

GLOBAL
EDITION



Introductory Statistics

TENTH EDITION

Neil A. Weiss

ALWAYS LEARNING

PEARSON



Introductory Statistics

Fourth Edition

David A. Warden

PEARSON

Course Overview (1)

IM2201: 統計學(1) **Statistics (I)**

資管系 Information Management

課程負責教師:

- Dr Y-I Chiang, (江彥逸)
- Email: yenichn@mail.cgu.edu.tw
- Algorithms, Data Analysis, and Soft-computing

Course Overview (4) 課程講義網址

Weekly course **Materials** for this course

- I will update it can be downloaded at following ftp site:

[ftp://163.25.117.117/yen/STA 1/](ftp://163.25.117.117/yen/STA%201/)

Tutors for this course

- 資管四乙 曾妍菲同學
- 手機: ???
- 信箱: style1688@gmail.com

Course Overview (2) 教科書

Neil A. Weiss. Introductory Statistics 10 版., Pearson, Addison Wesley, 2017.

華泰文化，tel:02-2162-1217 Ext. 127

web site: <http://www.hwatai.com.tw>

Contact Person:

鍾蒂蓉 sales10@hwatai.com.tw

Cell Phone No.: 0912-679877

	上課日期	教學進度
1	2018-09-11	Introduction to Statistics
2	2018-09-18	Organizing Data
3	2018-09-25	Data Description: Graphs, Charts, and Tables
4	2018-10-02	Data Description: Measure of Central Tendency & Variation
5	2018-10-09	Introduction to Probability [Class Test 1]
6	2018-10-16	Discrete Probability Distribution (1)
7	2018-10-23	Discrete Probability Distribution (2)
8	2018-10-30	Continuous Probability Distribution
9	2018-11-06	Midterm Examination
10	2018-11-13	Continuous Probability Distribution
11	2018-11-20	Sampling and Sampling Distribution (1)
12	2018-11-27	Sampling and Sampling Distribution (2)
13	2018-12-04	Introduction to Estimation Interval Estimation (1) [Class Test 2]
14	2018-12-11	Introduction to Estimation Interval Estimation (2)
15	2018-12-18	Hypothesis testing (1)
16	2018-12-25	Hypothesis testing (2)
17	2019-01-01	Holiday
18	2019-01-08	Final Examination

重要的日期

日期	時數	In Class
<u>(05) 2018-10-09</u>	45 min.	Class Tests 1 (10%)
<u>(13) 2018-12-04</u>	45 min.	Class Tests 2 (10%)
<u>(09) 2018-11-06</u>	2~2.5 h	期中考 (25%)
<u>(18) 2019-01-08</u>	2.5 h	期末考 (30%)

成績考核

1. 課堂小考 20% (各10%);
2. 課中參與積極性 10%; (點名,-2 for each absentee)
3. 課堂活動 (作業或其它) 15%; (挑選教完的章節)
4. 期中考 25%;
5. 期末考 30%.

Course Overview (3) 參考書

1. Neil A. Weiss. Introductory Statistics 9th ed., Pearson, Addison Wesley, 2015. (華泰文化) 或 Neil A. Weiss. Introductory Statistics 8th ed., Pearson, Addison Wesley, 2008. (華泰文化)
2. Lind, D. A., Marchal, W. G., and Wathen, S. A. Statistical Techniques in Business and Economics, McGraw Hill, 12th edition, 雙葉, 2005.
3. 林惠玲、陳正倉 應用統計學3rd ed., 雙葉。
4. Moore D. S., et al. The Practice of Business Statistics, W. H. Freeman and Company, New York, 2nd ed., 2009. (華泰文化)



師生互動時間

Office hour

星期二下午 14 : 00 ~ 16 : 30

AACSB

Core competence:

- Problem Solving Capabilities: Data Collection, Analysis and Organization, Self-Learning, and Problem Solving (100%)

Learning goals (1): **BS-LG1-LO1: Core Foundations**

Program Learning Goal: Students will acquire understanding of the major disciplinary theory in the chosen field.

Program Learning Objective: Students will understand the core foundations of management.

重要的公告

- Currently, university is using online **roll call**, which will be logged at the **first period of each week's lectures** (any measure taken by the university, due to its regulation rules, result from your absences will not be my responsibility; you have been warned).
- During examines or tests, **no cell phone or other none sanctioned electronic equipments are allowed**; if any such equipment found during test time, will be **disqualify from the examines** or the tests, furthermore, the incident will be reported to the University.
- **No eating or beverage drinking** is allowed in classroom.

