Math 220 : Elementary Statistics — Kane Nashimoto
Exam 1 Solutions
Spring 2008

1. Numerical summary of data.

   Note : $\sum x = 349$; $\sum x^2 = 16827$; $n = 8$

   (a) $m = \dfrac{41 + 43}{2} = 42.000$

   (b) $\bar{x} = \dfrac{\sum x}{n} = \dfrac{349}{8} = 43.625$

   $s = +\sqrt{\dfrac{\sum x^2 - (\sum x)^2/n}{n-1}} = +\sqrt{\dfrac{16827 - (349)^2/8}{8-1}} = 15.127$

   (c) The distribution of the data is skewed to the right (mean > median).

2. Bias in scientific studies.

   An example of a study in which the sample is not representative of the target population.

3. Types of variables.

   (a) Quantitative / discrete
   (b) Categorical
   (c) Categorical
   (d) Quantitative / continuous

4. Variability of data.

   (a) IQR = Q3 − Q1 = 111 − 69 = 42
   (b) No, because 168 is less than 111 + 1.5(42) = 174.
   (c) $z = \dfrac{x - \bar{x}}{s} = \dfrac{35 - 89}{29} = -1.862$
   The price for this bike is 1.862 standard deviations below the mean price.

5. Experimental design.

   (a) List of registered voters.
   (b) Some people selected were not reached; some people reached refused to participate.
   (c) $\dfrac{283}{672} = .421 \Rightarrow 42.1\%$
   (d) $\dfrac{1}{\sqrt{n}} \times 100 = \dfrac{1}{\sqrt{672}} \times 100 = 3.9$

6. Graphical summary of data.

Stem	Leaf
5	1
5	33
5	
5	677
5	9
6	01
6	2