Use the M&M Candies data set from the Data Hoard found at

http://stat.pugetsound.edu/hoard/datasetDetails.aspx?id=1

for this assignment. As always, be sure to read the description of the data set. For this particular assignment, make sure that you use only the peanut M&Ms, not the entire data set.

It isn’t clear what population the bag of M&Ms in the data set might be considered to be drawn approximately at random from, so we will just refer to it as the “peanut M&Ms population” in this problem.

Let \( \lambda \) be the true, unknown proportion of orange M&Ms in the peanut M&Ms population. This is the same as the probability of drawing an orange M&M when you draw at random from the peanut M&Ms population. Use your sample to compute a point estimate and a 95% confidence interval for \( \lambda \).

Let \( L \) be the random variable whose value is the proportion of orange M&Ms in a simple random sample of size 153 drawn from the peanut M&Ms population. As usual, we use \( L \) as an estimator of \( \lambda \).

1. What is the value of the point estimate of \( \lambda \) obtained from \( L \) with this sample?
2. What is the standard error of \( L \) used in computing a 95% confidence interval for \( \lambda \)?
3. What is the central 0.95 quantile for a standard normal distribution?
4. What is a 95% confidence interval for \( \lambda \)?

5. According to some information you have read, the proportion of orange peanut M&Ms among all peanut M&Ms in the world was supposedly 0.12 during the summer of 2008. You will now conduct a hypothesis test with

\[
H_0 : \lambda = 0.12 \quad \text{and} \quad H_a : \lambda \neq 0.12.
\]

As usual, use a significance level of 0.05.

What is the standard error of \( L \) used in this hypothesis test?

6. What approximation of the distribution of \( L \) under the null hypothesis should we use for this hypothesis test?

7. What is \( Z \), the standardized value of \( L \), for this particular sample?

8. What is the \( p \)-value of this hypothesis test for this sample? .

9. Did you find statistically significant evidence against the null hypothesis?

10. How should this be interpreted in terms of what it tells you about M&Ms?