

STAT 400 Discussion 9

1. Here we will review question 3 from midterm 3. Given the information in part a-e, determine the distribution of Y and identify the parameters that distribution will have
 - (a) $Y = \sum_{i=1}^n X_i$ where $X_i \sim Ber(p)$
 - (b) $Y = \sum_{i=1}^n X_i$ where $X_i \sim Geom(p)$
 - (c) $Y = \sum_{i=1}^n X_i$ where $X_i \sim Pois(\lambda)$
 - (d) $Y = \sum_{i=1}^n X_i^2$ where $X_i \sim N(0, 1)$
 - (e) $Y = \sum_{i=1}^n X_i$ where $X_i \sim Exp(\theta)$
2. In a fierce debate, Albert claims that Chloe finishes a higher proportion of a box of dog treats than Theren's dog Petey, before the treats go stale. From a sample of 100 boxes of treats, Chloe and Petey finished 94 and 90 boxes respectively. Use the .05 level of significance to test if Chloe finishes a higher proportion of boxes.
3. We would like to compare the two un-pooled methods for conducting a hypothesis test for two samples. Sometimes it is difficult to obtain large sample sizes in drug trials or other real life situations. We would like to see how results differ from the welch and conservative approach when these differences exist, at the .05 level. Assume that the sample information is as follows

$$\bar{X} = 25.2, s_x^2 = 21, n = 15$$

$$\bar{Y} = 28, s_y^2 = 23, n = 50$$

4. We would illustrate the general shape of power for a hypothesis test. Recall that the power of a hypothesis is a function of the parameter of interest and can be found as the probability of rejecting the null when the null is false.
 - (a) What is the expected shape of power function for a right tailed test for mean when the population standard deviation is known?
 - (b) What is the expected shape of power function for a two tailed test for mean when the population standard deviation is known?