**Week 4 : Hypothesis Testing I: Basics and Confidence Intervals - Checkpoint**

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| **1.** An environmental group at a local college is conducting independent tests to determine the distance a particular make of automobile will travel while consuming only 1 gallon of gas. A sample of five cars is tested and a mean of 28.2 miles is obtained. Assuming that the standard deviation is 2.7 miles, find the 95% confidence interval for the mean distance traveled by all such cars using 1 gallon of gas. (Points : 4)        [26.16 30.24]       [20.70 35.70]       [24.85 31.55]       [26.70 29.70]       [25.83 30.57] |

**2.** A random sample of size 30 from a normal population yields   = 32.8 with a population standard deviation of 4.51. Construct a 95 percent confidence interval for image002.gif . (Points : 4)        [23.96 41.64]       [32.04 33.56]       [31.45 34.15]       [31.19 34.41]

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| **3.** In a manufacturing process a random sample of 36 bolts manufactured has a mean length of 3 inches with a standard deviation of .3 inches. What is the 99% confidence interval for the true mean length of the bolt? (Points : 4)        2.902 to 3.098       2.884 to 3.117       2.865 to 3.136       2.228 to 3.772       2.465 to 3.205 |

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| **4.** A federal bank examiner is interested in estimating the mean outstanding defaulted loans balance of all defaulted loans over the last three years. A random sample of 20 defaulted loans yielded a mean of $67,918 with a standard deviation of $16,552.40. Calculate a 90% confidence interval for the mean balance of defaulted loans over the past three years. (Points : 4)        [66,487 69,349]       [39,299 96,537]       [57,329 78,507]       [61,829 74,007]       [61,519 74,317]  |

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| **5.** Unoccupied seats on flights cause airlines to lose revenue. Suppose a large airline wants to estimate its average number of unoccupied seats per flight over the past year. 225 flight records are randomly selected and the number of unoccupied seats is noted with a sample mean of 11.6 seats and a standard deviation of 4.1 seats. How many flights should we select if we wish to estimate  to within 2 seats and be 95% confident? (Points : 4)        130       65       33       17       12 |

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| **6.** The coffee/soup machine at the local bus station is supposed to fill cups with 6 ounces of soup. Ten cups of soup are brought with results of a mean of 5.93 ounces and a standard deviation of 0.13 ounces. How large a sample of soups would we need to be 95% confident that the sample mean is within 0.03 ounces of the population mean? (Points : 3)        97       96       73       62       10 |
| **7.** Recently, a case of food poisoning was traced to a particular restaurant chain. The source was identified and corrective actions were taken to make sure that the food poisoning would not reoccur. Despite the response from the restaurant chain, many consumers refused to visit the restaurant for some time after the event. A survey was conducted three months after the food poisoning occurred with a sample of 319 patrons contacted. Of the 319 contacted, 29 indicated that they would not go back to the restaurant because of the potential for food poisoning Construct a 95% confidence interval for the true proportion of the market who still refuse to visit any of the restaurants in the chain three months after the event. (Points : 3)        [.059 .122]       [.090 .091]       [.000 .196]       [.240 .339]       [.118 .244] |

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| **8.** The Ohio Department of Agriculture tested 203 fuel samples across the state in 1999 for accuracy of the reported octane level. For premium grade, 14 out of 105 samples failed (they didn't meet ASTM specification and the FTC Octane posting rule). Find a 99% confidence interval for the true population proportion of premium grade fuel-quality failures. (Points : 3)        [.045 .221]       [.068 .198]       [.023 .115]       [.048 .219]       [.100 .276] |

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| **9.** Recently, a case of food poisoning was traced to a particular restaurant chain. The source was identified and corrective actions were taken to make sure that the food poisoning would not reoccur. Despite the response from the restaurant chain, many consumers refused to visit the restaurant for some time after the event. A survey was conducted three months after the food poisoning occurred with a sample of 319 patrons contacted. Of the 319 contacted, 29 indicated that they would not go back to the restaurant because of the potential for food poisoning. What sample size would be needed in order to be 99% confident that the sample proportion is within .02 of , the true proportion of customers who refuse to go back to the restaurant? (Points : 3)        14       38       129       1,371       1,777 |
| **10.** The Ohio Department of Agriculture tested 203 fuel samples across the state in 1999 for accuracy of the reported octane level. For premium grade, 14 out of 105 samples failed (they didn't meet ASTM specification and the FTC Octane posting rule). How many samples would be needed to create a 99% confidence interval that is within 0.02 of the true proportion of premium grade fuel-quality failures? (Points : 3)        4148       2838       1913       744       54 |

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