

ECO 239 Quiz 1 (Oct. 20.2008)

Data is given by stem-and-leaf display as follows. (Note: All variables have 2 digits.)

Stem	Leaf
1	0 5
2	0 5
3	0 5
4	0

Q1: Derive

- a) Mean
- b) Median
- c) Mode
- d) Range
- e) Interquartile Range
- f) Variance
- g) Standard Deviation
- h) Comment on the distribution (Hint: use Mean and Median)

Q2: Given the same data and intervals, fill in the table.

Interval	Frequency	Relative Frequency	Cumulative Frequency	Relative Cumulative Frequency
10 - 19				
20 - 29				
30 - 39				
40 -49				

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Answers:

Note: Data: { 10 15 20 25 30 35 40}

1.a.  $\bar{X} = \frac{\sum_{i=1}^7 x_i}{7} = 25$

1.b. Median position =  $0.5(n+1) = 0.5*8 = 4$ . => Mean = 25

**\*Note: Make sure to distinguish median position and median value. Some of you gave 4 as the median value, but it is not correct.**

1.c. Mode: No mode. **\* Note: Mode = 0 and No Mode mean two different things. Mode = 0 means the value 0 is the mode of the data, which is not correct in our case.**

1.d. Range =  $X_{\max} - X_{\min} = 40 - 10 = 30$

1.e. Interquartile Range:  $Q1 \text{ position} = 0.25 \cdot (n+1) = 0.5 \cdot 8 = 2 \Rightarrow Q1 = 15,$

$Q3 \text{ position} = 0.75 \cdot (n+1) = 0.75 \cdot 8 = 6 \Rightarrow Q3 = 35.$

Interquartile Range =  $Q3 - Q1 = 35 - 15 = 20.$

**\*Note: Make sure to compute  $Q3 - Q1$  as Interquartile Range. Some of you computed  $Q3$  and  $Q1$  values, but did not derive the final answer.**

1.f. sample variance =  $\frac{\sum_{i=1}^7 (x_i - \bar{x})^2}{(n - 1)}$

=  $[(10-25)^2 + (15-25)^2 + (20-25)^2 + (25-25)^2 + (30-25)^2 + (35-25)^2 + (40-25)^2] / 6$   
=  $700/6 = 116.67 //$

1.g. sample standard deviation =  $\text{sq.rt}(\text{sample variance}) = \text{sqrt}(116.67) = 10.8$

1.h. Since Mean = Median, we have **Symmetric** distribution.

2.

Interval	Frequency (1)	Relative Frequency (%) (2)	Cumulative Frequency (From (1))	Relative Cumulative Frequency (%) (From (2))
10 - 19	2	$=2/7 \cdot 100 = 28.57$	2	28.57
20 - 29	2	28.57	4	57.14
30 - 39	2	28.57	6	85.71
40 - 49	1	14.29	7	100

Comments:



- Overall, most of you did very well. Keep up with the good work!
- Yet, some of you had difficulty in some questions. If you have any question/problem regarding to this quiz, come and talk to me.
- I code differently for students take the quiz and get zero point and for students who do not take the quiz. (Obviously, some points for those who got zero by taking the quiz, but no point for those who did not take.) Therefore, do not be discouraged to show up to the class and take quizzes even if you feel like you are not prepared.
- I observed some “copies” on some students’ answer sheets. As I said before/during the quiz, I take cheating very seriously. (Moreover, I take “Fairness” very seriously.) Students who did copy will be punished accordingly (both the student who copied and who helped copying).