Introduction to Business Statistics

Professor Jarad Niemi

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Statistics

Definition

The field of Statistics is the mathematical science involving the collection, analysis, and interpretation of data.

There are a number of specialties that have evolved to apply statistical methods:

- Actuarial science
- Business analytics
- Psychometrics
- Quality control
- Reliability engineering
- Statistical finance

Business statistics

Definition

Business statistics is the science of good decision making in the face of uncertainty and is used in many disciplines such as financial analysis, econometrics, auditing, production and operations including services improvement, and marketing research. (JBES, 1993) [a]

[a] from Wikipedia referencing the Journal of Business and Economic Statistics

- virtually all business decisions are based on information gathered from data
- statistics is about extracting helpful information from data
- to be helpful, data have to be representative (more later)

What is Business Statistics used for?

- Inventory management
- Price prediction
- Evaluation of advertisement
- ...

Why should you care?

"It made all the difference in my career and could in yours too." (former manager & Vice President of M.I.S. at Hy-Vee in Des Moines)

Variation

Definition

Variation/variability refers to differences in a characteristic among individuals or items; variation can also refer to fluctuation over time. Variation is at the heart of statistics.

Examples:

- stock values vary on a daily basis
- sales for a company/store vary on a daily basis
- commodities vary
- customers' preferences for certain product features vary
- ...

Data

Some first observations about variation:

- Variation is everywhere.
- Individuals vary on many physical characteristics.
- Repeated measurements on an individual's characteristic are variable.
- Variability can have different causes.
- Both qualitative and quantitative variables reveal variability in data.
- Some things vary just a little, some vary a lot.

Variability is what makes decisions in the face of uncertainty so difficult. Variability is what makes statistics so interesting and allows us to interpret, model and make predictions from data (Gould, 2004).

The concept of variability will accompany us throughout all of the semester.

Course outline

- Part 1 - Midterm 1
  - Modules 1-4
  - Chapters 1-4,12,14.1
- Part 2 - Midterm 2
  - Modules 5-6
  - Chapters 15,16
- Part 3 - Final Exam
  - Modules 7-8,9(?)
  - Chapters 6,19,21,12(?),13(?)

Part 1 Outline

Content through Midterm 1

- Module 1
  - Chapter 1 – Introduction: "What is Statistics?"
  - Chapter 2 – Data
  - Chapter 3 – Describing Categorical Data
- Module 2
  - Chapter 4 – Describing Numerical Data
- Module 3
  - Chapter 12 – The Normal Probability Model
- Module 4
  - Chapter 14.1 – Sampling Distribution of the Mean