# Part 2 Test Statistics, Critical Values, and P-values for two samples

### I. Quantitative Variables

### a. 1 Sample mean t-test:

Requirements to make inference:

**Test Statistic:** 

b. Matched pair t-test

Requirements to make inference

Test statistic:

### c. 2 sample means t-test

Requirements to make inference

Test statisitic

## II. Categorical Variables

# a. 1 sample proportion z-test Requirements to make inference

**Test Statistic** 

### b. 2 sample proportion z-test

Requirements to make inference

**Test Statistic** 

## Interpreting the p-value

# Example: Cell Phone Data Set

# Variables (label as Q for quantitative or C as categorical)

Math - SAT math Score

Verbal – Verbal SAT Scores

Credits – Number of credits the student is registered for

Year - Year in College (1=Freshman, 2=Sophmore)

Exer - Time spent exercising

Sleep – Time in Hours spent sleeping

Veg – Are you a vegetarian (yes, no, some)

<u>Question 1</u>: The mean verbal SAT score of all the students in this university is 580. Is this also the case for all stat students at this university?

<u>Question 2</u>: Based on a recent study, roughly 80% of college students in the U.S. own a cell phone. Do the data provide evidence that the proportion of students who own cell phones in this university is lower than the national figure? **Question 3:** Most students who grew up speaking primarily English do better on the verbal portion of the SAT. Do the data provide evidence that students at this university do better on the Verbal portion of the SAT test?

**Question 4:** Write a question that a hypothesis test can analyze using two population's means. Run the analysis.

**Question 5:** Write a question that a hypothesis test can analyze using two sample populations proportions. Run the analysis.