

## QUANTITATIVE METHODS

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# Assignment 5 SOLUTIONS

This assignment is due *Monday February 7, 2005* at the beginning of the class.

### Question 1 (15 points)

The QM club has 10 members. At its last meeting, each of the members took an IQ test. Here are the results.

102    110    112    112    116    118    119    124    132    141

Compute the mean, median, mode, 20% trimmed mean, range, variance, standard deviation and coefficient of variation for the IQ of the members of the QM club.

$$\text{Mean : } \mu = \frac{\sum x}{N} = \frac{1186}{10} = 118.6$$

$$\text{Median} = 117$$

$$\text{Mode} = 112$$

$$20\% \text{ of } 10 = 2 \qquad 20\% \text{ trimmed mean} = \frac{\sum x}{n} = \frac{701}{6} = 116.8$$

$$\text{Range} = \text{Max} - \text{Min} = 141 - 102 = 39$$

$$\text{Variance } \sigma^2 = \frac{\sum x^2 - \frac{(\sum x)^2}{N}}{N} = \frac{141814 - \frac{1186^2}{10}}{10} = 115.4$$

$$\text{Standard Deviation } \sigma = \sqrt{\sigma^2} = \sqrt{115.4} = 10.7$$

$$\text{CV} = \frac{\sigma}{\mu} = \frac{10.7}{118.6} = 0.091 = 9.1\%$$

**Question 2** (15 points)

A random sample of 7 students was given a puzzle to solve in which they were timed. Here are the recorded times (in minutes).

12      13      15      17      22      25      26

Compute the mean, median, mode, 10% trimmed mean, range, variance, standard deviation and coefficient of variation.

$$\text{Mean : } \bar{x} = \frac{\sum x}{n} = \frac{130}{7} = 18.6 \text{ minutes}$$

Median = 17 minutes

Mode none

$$10\% \text{ of } 7 = 0.7 \quad 10\% \text{ trimmed mean} = \frac{\sum x}{n} = \frac{92}{5} = 18.4 \text{ minutes}$$

$$\text{Range} = \text{Max} - \text{Min} = 26 - 12 = 14 \text{ minutes}$$

$$\text{Variance } s^2 = \frac{\sum x^2 - \frac{(\sum x)^2}{n}}{n-1} = \frac{2612 - \frac{130^2}{7}}{6} = 32.95 \text{ minutes}^2$$

$$\text{Standard Deviation } \sigma = \sqrt{\sigma^2} = \sqrt{32.95} = 5.74 \text{ minutes}$$

$$\text{CV} = \frac{s}{\bar{x}} = \frac{5.74}{19.6} = 0.309 = 30.9\%$$