MATH 460: Probability & Statistics — January_2019

Ch 4 & Ch 6

Homework #4 — Dr. Basilio

Southern California Institute of Technology

DUE: Wed Feb_6 ∪ Thurs Feb_7

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Ch 4 Special Probability Distribution Functions

Poisson Distribution

Problem 1: Poisson-Distribution

If 1.5% of the electric bulbs manufactured by a company are defective, find the probability that in a sample of 100 bulbs,

(a) zero bulbs are defective?

(b) one bulb is defective?

(c) two bulbs are defective?

(d) greater than three but less than seven bulbs are defective

Problem 2: Poisson-Distribution

If the probability that an individual will suffer a bad reaction from injection of a given serum is 0.001, determine the probability that out of 2000 individuals,

(a) exactly three will suffer a bad reaction

(b) more than two individuals will suffer a bad reaction

Chapter 6: Estimation Theory

Confidence Intervals

Problem 3: Confidence Interval for population proportion

A sample poll of 100 voters chosen at random from all voters in a given district indicated that 55% of them were in favor of a candidate Archimedes. Find the 95%, confidence interval for the proportion of all the voters in favor of Archimedes.

Problem 4: Confidence Interval for population mean

Measurements of the diameters of a random sample of 200 ball bearings made by a certain machine during one week showed a mean of 0.824 inch and a standard deviation of 0.042 inch.

(a) Find a 98% confidence interval for the population mean (μ) of this data.

(b) Find a 99.73% confidence interval for the population mean (μ) of this data.

Problem 5: Confidence Interval for population mean

The trade volume of a stock is the number of shares traded on a given day. The following data, in millions (so that 6.16 represents 6,160,000 shares traded), represent the volume of PepsiCo stock traded for a random sample of 40 trading days in 2014.

6.16	6.39	5.05	4.41	4.16	4.00	2.37	7.71
4.98	4.02	4.95	4.97	7.54	6.22	4.84	7.29
5.55	4.35	4.42	5.07	8.88	4.64	4.13	3.94
4.28	6.69	3.25	4.80	7.56	6.96	6.67	5.04
7.28	5.32	4.92	6.92	6.10	6.71	6.23	2.42

Source: TD Ameritrade

(a) Find a 88% confidence interval for μ for the population mean of this data.

(b) Find a 94% confidence interval for the population mean of this data.