

Worksheet 7: Statistics

1. What two statistical measures do we want, at the very least, to begin understanding a data set?
2. Why are the two measures from the question above important?
3. What is the difference between a statistic and a parameter, and how can you tell the difference for the measures discussed above?
4. According to the United States Census Bureau, the average income for a group of 219,830 people 25 or older in 2017 was \$58,004 with a standard deviation of \$353. Using this information, calculate
 - (a) The standard deviation of the mean (σ_n)
 - (b) The z-score of a person who made \$65,000 that year
5. Conduct an F test to determine whether or not the 2016 Current Population Survey data, with a standard deviation of \$331, came from the same population. Make sure to identify your null hypothesis and your confidence level.
6. The ratio of the number of atoms of the isotopes ^{69}Ga and ^{71}Ga in eight samples from different sources was measured in an effort to understand differences in reported values of the atomic mass of gallium. Using the data found in the table below and Excel or a similar statistics software, calculate:
 - (a) The mean
 - (b) The standard deviation
 - (c) The variance
 - (d) The standard deviation of the mean

| Sample | $^{69}\text{Ga}/^{71}\text{Ga}$ |
|--------|---------------------------------|
| 1 | 1.52660 |
| 2 | 1.52974 |
| 3 | 1.52592 |
| 4 | 1.52731 |
| 5 | 1.52894 |
| 6 | 1.52804 |
| 7 | 1.52685 |
| 8 | 1.52793 |

7. For the problem above, write the mean and standard deviation together with an appropriate number of significant digits.

8. Using the mean isotope ratio you calculated above, estimate the atomic mass of gallium.