

Intro to Stats: Homework 10.1-3, Day 2

Please do your work and show your answers on other paper.

1. The data to the right compares the height of an eruption and the time interval (until the next eruption) for the geyser Old Faithful.

- Find the correlation coefficient
- Test the correlation coefficient for significance
- Find the best-fitting line.
- Use the best-fitting line to predict the time interval that follows an eruption height of 100 feet.

For your convenience: $\bar{X} = 128.75$, $\bar{Y} = 86$,
 $S_{XX} = 1247.50$, $S_{YY} = 1036.00$, $S_{XY} = 305.00$

Height (X)	Interval after (Y)
140	92
110	65
125	72
120	94
140	83
120	94
125	101
150	87

2. The data to the right lists the number of murders and the population sizes (in hundreds of thousands) for several large cities in the US during a recent year.

- Find the correlation coefficient
- Test the correlation coefficient for significance
- Find the best-fitting line.
- Boston has a population of about 630,000 people. Use the best-fitting line to predict the number of murders in Boston.

For your convenience: $\bar{X} = 19.7$, $\bar{Y} = 344$,
 $S_{XX} = 5404.18$, $S_{YY} = 420,298.00$, $S_{XY} = 34,671.00$

Population (X)	Murders (Y)
4	258
6	264
9	402
6	253
3	111
29	648
15	288
38	654
20	256
6	60
81	590

3. Suppose we turn that data in Problem 2 around, and think of the murders as X and the population as Y. The correlation coefficient will not change, but the best-fitting line will. In particular, S_{XX} and S_{YY} will swap, and \bar{X} and \bar{Y} will swap. Under this change:

- Find the best-fitting line.
- Predict the size of a city that has 120 murders.