CHAPTER 1

INTRODUCTION TO STATISTICS

WHAT IS STATISTICS ???

Statistics is a group of methods used to collect, analyze, present and interpret numerical data to assist in making more effective decisions.

Who Uses Statistics ??

Statistical techniques are used extensively by ***marketing***, ***accounting***, ***quality control***, ***consumers***, ***professional sports people***, ***hospital administrators***, ***educators***, ***politicians***, ***physicians***, etc…

2

TYPES OF STATISTICS

- **Descriptive Statistics**

- Methods of organizing, summarizing, and presenting data in an *informative way* (tables, graphs, and summary measures).

- Example:

✓ Americans spent an average of 1669 hours, which is equivalent to almost 70 days or 10 weeks, watching television in 2004.

3

TYPES OF STATISTICS

- **Inferential Statistics**

- Methods that use *sample results* to help make decisions or predictions about a population.

- Example :

➢ The accounting department of a large firm will select a sample of the invoices to check for accuracy for all the invoices of the company.

4

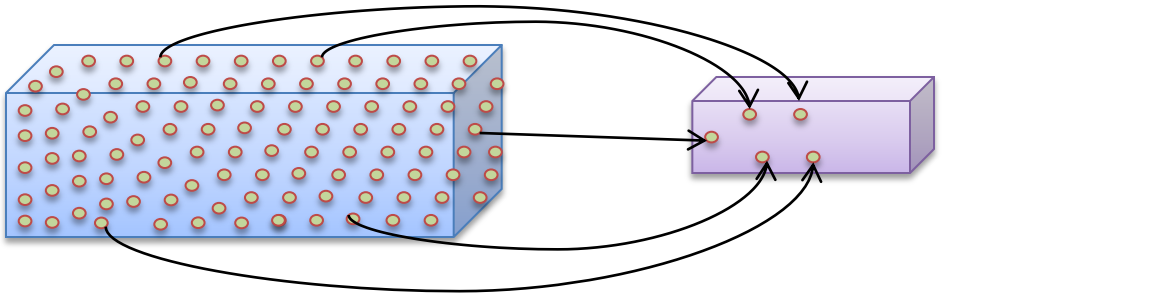
POPULATION VERSUS SAMPLE

- **Population**

- A collect on of ALL possible individuals, objects or measurements whose characteristics are being studied.

- **Sample**

- A portion, or part, of the population of interest.



5

BASIC TERMS

- **Element / Member**
  - A specific subject or object about which the information is collected.
- **Variable**
  - A characteristic under study that assumes different values for different elements.
- **Observation / Measurement**
  - The value of a variable for an element.
- **Data Set**
  - A collection of observations on one or more variables.

6

Table ： 2004 Profits of Seven U.S. Companies

Company	2004 Profits (millions of dollars)
Wal-Mart Stores	10,267
Exxon	25,330
General Electric	16,593
Citigroup	17,046
Home Depot	5001
Pfizer	11,361
Target	3198

Variable

An element or a member

An observation or measurement

7

TYPES OF VARIABLES

- **Qualitative Variables**

- A variable that cannot assume a numerical value but can be classified into two or more nonnumeric categories.
- Example:

  Gender, type of automobile owned, state of birth or hair color

- **Quantitative Variables**

- A variable that can be measured numerically
- Example :

  Balance in account, number of children in a family or minutes remaining in class

8

Quantitative data

Age	income
55	75000
42	68000
.	.

Weight gain
+10
+5
.
.

Qualitative data

With qualitative data, all we can do is, calculate the proportion of data that falls into each category.

1	yes
2	no
3	no
.	.
.	

Lecturer	Rank
1	Lecturer
2	Professor
3	Senior lecturer

Assoc Lect	Lecturer	Senior Lect	Professor	Total
15	25	15	5	60
25%	41.67%	25%	8.33%	

