

# Economics 471: Econometrics

University of Alabama

Department of Economics, Finance and Legal Studies

Fall 2014

Midterm I

The exam consists of three questions on three pages. Each question is of equal value.

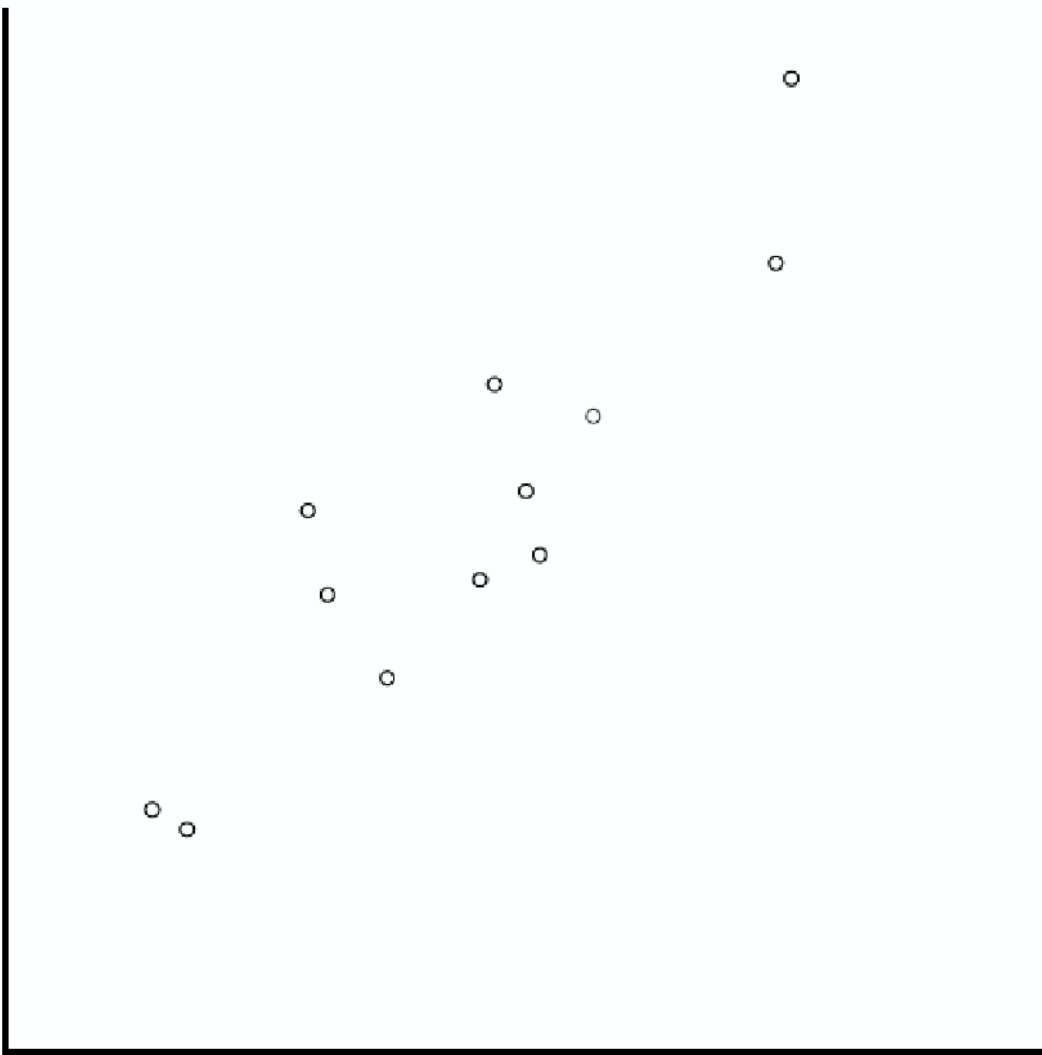
1. Consider the residuals obtained via an OLS regression of  $y$  on  $x$ , i.e.  $y = \phi + \delta x + v$ . Show the following:

(a) 
$$\sum_{i=1}^n \hat{v}_i = 0$$

(b) 
$$\sum_{i=1}^n \hat{v}_i x_i = 0$$

2. Consider the scatter plot below. In the plot, please do the following:

- (a) Label the axes.
- (b) Draw and label the estimated regression line.
- (c) Identify the estimated intercept and slope of the regression line.
- (d) Pick two distinct values of  $x$  and identify the corresponding values for  $y$ .
- (e) For each of the two values of  $x$  chosen in part (d), identify the fitted value and residual.



3. In the course packet we are concerned with the impact of homework on test scores. In the regression below we regress test scores solely on an intercept term. Please use the EViews table below to answer the following questions:

- (a) What is the value of the coefficient  $c(1)$ ?
- (b) What is the intuition for the result in part (a)?
- (c) In this model, what is the impact of an additional hour of homework per week on test scores?
- (d) What is the value of  $R^2$  in this regression?
- (e) What is the intuition for the result in part (d)?

Dependent Variable: TESTSCORES				
Method: Least Squares				
Date: 09/30/11 Time: 11:41				
Sample: 1 3733				
Included observations: 3733				
TESTSCORES = C(1)				
	Coefficient	Std. Error	t-Statistic	Prob.
	C(1)	0.156577	334.8851	0.0000
R-squared		Mean dependent var	52.43538	
Adjusted R-squared		S.D. dependent var	9.566599	
S.E. of regression	9.566599	Akaike info criterion	7.354700	
Sum squared resid	341551.9	Schwarz criterion	7.356368	
Log likelihood	-13726.55	Durbin-Watson stat	1.726481	