Stat 10, Section 1A
Thursday, April 15th, 2010

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Taxes are due today.

1 Examples

p151, #43ac. Using $N(1152, 84)$, the normal model for weights of Angus steers in Exercise 19, what percent of steers weigh...

(a) over 1250 pounds?

(c) between 1000 and 1100 pounds?

p151, #45bc. Based on the model $N(1152, 84)$ describing Angus steer weights, what are the cutoffs for...

(b) the lowest 20%?

(c) the middle 40%?

p198, #17 modified. In a box of Kellogg's Corn Flakes, there is a 10% chance of getting a coupon for a free box of cereal, a 20% chance of getting a code for a free song from iTunes, and a 70% chance of getting a children's prize. You plan to buy 7 boxes of cereal but want to estimate the chance you will get all three prizes. Describe how you would estimate this probability using simulation.

2 Tip on working with normal models

In most "beginner" normal model problems, we

1. draw a picture,

2. identify the mean μ, standard deviation σ, and some cutoff x,

3. compute a Z score, $Z = \frac{x-\mu}{\sigma}$, and

4. use the normal table to get some tail area.

We can visualize this as

$$x, \mu, \sigma \overset{formula}{\rightarrow} Z \ score \overset{table}{\rightarrow} \text{percent or probability}$$

In a second type of problems, we might start with a percent, identify the Z score, and then compute the cutoff x (assuming we know μ and σ). In other words, we just work backwards from before:

$$x, \mu, \sigma \overset{formula}{\leftarrow} Z \ score \overset{table}{\leftarrow} \text{percent or probability}$$

In both types of problems, notice that you must always find the Z score before getting your final answer. So after drawing a picture, you should *usually* aim to identify the Z score.

3 Handout on normal models, which is posted on Moodle

4 Quiz problems

(5) Volunteers from Heal the Bay determined that the lengths of individual shellfish in the population of 10,000 shellfish are nearly normal with mean 10 centimeters and deviation of 0.2 centimeters. Determine the shortest interval that contains approximately 4,000 shellfish.

   (a) 0 cm to 9.949 cm

   (b) 9.744 cm to 10.0 cm

   (c) 9.774 cm to 10.256 cm

   (d) 9.895 cm to 10.105 cm

   (e) 9.9280 cm to 10.080 cm