QUANTITATIVE VARIABLE

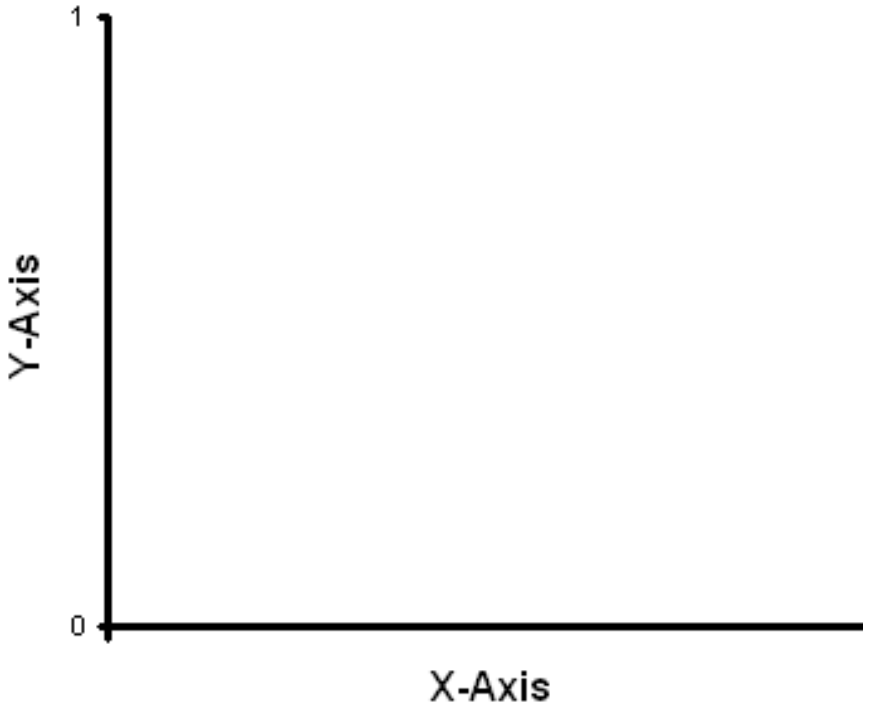
- **Discrete Variables**

- Can assume only certain values with *no intermediate values*.
  Example :
  The number of cars in a parking lot, the number of students in a class (1,2,3,…,etc)

- **Continuous Variables**

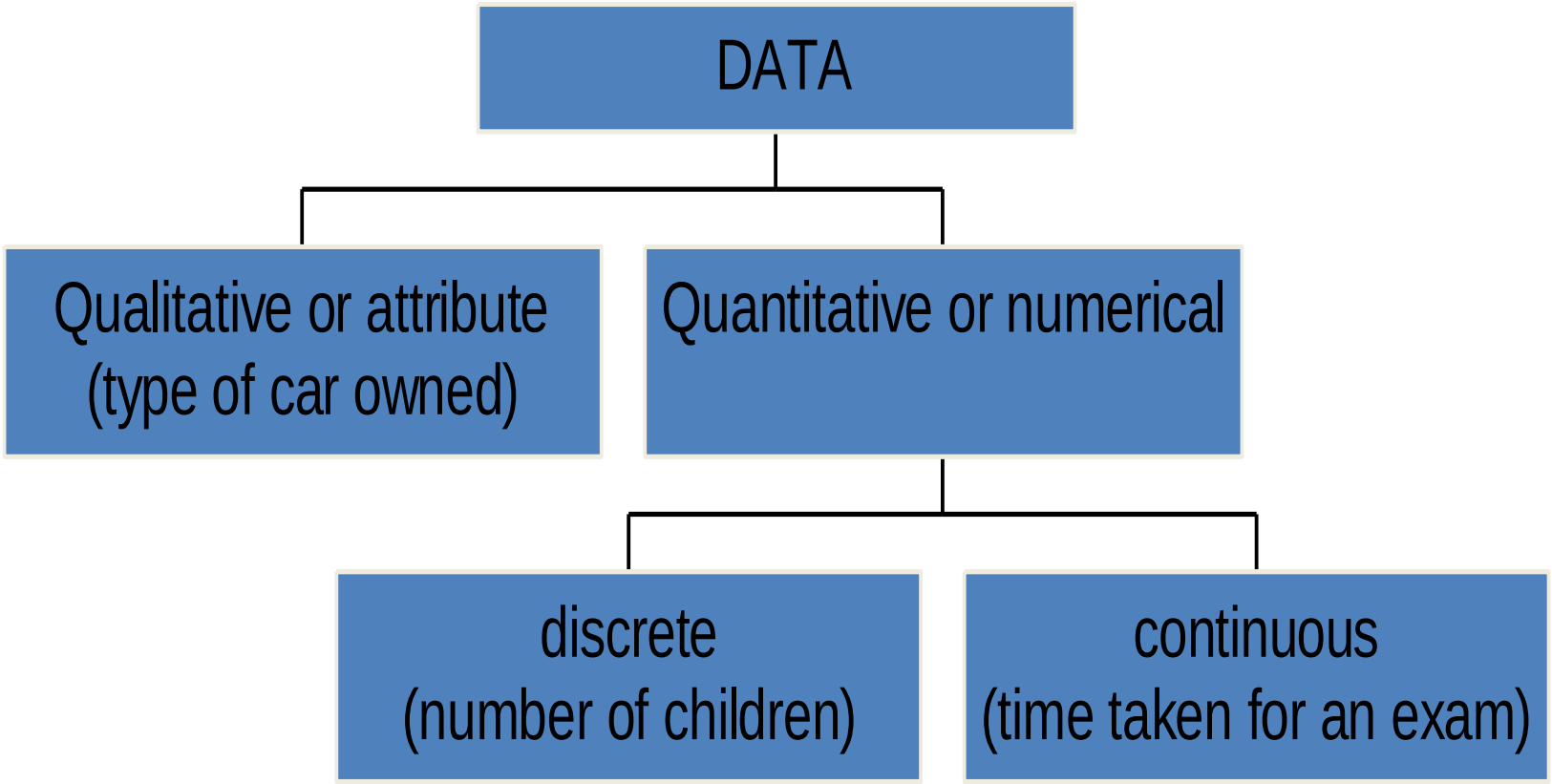
- Can assume *any value* within a specified range.
  Example :
  Height of students in a class, the weights of people, the time taken to complete a test.

10


1
Y-Axis
0
X-Axis


1
Y-Axis
0
X-Axis

SUMMARY OF TYPES OF VARIABLES



12