	0.998
Adj. R^2	0.997	0.998
Num. obs.	100	100
RMSE	0.100	0.089

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

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Table 3: test stargzer

	Dependent variable:	
	y1	y2
	(1)	(2)
XX	1.997***	
	(0.010)	
ZZ		2.000***
		(0.009)
Constant	−0.012	0.011
	(0.010)	(0.009)
Observations	100	100
R^2	0.998	0.998
Adjusted R^2	0.997	0.998
Residual Std. Error (df = 98)	0.100	0.089
F Statistic (df = 1; 98)	39,264.070***	50,910.870***
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 4: test stargzer

	Dependent variable:	
	y1	y2
	(1)	(2)
XX	1.997***	
	(0.010)	
ZZ		2.000***
		(0.009)
(Intercept)	−0.012	0.011
	(0.010)	(0.009)
F Statistic	37,057.205***	50,834.839***
df	1; 98	1; 98
Observations	100	100
R^2	0.998	0.998
Adjusted R^2	0.997	0.998
Residual Std. Error	0.100	0.089

·p<0.1; *p<0.05; **p<0.01; ***p<0.001