

Topic 18: Parameter Estimation Basics

02-680: Essentials of Mathematics and Statistics

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What is a “Statistic”?

Definition: Anything that can be computed from the collected data
(i.e., must be observable).

Statistics deals with data.

Goal: Make inferences based on data

This process can be divided into three overlapping phases

- (1) **Collecting data** — collect data in experiments; Preceded by forming hypotheses about phenomena of interest
- (2) **Describing data** — describe the results
- (3) **Analyzing data** — infer from the results the strength of the evidence with respect to the hypotheses

Generally two types of statistics

Point statistic — a single value computed from data (e.g., \overline{X}_n)

Interval or range statistics — an interval $a \leq x \leq b$ computed from the data

Note that a statistic is itself a random variable because a new experiment will produce new data to compute it.