

Name: \_\_\_\_\_

Course & Section: \_\_\_\_\_

*Electronic copies of this homework are located in D2L.*

## 2 Sample T-test

### Part 1

Watch the Video: [2 SampleMeansPart01](https://www.youtube.com/watch?v=48stLbhSgqU&feature=youtu.be) (<https://www.youtube.com/watch?v=48stLbhSgqU&feature=youtu.be>)

1. Which of the following could be the null hypothesis for 2-sample t-test?
  - a.  $H_0: \mu_1 = \mu_2$
  - b.  $H_0: \mu = 0$
  - c.  $H_0: \mu_1 \neq \mu_2$
  - d.  $H_0: \mu_1 - \mu_2 = 0$
  - e.  $H_0: \mu_1 < \mu_2$

### Part 2

Watch the Video: [2 SampleMeansPart02](https://www.youtube.com/watch?v=9dSITyksmPw&feature=youtu.be) (<https://www.youtube.com/watch?v=9dSITyksmPw&feature=youtu.be>)

1. A Type I error is when the investigator incorrectly rejects the null hypothesis.
  - a. True
  - b. False

### Part 3

Watch the Video: [2 SampleMeansPart03](https://www.youtube.com/watch?v=MKedZQvkox4&feature=youtu.be) (<https://www.youtube.com/watch?v=MKedZQvkox4&feature=youtu.be>)

1. If the test statistic is in the critical region, reject  $H_0$ .
  - a. True
  - b. False

### Part 4

Watch the Video: [2 SampleMeansPart04](https://www.youtube.com/watch?v=0PP35A4XaSA&feature=youtu.be) (<https://www.youtube.com/watch?v=0PP35A4XaSA&feature=youtu.be>)

1. The investigator believes that employees at Company A typically work fewer hours. What are the corresponding null and alternative hypotheses for differences in the population means?
  - a.  $H_0: \mu_A < \mu_B$ ;  $H_1: \mu_A = \mu_B$
  - b.  $H_0: \mu_A = \mu_B$ ;  $H_1: \mu_A > \mu_B$
  - c.  $H_0: \mu_A = \mu_B$ ;  $H_1: \mu_A < \mu_B$
  - d.  $H_0: \mu_A = \mu_B$ ;  $H_1: \mu_A \neq \mu_B$

## Part 5

Watch the Video: [2 Sample Means Classical Removed Part 05](https://www.youtube.com/watch?v=0PP35A4XaSA&feature=youtu.be)

(<https://www.youtube.com/watch?v=0PP35A4XaSA&feature=youtu.be>)

1. What is your conclusion for the hypotheses test?
  - a. Reject  $H_0$ . The test statistic is less than the critical value and lies in the critical region.
  - b. Fail to reject  $H_0$ . The test statistic is less than the critical value and lies in the critical region.
  - c. Reject  $H_0$ . The test statistic is greater than the critical value and does not lie in the critical region.
  - d. Fail to reject  $H_0$ . The test statistic is greater than the critical value and does not lie in the critical region.
  
2. Explain how you used the p-value to make your decision reject  $H_0$  or not to.
  - a. The p-value was less than alpha so I did not reject the null.
  - b. The p-value was less than alpha so I did reject the null.
  - c. The p-value was not less than alpha so I did not reject the null.
  - d. The p-value was not less than alpha so I did reject the null.
  
3. Is there a significant difference in the population mean number of hours worked between Company A and Company B? Write one-sentence reporting your conclusion.
  - a. Yes, the true population mean number of hours worked by company A and B is not significantly different at the 5% level.
  - b. No, the true population mean number of hours worked by company A and B is significantly different at the 5% level.