

2 General Kinds of Data (but 3 families)

+ Discrete Data (a.k.a. - Attributes Data) (Count Data)

**Type-I
Attributes
Data**
(Binomial
Distribution)

- **(#1) Number of Items in a Category (&Count-Based Proportions)**
(Where can count both the number of occurrences and non-occurrences)
 - Heads / Tails (i.e., counting # of Heads and # of Tails)
 - Yes / No (Order Form Filled Out Accurately or Not)
 - Pass / Fail; Good / Bad (Accurate Billing/Overcharged)

**Type-II
Discrete
Data**
(Poisson
Distribution)

- **(#2) Counts of Discrete Event Occurrences**
(Where can not count the number of non-occurrences)
 - # of Scratches on a Car Hood
 - # of Employee Accidents per Month
 - # of Insulation Breaks in a Spool of Wire

Just ask
yourself,
“Am I
counting
things,
here”?
If yes, you
have
attributes
data.

• Continuous Data (a.k.a. - Variables Data) (Measured Data)

- > Decimal subdivisions are meaningful
- Ex: Time to answer the telephone

Different Types Of Data Require Different Analysis Tools

3 Families of Data:

Manufacturing Process: Making Sheets of Glass

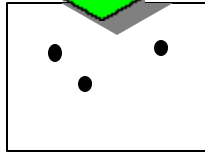
DISCRETE DATA

“Am I Counting Things?”
(Attributes Data)

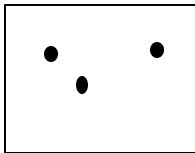
Any Bubbles?
(accept / reject
the entire item)

Number of
Bubbles?

Sample#1

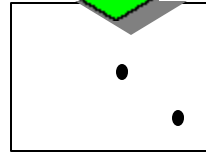


Reject

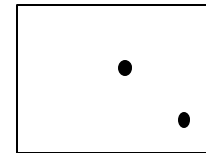


3 Bubbles

Sample#2

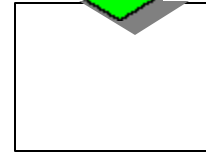


Reject

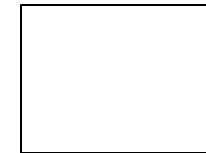


2 Bubbles

Sample#3

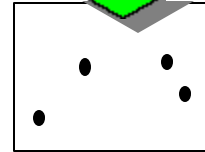


Accept

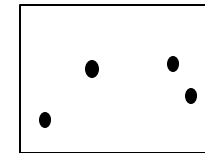


0 Bubbles

Sample#4



Reject



4 Bubbles

Binomial
Distribution

Poisson
Distribution

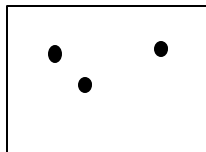
CONTINUOUS DATA

(Variables Data)
(Measurement Data)

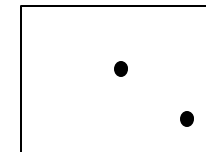
Bubble
Diameter

OR

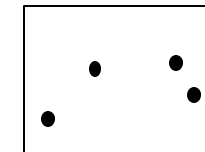
Glass Weight



Y1 = 12.2
Y2 = 11.1
Y3 = 13.3



Y1 = 12.2
Y2 = 12.2



Y1 = 12.2
Y2 = 11.1
Y3 = 13.3
Y4 = 13.3

Normal Distribution
or Other

Exercise: Which Type of Data Is It?

DIRECTIONS: Identify the type of data you would be collecting:

- **Discrete Type-I (Defective Items),**
- **Discrete Type-II (Defects), or**
- **Continuous Data**

- (1) Cycle time for a “Credit Check” process
- (2) Percent cream content in milk bottles (comes in four-bottle container sets)
- (3) Sales Hit Rate (Number of sales proposals that were won) reported each month
- (4) Number of defects per square yard of cloth, where pieces of cloth may be of variable size
- (5) Number of employee accidents per month
- (6) Proportion of orders that were late coming out of Sales Dept. in daily samples of 100 orders.
- (7) Percent defective parts in hourly production
- (8) Number of surface blemishes in four-piece sets of coffee cups
- (9) Length of screws in samples of size ten from production lots

ANSWERS

Exercise: Which Type of Data Is It?

DIRECTIONS: Identify the type of data you would be collecting:

- Discrete Type-I (Defective Items),
- Discrete Type-II (Defects), or
- Continuous Data (a.k.a. “Variables Data”)

- (1) Cycle time for a “Credit Check” process **Continuous**
- (2) Percent cream content in milk bottles (comes in four-bottle container sets) **Continuous
(weight or volume)**
- (3) Sales Hit Rate (Number of sales proposals that were won) reported each month **Discrete Type-I**
- (4) Number of defects per square yard of cloth, where pieces of cloth may be of variable size **Discrete
Type-II**
- (5) Number of employee accidents per month **Discrete Type-II**
- (6) Proportion of orders that were late coming out of Sales Dept. in daily samples of 100 orders. **Discrete
Type-I**
- (7) Percent defective parts in hourly production **Discrete Type-I**
- (8) Number of surface blemishes in four-piece sets of coffee cups **Discrete Type-II**
- (9) Length of screws in samples of size ten from production lots **Continuous**