MTH 372 (Winter 2025) : Tutorial IX

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1. The table below lists the numbers of games played in the baseball World Series as of this writing. That table also includes the expected proportions for the numbers of games in a World Series, assuming that in each series, both teams have about the same chance of winning. Use a 0.05 significance level to test the claim that the actual numbers of games fit the distribution indicated by the expected proportions.

Games played	Actual World Series contest	Expected proprotion
4	19	2/16
5	21	4/16
6	22	5/16
7	37	5/16

2. The table below consists of a contingency table with a row variable (whether Kristen Gilbert was on duty) and a column variable (whether the shift included a death). Test the claim that whether Gilbert was on duty for a shift is independent of whether a patient died during the shift. Use a significance level of 0.01. What does the result suggest about the charge that Gilbert killed patients.

	Shift with a death	Shift without a death
Gilbert was working	40	217
Gilbert was not working	34	1350

3. We want to know if the proportion of subjects in each group who experience abdominal pain is different at 1% significance level.

Drug that reduces LDC (bad cholesterol)

	Group 1	Group 2	Group 3
Number of people who experience abdominal pain	51	5	16
Number of people who did not experience abdominal pain	1532	152	163

4. A common claim is that garlic lowers cholesterol levels. In a test of the effectiveness of garlic, 49 subjects were treated with doses of raw garlic, and their cholesterol levels were measured before and after the treatment. The changes in their levels of LDL cholesterol (in mg>dL) have a mean of 0.4 and a standard deviation of 21.0 (based on data from "Effect of Raw Garlic vs Commercial Garlic Supplements on Plasma Lipid Concentrations in Adults With Moderate Hypercholesterolemia," by

Gardner et al., Archives of Internal Medicine, Vol. 167). Use the sample statistics of n = 49, $\bar{x} = 0.4$, and s = 21.0 to construct a 95% confidence interval estimate of the mean net change in LDL cholesterol after the garlic treatment. What does the confidence interval suggest about the effectiveness of garlic in reducing LDL cholesterol?

5. Confidence Interval for Alcohol in Video Games Twelve different video games showing substance use were observed. The duration times (in seconds) of alcohol use were recorded, with the times listed below (based on data from ?Content and Ratings of Teen-Rated Video Games,? by Haninger and Thompson, Journal of the American Medical Association, Vol. 291, No. 7). The de- sign of the study justifies the assumption that the sample can be treated as a simple random sample. Use the sample data to construct a 95% confidence interval estimate of m, the mean duration time that the video showed the use of alcohol.
   84 14 583 50 0 57 207 43 178 0 2 57

6. The proper operation of typical home appliances requires voltage levels that do not vary much. Listed below are ten voltage levels (in volts) recorded in the author?s home on ten different days. (The voltages are from Data Set 13 in Appendix B.) These ten values have a standard deviation of s = 0.15 volt. Use the sample data to construct a 95% confidence interval estimate of the standard deviation of all voltage levels.
   123.3 123.5 123.7 123.4 123.6 123.5 123.5 123.4 123.6 123.8

7. A simple random sample of 40 salaries of NCAA football coaches has a mean of \$415,953. Assume that s = \$463,364. Construct a 95% confidence interval estimate of the mean salary of an NCAA football coach.