重要的公告

- I do not take cheating lightly, any one or group found cheating (copy homework or cheat during examination or test) will be disqualified from the exams or the tests; furthermore, the incident will also report to the University.
- *Only reminder on test-venues, test time and date* will be announced in class, by **OFFICIAL PERSONNEL** (i.e. me or the tutors). Anything posted on the web that were unsanctioned by me, I and this course will not take any responsibility for the consequences that resulted from your lack of common sense (i.e. do not believe it).

What is Statistics?

Statistics: The science of *collecting, describing,* and *interpreting* data

Two areas of statistics:

- *Descriptive Statistics*: collection, presentation, and description of sample data (in STA 1)
- *Inferential Statistics*: making decisions and drawing conclusions about populations (in STA 2)

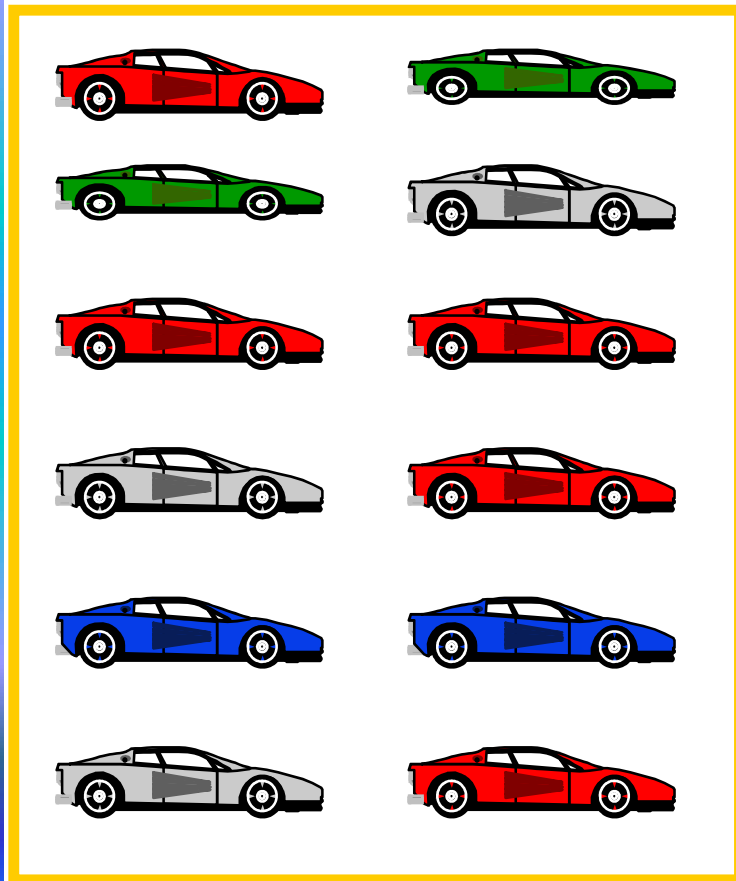
Introduction to Basic Terms

Population: A collection, or set, of individuals or objects or events whose properties are to be analyzed

