A skinflint cereal magnate wants to make sure that the cereal box filling machines are not filling boxes with more cereal than is advertised on the box. He doesn’t care if the weight is less than printed, just not more. He has a 144 boxes randomly pulled from the line and the weights of the contents tested. If the average weight of the sample is significantly greater at the 5% level, he will stop production and have the machines adjusted.

The boxes advertise 18 oz of cereal. His sample average was 18.24 oz with a sample standard deviation of 1.2 oz

Conduct a test at the 5% level. Do we stop production?

1. Give a description of the population parameter.
2. State the null hypotheses
   1. Null Hypothesis:
   2. Alternative hypothesis:
3. Check the [two] technical conditions:
4. Calculate the appropriate test statistic (z or t):
5. Calculate the p-value:
6. Summarize (reject? Or not):

Generate a 90% Confidence interval for the population parameter:

The cereal magnate’s son, who the father called a “tree-hugging snag,[[1]](#footnote-1)” upon taking over operations was appalled to hear the company may be cheating customers by selling them less cereal than was printed on the box. He doesn’t care if the weight is *more* than printed, just not *less*. He has 28 boxes randomly pulled from the line and the weights of the contents tested. If the average weight of the sample is significantly less at the 5% level, he will stop production and have the machines adjusted.

The boxes advertise 18 oz of cereal. His sample average was 17.6 oz. Use the same sample standard deviation of 1.2 oz.

Conduct a test at the 5% level. Do we stop production?

1. Give a description of the population parameter.
2. State the null hypotheses
   1. Null Hypothesis:
   2. Alternative hypothesis:
3. Check the [two] technical conditions:
4. Calculate the appropriate test statistic (z or t):
5. Calculate the p-value:
6. Summarize (reject? Or not):

Generate a 90% Confidence interval for the population parameter:

Professor Creel purchases a bag of filberts that states on the package, “*no more than 10%* shriveled and bitter.” After eating 40 filberts, he encounters 8, or 20%, that are shriveled, bitter, and completely inedible. Should he drive through the blowing snow to Price Chopper to return the (uneaten) filberts get back his hard-earned $3.56. Do a test at the 1% level (.01 level) to be safe. (Price Chopper won’t accept returns based on the weaker 10% or .1 level tests).

1. Give a description of the population parameter.
2. State the null hypotheses
   1. Null Hypothesis:
   2. Alternative hypothesis:
3. Check the [two] technical conditions:
4. Calculate the appropriate test statistic (z or t):
5. Calculate the p-value:
6. Summarize (reject? Or not):

If the test is not rejected at the 99% level, at what level would it be rejected?

Generate a 98% Confidence interval for the population parameter:

Professor Creel purchases a 24 oz bag of Tropical Extravaganza mixed nuts that states on the package, “*no less* than 40% almonds .” After his experience with the filberts, he obsessively separates and weighs each type of nut in the bag, and finds 4 oz cashews, 5 oz brazil nuts, 6 oz macadamia nuts, and 9 oz of almonds (ie 9 oz of almonds and 15 oz of other nuts). Back to Price Chopper? Do a test at the 1% level.

1. Give a description of the population parameter.
2. State the null hypotheses
   1. Null Hypothesis:
   2. Alternative hypothesis:
3. Check the [two] technical conditions:
4. Calculate the appropriate test statistic (z or t):
5. Calculate the p-value:
6. Summarize (reject? Or not):

Generate a 98% Confidence interval for the population parameter:

1. Sensitive New Age Guy [↑](#footnote-ref-1)