

Stat 3323 – Applied Statistics

For a particular variety of plant, researchers wanted to develop a formula for predicting the quantity of seeds as a function of the density of plants. Sixteen plots were used for this research and each of four different densities were randomly assigned to four of the 16 plots. The results of the study are given below.

$X$  = the number of plants per plot (density of plants)

$Y$  = quantity of seeds per plot (in grams)

Plants per plot	Plot number			
	1	2	3	4
10	12.6	11.0	12.1	10.9
20	15.3	16.1	14.9	15.6
30	17.9	18.3	18.6	17.8
40	19.2	19.6	18.9	20.0

Use the sample data to obtain the equation of the best fitting line.

Find and interpret  $R^2$  for the straight-line model.

Check the assumption of linearity with a residual plot and comment.

Fit a more appropriate model and use a residual plot to check the appropriateness of this model. Compare the values of  $R^2$  for the two models.

(You can check your work by looking at the plots on the next page.)

