

“Pencil and Paper” Statistics

Look at the following list of 100 “observations”, sorted in ascending order:

3.04775	4.52319	4.88689	5.30194	5.50166	5.95434	6.23758	6.73377	7.16939	7.68143
3.53809	4.54121	5.00959	5.32012	5.51673	5.96450	6.31609	6.74718	7.18998	7.72217
3.74020	4.57756	5.04687	5.32903	5.51746	5.96916	6.31616	6.80340	7.20643	7.83092
3.85742	4.65375	5.05386	5.37263	5.53880	6.08443	6.34545	6.80912	7.21458	8.15903
3.85808	4.66513	5.09026	5.38527	5.55402	6.08539	6.37747	6.84059	7.28452	8.19383
3.88894	4.69771	5.12805	5.42368	5.57122	6.10093	6.40947	6.84108	7.35917	8.24531
4.04865	4.75459	5.14843	5.43435	5.70474	6.17425	6.47918	6.91491	7.43289	8.28399
4.29119	4.86136	5.15155	5.46089	5.70991	6.17444	6.51614	7.02893	7.48936	8.35443
4.35003	4.87061	5.21041	5.46621	5.74216	6.21993	6.62334	7.09863	7.56091	8.63916
4.48541	4.88285	5.23623	5.47586	5.85408	6.23013	6.67173	7.12082	7.59353	9.17313

To answer the following questions, **don’t bother typing the numbers in**. You can use a simple calculator and use the following information (in addition to what follows automatically by the list being sorted):

- ∞ Count of observations: 100
- ∞ Sum of observations: 597.2493
- ∞ Sum of squares of observations: 3723.0503

Note: don’t bother keeping all decimal digits in your answers (although you may keep them in your intermediate calculations): three significant digits (as in 1.23) are more than enough.

Reminder: You don’t need to write an extensive description of your calculations, but **do explain what you did in answering each question**

Week 5

Review of Descriptive Statistics:

1. What are the first, second (median) , and third quartiles?
2. What are the mean, the “population”, and the “sample” variance?
3. Would you say that the extreme (highest/lowest) values are abnormally high/low? There are several rules of thumb that people use, all of them predicated on the assumption that the sampled distribution is normal or approximately so. You may use any that you happened to find, or you can decide that any data falling outside the range “average - 3*standard deviation, average + 3*standard deviation” is “abnormal”.

Interval Estimate

1. Find confidence intervals for the mean, assuming these come from a normal distribution, at 90%, 95%, and 99% confidence level
2. *Extra Credit (especially for 211 students): find confidence intervals for the variance*

Week 6 (Testing - significance)

1. Set up a two-tailed test for the mean, with Null Hypothesis $\mu = 6$. Is the test significant or not, at the usual levels?
2. What is the p -value of your test?

Week 7 (Testing - power)

1. Referring to last week's test, write the power functions for a few values of μ
2. Determine values for μ , such that the Type II Error is no more than 10%