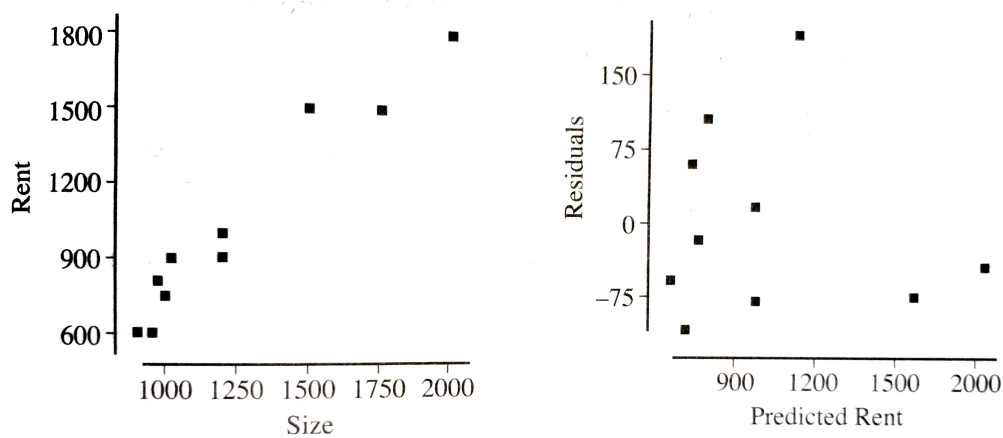# Assignment 7

1. A simple random sample (SRS) of condo listings yield the following computer output:
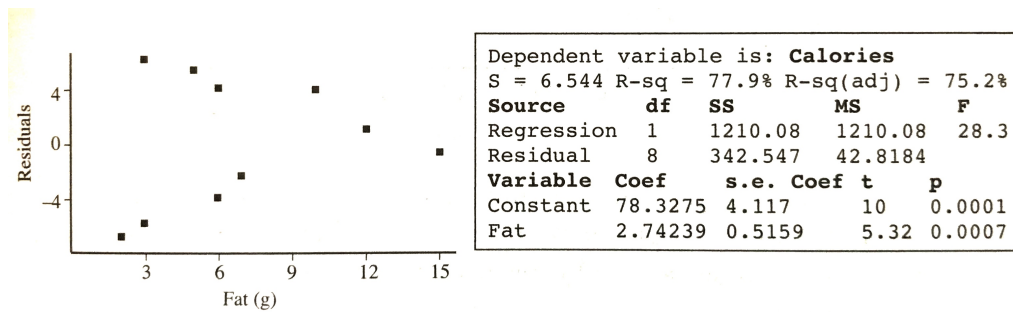

Variable	Coef	s.e. Coef	t	p
Constant	−311.341	117.6	−2.65	0.0294
Size	1.07707	0.09047	11.9	0.0001
s = 102.4	R-squ = 94.7%	R-squ(adj) = 94.0%		

(a) Is a linear model appropriate for these data? Explain

(b) Interpret the slope of the regression line

(c) Interpret r^2 in context

2. The calories and fat content per serving size of 10 brands of potato chips are fitted with a least squares regression line with computer output:
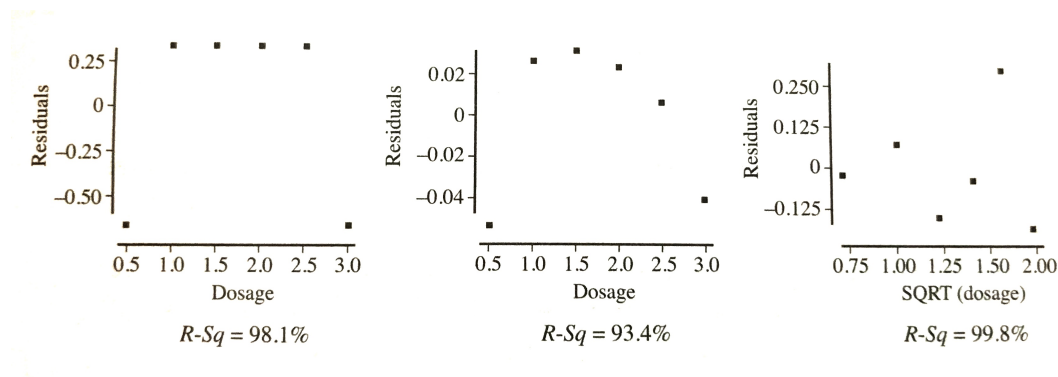


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Dependent variable is: Calories
S = 6.544 R-sq = 77.9% R-sq(adj) = 75.2%
Source        df    SS        MS        F
Regression    1     1210.08   1210.08   28.3
Residual      8     342.547   42.8184
Variable  Coef       s.e. Coef  t     p
Constant  78.3275  4.117      10    0.0001
Fat       2.74239  0.5159     5.32  0.0007
```

(a) Is a line an appropriate model? Explain.

(b) Interpret the slope of the regression line in context

(c) Interpret the y-intercept of the regression line in context.

(d) What are the predicted calories for a brand with 10g of fat per serving?

(e) What are the actual calories for the brand with 10g of fat per serving?

3. The table below gives the weight loss (in pounds) during the first month for 6 overweight patients on varying dosages of an experimental drug.

Dosage (grams), x	0.5	1.0	1.5	2.0	2.5	3.0
Weight Loss (pounds), y	7	10	12	14	16	17

Linear regression lines on (x, y), on the transformed data $(x, \log(y))$, and on the transformed data $(\sqrt{x}, y)$ result in the following computer output:

R-Sq = 98.1%   R-Sq = 93.4%   R-Sq = 99.8%

(a) Interpret the coefficient of determination for the transformed data $(\sqrt{x}, y)$.

(b) Compare the thee regression lines as to goodness-of-fit for a linear model.

4. Below are the scores of a school's AP Statistics students on a practice 40 question multiple choice exam:

$$33, 31, 37, 39, 27, 31, 40, 36, 27, 27$$

$$27, 30, 34, 38, 27, 29, 27, 38, 37, 40$$

$$33, 36, 29, 26, 34, 32, 39, 32, 39, 36$$

$$32, 32, 25, 31, 26, 40, 33, 37, 29, 26$$

$$35, 26, 37, 33, 27, 28, 32, 37, 33, 32$$

(a) Using the following line from the random number table, explain and carry out a simple random sample of size 10 from the population above.

$$77219 \ 48190 \ 20235 \ 26836 \ 23590$$

$$44492 \ 14607 \ 09431 \ 75299 \ 42662$$

(b) Using this sample, and assuming all conditions for inference have been met, construct a 90 percent confidence interval for the population mean μ.

(c) The true population mean is 32.44. Is it in your interval, and is this unexpected?