

Bus 273: Statistical Analysis for Business

Fall 2014

PROBLEM SHEET # 11

Problem 1: A random sample of 100 observations is to be drawn from a normally distributed population with a mean of 40 and a standard deviation of 25. Compute the probability that the mean of the sample will exceed 45.

Problem 2: The lifetime of an electric bulb is an exponentially distributed random variable with mean 2500 hours.

- a) What is the probability that a typical light bulb will burn for at least 3000 hours?
- b) A light installation has 10 bulbs. What is the probability that *all* of them will last for at least 3000 hours?

Problem 3: When the euro was introduced, statisticians said that the one euro coin does not have an equal chance of landing “heads” or “tails”. They allege that, when spun on a smooth surface, the coin comes up heads more often.

In a spin experiment carried out by students, this coin fell heads 537 times in a series of 1000.

- a) Assuming the coin is fair, what is the probability that it falls heads more than 537 times when spun 1000 times?
- b) Assuming the coin is fair, what is the probability that it falls heads more than 537 times or less than 463 times when spun 1000 times?