Biological Statistics II - Discussion

BTRY3020/STSCI3200

2024

Things to complete:

    a.   All examples completed by the TAs
    b.   All of the problems assigned to you

Submission Instructions:

Refer to **Homework & Discussion Submission Rules** found in the **Course Information** module on Canvas.

Example #1

Problem #2:

newMysteryGenerator is a random number generator. It takes a single argument **n** that sets the number of values to be generated. **newMysteryGenerator** generates numbers from a mystery probability distribution. What probability distribution appears to be used?

- Give a name and values for all appropriate parameters.
- Justify your answer with a graph.
- Estimate the values of the parameters that are used to identify the distribution.

Problem #3:

Create a function **myMysteryGenerator**.

a.   It should have two arguments **n** and **j**.

b.   **myMysteryGenerator** should return a numeric vector with **n** elements.

    –   Each of the **n** values should be the average of **j** values generated by **newMysteryGenerator**. + Newly generated sets of **j** values should be used to generate each element of the returned vector. The default value for both **n** and **j** should be 1.

c.   How does the distribution of the values generated by **myMysteryGenerator** change as **j** increases from 1 to larger values ?(1,2,5,10,100)

    –   Use a series of at least 4 graphs to 'justify' your answer.

    –   You answer to this part should be written as plain text, not as a comment.

PROBLEM #4: Test the veracity of this statement: The mean of a Chi-Squared distribution is equal to its degrees of freedom.

Suppose a chi-squared distribution has 1 degree of freedom. If this statement is correct, what would be the mean of such a chi-squared distribution? Perform a test of the using a .05 significance level based on a sample of size 10 from a Chi-Squared distribution with 1 degree of freedom. Check any necessary assumptions. Report the p-value, test statistic, and the critical values that would be used for such a test. Explain the inherent problems with this particular test. Make some graphs to assist in your explanation.