ISyE 6739 – Group Activity 13

Names: Group Number:

Problem 1. A manufacturer claims that the thickness of the spearmint gum it produces is 7.5 one-hundredths of an inch. A quality control specialist regularly checks this claim. On one production run, she took a random sample of n = 10 pieces of gum and measured their thickness. She obtained:

7.65	7.60	7.65	7.70	7.55
7.55	7.40	7.40	7.50	7.50

a) Define a hypothesis test on mean and test it using test statistic, confidence interval, and p-value methods.
b) She claims that the mean thickness of gums is less than 7.5. Use a hypothesis test to verify this claim. (only one method would suffice)

Problem 2. A measurement operator claims that his measurements are quite repeatable. To verify this, we ask him to measure one part 8 times and record the measurement. If his claim is true the variance of measurements should not be more than 0.01.

7.62	7.58	7.62	7.65
7.53	7.42	7.42	7.52

a) Define a hypothesis test on variance and test it using test statistic, and confidence interval methods.
b) Test the same hypothesis for standard deviation (only one method would suffice).

Problem 3. An engineer from packaging department of m&m is interested in estimating the proportions of red candies. She takes a random sample of three fun size packets of m&m and count the number of red candies. She finds 12 reds out of 60 candies. Can she claim that 25% of candies are red?

Define a hypothesis test on proportion and test it using test statistic, confidence interval, and p-value methods.

Problem 4. The number of defects in a manufactured board is an important quality measure. A standard requires the average number to be less than 9. Define and test a hypothesis for the number of defects assuming it follows a Poison distribution.
Bonus: Solve this problem using Poisson distribution and compare the results.