

Statistics

Lecture 2



Feb 19-8:47 AM

Definitions and terminologies:

What is statistic?

It is about collecting information (Data), organize them, Graph them, do some calculations, and we learn from it to draw conclusion.

Two Branches

1) **Descriptive**: Collect data, and organize, graph, and calculate certain things.

2) **Inferential**: we use the results of descriptive statistics to draw conclusion and make predictions.

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Population (Entire Field) vs. **Sample** (Collected Randomly from Population)

Parameter vs. **Statistic**

Average age of **all doctors** in LA is 50yrs.
Parameter

Median rent in LA for **20 Selected** 2B2B apt. is \$2000/mo.
Statistic

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Data (information)

- 1) Qualitative Non-Numerical
 - eye color
 - Type of drinks
 - Brand of cars
- 2) Quantitative Numerical
 - 1) Discrete Countable
 - # of students
 - 2) Continuous Measurable
 - Room temp.

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Level of measurements:

- 1) Nominal Red, white, Blue
 Small, Med., Large
 Toyota, Ford, Chevy
- 2) Ordinal order is meaningful
 Small, Med, Large
- 3) Ratio Ratio is meaningful.
 Small (100%) Large (200%)
- 4) Interval Range of values
 90% - 100% → A

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Methods to collect data:

- 1) Systematic every kth item selected.
- 2) Stratified Divide into groups,
 Select few from each group.
 Males → Select 4
 Females → Select 6
- 3) Cluster Divide into groups
 Select some of the groups
 Collect information from entire
 selected groups.
 20 classes at this HS.
 Select 4 classes,
 ask all students to
 complete a survey.
- 4) Random/
 Convenience The least
 reliable method to
 do survey.

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Observation	vs	Experiment
to observe changes without any action taken.		You take action to observe changes.
Given Max = 60 , Min = 20		
1) $\text{Max} - \text{Min} = 60 - 20 = 40$		1) <u>40</u>
2) $\frac{\text{Max} + \text{Min}}{2} = \frac{60 + 20}{2}$ $(60 + 20) \div 2$		2) <u>40</u>
3) $\frac{\text{Max} - \text{Min}}{4} = \frac{60 - 20}{4} = 10$ $(60 - 20) \div 4$		3) <u>10</u>
SG 1 & SG 2		

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Consider the Sample below Sample Size

2 3 3 3 4 1) $n = 5$

2) Range = Max - Min = $4 - 2 = 2$

3) Midrange = $\frac{\text{Max} + \text{Min}}{2} = \frac{4 + 2}{2} = \frac{6}{2} = 3$

4) Mode 3 5) Median 3

6) $\sum x = 2 + 3 + 3 + 3 + 4 = 15$
↑
Summation

7) $\sum x^2 = 2^2 + 3^2 + 3^2 + 3^2 + 4^2 = 47$

8) $\frac{\sum x}{n} = \frac{15}{5} = 3$

9) $\frac{n \sum x^2 - (\sum x)^2}{n(n-1)} = \frac{5 \cdot 47 - 15^2}{5(5-1)} = \frac{10}{20} = \frac{1}{2} = .5$

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