Lecture 19

Problem: Verbal SAT scores are normally distributed with a mean score of 430 and variance 100. What is the middle range of scores encompassing 50% of the population?

Problem: The automatic opening device of a military parachute is designed to open when the parachute is 200 metres above ground. Suppose that the opening altitude has a normal distribution with mean 200m and standard deviation 30m. Equipment damage occurs if the parachute opens at an altitude of less than 100m above ground. What is the probability that there is equipment damage to at least one of five independently dropped parachutes?

Problem: The temperature reading from a thermocouple in a constant-temperature medium is normally distributed with mean μ (the actual temperature of the medium) and standard deviation σ. What is the value of σ such that 95% of all readings are within 0.1 degree of μ?

Problem: A patient is hypokalemic if their level of potassium is 3.5 or less. An individual's level is not constant, but varies daily. Suppose that the variation is normal. Judy has a mean level of 3.8 with variance 0.04. If she is measured daily, what proportion of days would she be declared hypokalemic?

Problem: A college has a target enrollment of 1200 students. Since not all admitted students actually enroll, the college admits 1500 students. Past experience shows that 70% of students who are offered admission enroll.

(a) Give a statistical model for the number of students who enroll.

(b) Obtain the corresponding mean and std dev.

(c) Obtain the prob that at least 1200 enroll.

Problem: The volume placed in a bottle by a bottling machine follows a $\text{Normal}(\mu, \sigma^2)$ **distribution. Over a long period of time, it is observed that 5% of the bottles contain less than 31.5oz and 15% contain more than 32.3oz.**

(a) Find μ **and** σ**.**

(b) Calculate the probability that out of 10 bottles purchased, exactly three bottles contain more than 32.2 oz.