- Populations can be *finite or infinite*

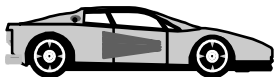
Sample: A subset of the population

Population and Census Data



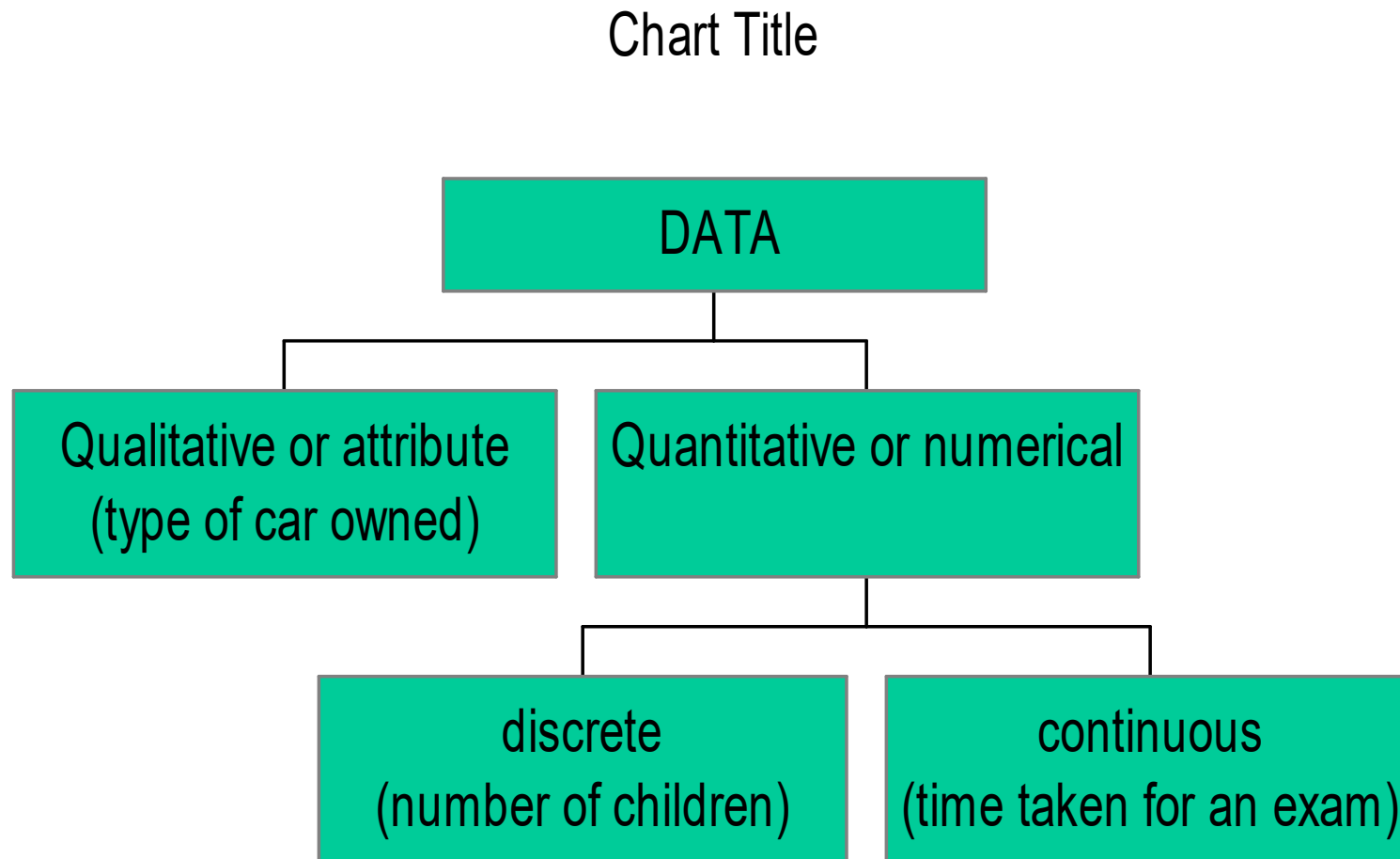
Identifier	Color	MPG
RD1	Red	12
RD2	Red	10
RD3	Red	13
RD4	Red	10
RD5	Red	13
BL1	Blue	27
BL2	Blue	24
GR1	Green	35
GR2	Green	35
GY1	Gray	15
GY2	Gray	18
GY3	Gray	17

