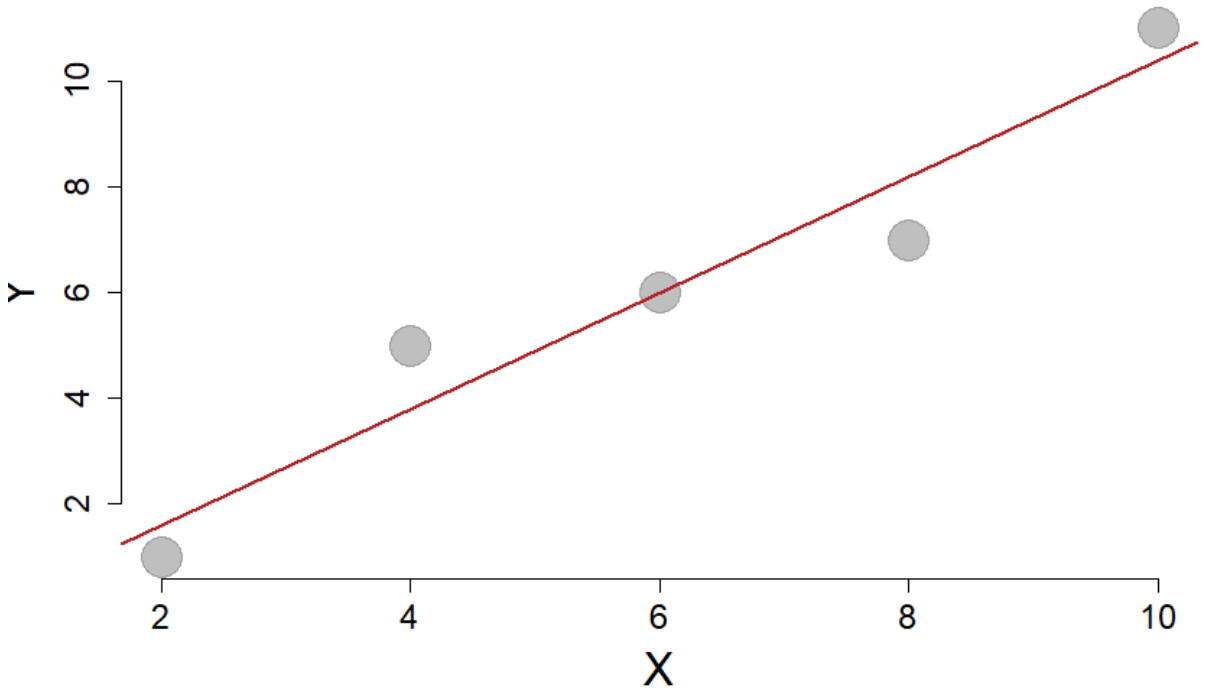
CPP 523: Foundations of Program Evaluation I

Lab #1

Type out your responses (show your work) and submit via Canvas.
Name your file **Lab-##-LastName.doc**.

In this assignment you will be working with a very small data set. You need to build a regression from the ground up. Read pages 9-25 in the Lewis-Beck text, *Applied Regression,* posted on the course website to review basic regression formulas.

I want you to focus on your understanding of the regression error term (often called the "residual"). Can you have an error term without first having a regression line?



X	Y	$\hat{Y}$	e	e^2
2	1			
4	5			
6	6			
8	7			
10	11			
Mean=6	Mean=6	Mean=6	Sum=0	Sum=

Regression model: $Y = b_0 + b_1 X + e$

var(x): 10
var(y): 13
cov(x,y): 11

(1) Calculate b_1 using the knowledge the slope can be calculated as cov(x,y) / var(x).

(2) Interpret the coefficient b_1 in plain English.

(3) Calculate b_0 (recall that $\bar{y} = b_0 + b_1 \bar{x}$)

(4) What is the predicted value of Y when X has a value of 14?

(5) Calculate the sum of the squared errors (see page Lewis-Beck, p14) by completing the table above.

(6) Calculate the regression sum of squares (Lewis-Beck p21). You can check your work for questions 5-6 against the ANOVA table below.

(7) Calculate the R^2 using the sum of squares in the table.

Analysis of Variance Table

	Df	***Sum Sq***	***Mean Sq***	***F value***	***Pr(>F)***
x	*1*	*48.4*	*48.4*	*40.33*	*0.007898*
Residuals	*3*	*3.6*	*1.2*	*NA*	*NA*