# LAB SESSION 6 – HYPOTHESIS TESTING

Analytics Primer

# CUSTOMER SERVICE CALLS

# Example

- The customer service call center for a company decided that clients should not be put on hold for more than 2 minutes. Recently a manager was concerned about clients being put on hold for too long. The manager calculated from a sample of 81 calls a sample average wait time on hold as 2.4 minutes with a standard deviation of 1.2 minutes. Conduct a hypothesis test with a significance level of 0.05.

$$H_0: \mu \leq 2, H_A: \mu > 2$$

$$t = \frac{2.4 - 2}{\frac{1.2}{\sqrt{81}}} = 3 \rightarrow (0.001, 0.005) \text{ or } 0.0018 < 0.05 \rightarrow \text{REJECT } H_0$$

# UNIVERSITY GRADES

# Example

- A university program would like to claim that only 10% of students taking their courses get a failing grade (F). If too many students fail, the program is worried that the university will want to change the structure of the courses. If too few a students fail, the program is worried that students will see their classes as too easy and not work as hard. The program sampled 251 students who took one of their courses over the past year and 19 of them had failed. Conduct the hypothesis test. Be sure to show all steps.

$$H_0: p = 0.1, H_A: p \neq 0.1$$

$$z = \frac{0.076 - 0.1}{\frac{\sqrt{0.1 \times (1 - 0.1)}}{251}} = -1.32 \rightarrow 0.0934 \times 2 = 0.1868 > 0.05 \rightarrow$$

DO NOT REJECT $H_0$

# HOMELESS POPULATION

# Example

- A researcher found in a publication that a 95% confidence interval for the percent of homeless individuals in a certain town was between 3% and 8% (let's assume he/she trusts this source). The researcher wants to use this information to decide if the percent of homeless individuals in this town was significantly different than 2% using a level of significance of 0.05. What could he/she conclude? Explain.

Since 2% was not in the confidence interval,
we can conclude that the homeless proportion
is statistically larger than 2% (at a sig level of 0.05).