Sample and Sample Data



Identifier	Color	MPG
RD2	Red	10
RD5	Red	13
GR1	Green	35
GY2	Gray	18

Summary of Types of Variables



Key Definitions

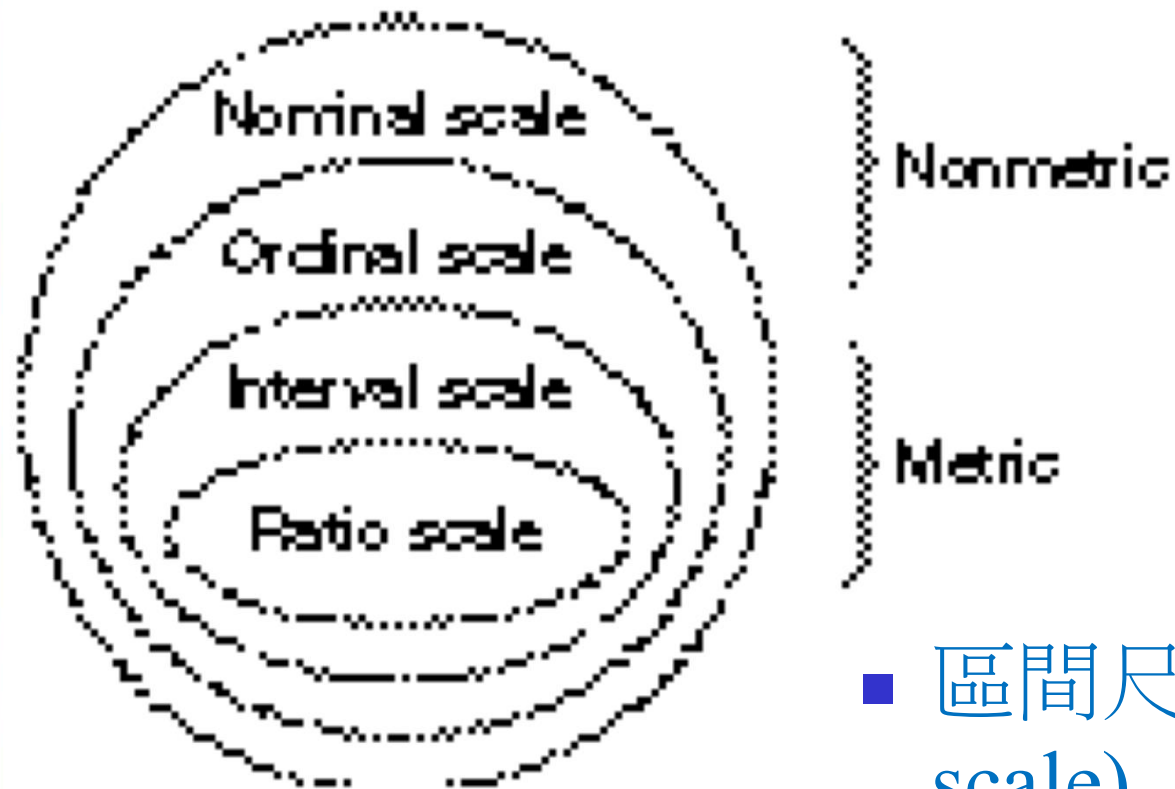
Discrete Variable: A quantitative variable that can assume a countable number of values

- Intuitively, a discrete variable can assume values corresponding to isolated points along a line interval (that is, there is a gap between any two values)

Continuous Variable: A quantitative variable that can assume an uncountable number of values

- Intuitively, a continuous variable can assume any value along a line interval, including every possible value between any two values.

變數資料之類型



- 名目尺度(nominal scale)
- 序列尺度(ordinal scale)

- 區間尺度(interval scale)
- 比率尺度(ratio scale)

Population Mean or Sample Mean

Population mean: $\mu = \frac{\sum X_i}{N} = \frac{X_1 + X_2 + X_3 + \cdots + X_N}{N}$

Sample mean: $\bar{X} = \frac{\sum X_i}{n} = \frac{X_1 + X_2 + X_3 + \cdots + X_n}{n}$

where μ is the population mean.

- N and n is the total number of observations in the population and sample respectively.
- X is a particular value.
- Σ indicates the operation of adding.

Population Variance and Standard Deviation

The **population variance** is the arithmetic mean of the squared deviations from the population mean:

$$\sigma^2 = \frac{\sum (X - \mu)^2}{N}$$

The **population standard deviation** is the square root of the population variance:

$$\sigma = \sqrt{\sigma^2}$$

Sample Variance and Sample Standard Deviation

THE STANDARD DEVIATION s

The **variance** s^2 of a set of observations is the average of the squares of the deviations of the observations from their mean. In symbols, the variance of n observations x_1, x_2, \dots, x_n is

$$s^2 = \frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n - 1}$$

or, more compactly,

$$s^2 = \frac{1}{n - 1} \sum (x_i - \bar{x})^2$$

The **standard deviation** s is the square root of the variance s^2 :

$$s = \sqrt{\frac{1}{n - 1} \sum (x_i - \bar{x})^2}$$

Sample Standard Deviation

- A convenient way of finding the sample standard deviation is:

$$\begin{aligned} s &= \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}} \\ &= \sqrt{\frac{\sum_{i=1}^n x_i^2 - \left(\sum_{i=1}^n x_i \right)^2 / n}{n - 1}} \end{aligned}$$

Statistics & the Technology

- Electronic technology has had a tremendous effect on the field of statistics
- Many statistical techniques are repetitive in nature: computers and calculators are good at this
- Many statistical software packages: MINITAB14, SYSTAT, STATA, SAS, SPSS, and calculators

Remember!

- Responsible use of statistical methodology is very important. The burden is on the user to ensure that the appropriate methods are correctly applied and that accurate conclusions are drawn and communicated to others.