**Week 5 : Hypothesis Testing II: One Sample Hypothesis Tests - Checkpoint**

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| **1**. Recall that “very satisfied” customers give the XYZ-Box video game system a rating that is at least 42. Suppose that the manufacturer of the XYZ-Box wishes to use the random sample of 65 satisfaction ratings to provide evidence supporting the claim that the mean composite satisfaction rating for the XYZ-Box exceeds 42. |

* **a:** Letting *μ* represent the mean composite satisfaction rating for the XYZ-Box, set up the null hypothesis *H*0 and the alternative hypothesis *Ha* needed if we wish to attempt to provide evidence supporting the claim that *μ* exceeds 42.
* **b:** The random sample of 65 satisfaction ratings yields a sample mean of http://online.vitalsource.com/books/0077587456/content/math_img/60999199053F6F939F11B0F0D4CF968466E3EEE3BF8C702921713FADAB4CA09C?c=20963462= 42.954. Assuming that s equals 2.64, use critical values to test *H*0 versus *Ha* at each of *α* = .10, .05, .01, and .001.
* **c:** Using the information in part b, calculate the *p*-value and use it to test *H*0 versus *Ha* at each of *α* = .10, .05, .01, and .001. **d** How much evidence is there that the mean composite satisfaction rating exceeds 42?

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| **2.** Complete Exercise 9.19 on page 358 in your textbook. (Points : 7) The Crown Bottling Company has just installed a new bottling process that will fill 16-ounce bottles of the popular Crown Classic Cola soft drink. Both overfilling and underfilling bottles are undesirable: Underfilling leads to customer complaints and overfilling costs the company considerable money. In order to verify that the filler is set up correctly, the company wishes to see whether the mean bottle fill, *μ*, is close to the target fill of 16 ounces. To this end, a random sample of 36 filled bottles is selected from the output of a test filler run. If the sample results cast a substantial amount of doubt on the hypothesis that the mean bottle fill is the desired 16 ounces, then the filler’s initial setup will be readjusted.* **a:** The bottling company wants to set up a hypothesis test so that the filler will be readjusted if the null hypothesis is rejected. Set up the null and alternative hypotheses for this hypothesis test.
* **b:** Suppose that Crown Bottling Company decides to use a level of significance of *α* = .01, and suppose a random sample of 36 bottle fills is obtained from a test run of the filler. For each of the following four sample means− http://online.vitalsource.com/books/0077587456/content/math_img/50AC6FED72C2D3B355FF20A6886E6A21E4FFBAC2D4E071683E136650944EE7D2?c=20963462, http://online.vitalsource.com/books/0077587456/content/math_img/00F1751B18DC9E33955796DA3296685B99BAE5568A361A0FFDC81137847F84D8?c=20963462, http://online.vitalsource.com/books/0077587456/content/math_img/B9639B162FF06AB63BA467CA84BF8CCA4B2A4125F6EC5A2DE6520688291C2AAF?c=20963462, and http://online.vitalsource.com/books/0077587456/content/math_img/486D65CFC0CF07FA31E77AE68CC35035EA9F9C645805C1503FA7814348D42FA9?c=20963462−determine whether the filler’s initial setup should be readjusted. In each case, use a critical value, a *p*-value, and a confidence interval. Assume that s equals .1.
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| **3.** Complete Exercise 9.29 (The Video Game Satisfaction Rating Case) on page 362 in your textbook. (Points : 7) Recall that “very satisfied” customers give the XYZ-Box video game system a composite satisfaction rating that is at least 42.* **a:** Letting *μ* represent the mean composite satisfaction rating for the XYZ-Box, set up the null and alternative hypotheses needed if we wish to attempt to provide evidence supporting the claim that *μ* exceeds 42.

The mean and the standard deviation of a sample of *n* = 65 customer satisfaction ratings are http://online.vitalsource.com/books/0077587456/content/math_img/E2EDC8C095791D7A3E7C328E39890C5AB9B4BC13EDEFB5909053FAAC588626A0?c=20963462and *s* = 2.6424. Use a critical value to test the hypotheses you set up in part *α* by setting *α* equal to .01. Also, interpret the *p*-value of .0025 for the test. |

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| **4.** Complete Exercise 9.31 on page 362 in your textbook. (Points : 7) Consider a chemical company that wishes to determine whether a new catalyst, catalyst XA-100, changes the mean hourly yield of its chemical process from the historical process mean of 750 pounds per hour. When five trial runs are made using the new catalyst, the following yields (in pounds per hour) are recorded: 801, 814, 784, 836, and 820. http://online.vitalsource.com/books/0077587456/content/image/E87456_com_f0010.jpgChemYieldhttp://online.vitalsource.com/books/0077587456/content/image/E87456_09_t0004.jpg* **a:** Letting *μ* be the mean of all possible yields using the new catalyst, set up the null and alternative hypotheses needed if we wish to attempt to provide evidence that *μ* differs from 750 pounds.
* **b:** The mean and the standard deviation of the sample of 5 catalyst yields are http://online.vitalsource.com/books/0077587456/content/math_img/F113DF02EE3BE74D162FCBC8C47D9AA50E89B8EC584036ED796FD12116DBDDBC?c=20963462and *s* = 19.647. Using a critical value and assuming approximate normality, test the hypotheses you set up in part *α* by setting *α* equal to .01. The *p*-value for the hypothesis test is given in the Excel output on the page margin. Interpret this *p*-value.
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| **5.** Complete Exercise 9.42 on page 367 in your textbook. (Points : 7)  |

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The manufacturer of the ColorSmart-5000 television set claims that 95 percent of its sets last at least five years without needing a single repair. In order to test this claim, a consumer group randomly selects 400 consumers who have owned a ColorSmart-5000 television set for five years. Of these 400 consumers, 316 say that their ColorSmart-5000 television sets did not need repair, while 84 say that their ColorSmart-5000 television sets did need at least one repair.

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