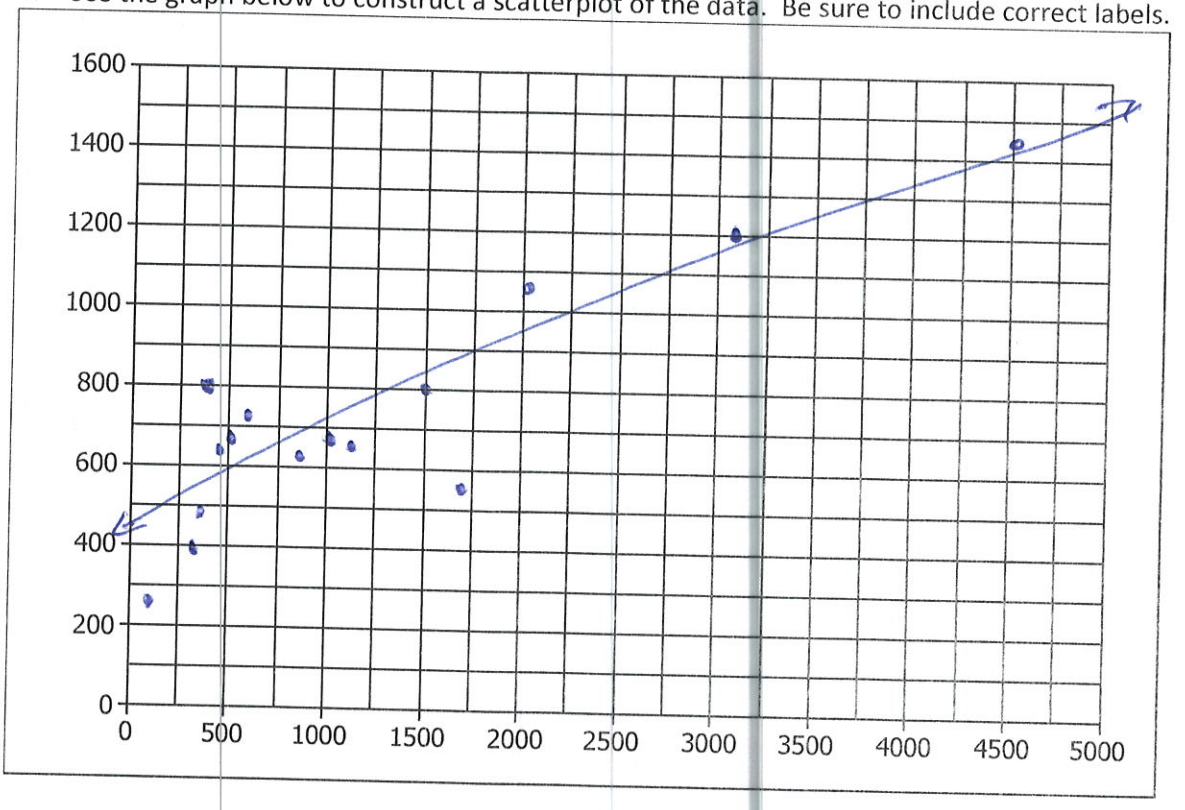
MAT 135, Discussion Questions 2.24

1. Is the price of an airline ticket related to the number of miles traveled? The mileage between Washington, DC and some selected cities is given below along with the average price of an airline ticket from Washington to that city:

Mileage	4500	1000	2000	300	350	500	600	850
Price	1450	690	1050	400	800	670	725	620

Mileage	1700	330	1500	450	100	3100	1100
Price	550	480	800	650	250	1200	650

a. Use the graph below to construct a scatterplot of the data. Be sure to include correct labels.



b. Find the least-squares regression line for the data, i.e. $y = b_0 + b_1 x$, find both b_0 and b_1 and create an **equation** using these values.

LinReg
$y = ax + b$
$a = .223676\ldots$
$b = 458.255\ldots$
$r^2 = .78\ldots$
$r = .884\ldots$

$y = 458.26 + .224x$

c. What is the correlation coefficient for this data? Do you think the line is a good fit? Why or why not? Does your correlation value agree with your visual impression?

r=.884
yes. this is a pretty decent fit
yes it agrees w/ the visualization

d. When should a regression model be used to make a prediction? When should it not be used to make a prediction?

do not use outside (or esp. far outside) the range of the original data. we do not know if trend continues.

Can be used within the range of the original data

2. Be prepared to discuss the article at http://pareonline.net/getvn.asp?v=8&n=2. The main points the article makes apply to simple one-variable regression problems, too. What are those main points?

includes 1) linearity assumption 2) normality assumption 3)

3. What is the coefficient of determination and what does it mean?

r^2 gives the proportion of change in y explained by relationship w/ x.

4. How can we easily create a residual graph in our calculators?

Store regression equation in Y_1. Then
$Y_1(L_1) \rightarrow L_3$; then graph L_1 vs. L_4
(Store) then $L_2 - L_3 \rightarrow L_4$ (Store)