

1. A typical residential house was selected by local power company to develop an empirical model for energy consumption (in kilowatts per day) as a function of average daily temperature during the winter months. For fifteen days the following information was obtained.

Temperature (Celsius)	0	8	7.5	13.5	14	8.5	4.5	-11
Energy usage	70	57	60	63	57	66	67	107
Temperature (continued)	-7.5	-8.5	1.5	0.5	2	-6	-4	
Energy usage (continued)	96	88	80	64	79	82	97	

- a. Graph the data. Is a linear association suggested?
- b. Set up a simple linear model and estimate the parameters associated with the model and plot the regression line on the graph in a.
- c. Estimate whether LS coefficients are significantly different from zero.
- d. Compute residuals and plot residuals against predicted response in a scatter plot. Are the residuals uncorrelated?
- e. Compute sample correlation coefficient and coefficient of determination and explain these statistics.