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STA 3032
Section 7370
Quiz #1
Spring, 2009

1. Following are daily kilowatt-hour (kwh) consumption data of a home for 21 days:
17 33 33 35 43 57 62 63 65 65 66 66 75 77 78 79 82 85 93 94 94

a. (5 pts) The mean and standard deviation of the data are $\bar{y} = 64.8$ and $s = 21.9$. The mean is computed as $\bar{y} = (17 + 33 + 33 + 35 + \dots + 93 + 94 + 94) / 21$. In a similar manner, show how the standard deviation is computed:

$$s = \sqrt{(17 - 64.5)^2 + (33 - 64.5)^2 + \dots + (94 - 64.5)^2 + (94 - 64.5)^2} / 20$$

b. (5pts) Find the **quartiles** of the data: $Q_1=57$ $Q_2=66$ $Q_3=79$

c. (5 pts) The price of electricity is 12 cents per kwh. What would be the **mean** and **variance** of the **daily costs** to the homeowner for the 21 days:

$$\text{mean} = .12(64.8)$$

$$\text{variance} = (.12)^2(21.9)^2$$

2. Twenty percent of the homes in Gainesville have a swimming pool, and 25% of the homes have a fireplace.

a. (5 pts) Three homes are randomly selected from a list of all homes in Gainesville. What is the probability that all three homes will have a pool?

$$P(X = 3) = .2^3$$

b. (5 pts) Of the homes in Gainesville that have a pool, 80% also have a fireplace. One home is randomly chosen from those that have a **fireplace**. What is the probability that it will have a pool?

$$P(SP) = .2$$

$$P(FP | SP) = .8$$

$$P(FP \cap SP) = P(FP | SP)P(SP) = (.8)(.2) = .16$$

$$P(SP | FP) = P(FP \cap SP) / P(FP) = .16 / .25 = .64$$