2.1   Variables & Data

Goals:

Recognize variables as:

Qualitative   or   Quantitative

Discrete   Continuous

Study Ch. 2.1, # 1-5, 6(~7), 8(13)

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2.1   Variables & Data   Study Ch. 2.1, # 1-13

Variable: characteristic that varies from one individual to another in the population

1. Qualitative: value is NOT a number
   eg: hair color, type of battery, etc.

2. Quantitative: value IS a number
   eg: weight, height, minutes, etc.

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2.1   Variables & Data

2. Quantitative: value IS a NUMBER
        eg: weight, height, minutes, etc.

   a) Discrete: possible values can be listed (finite)
            eg: counts

   b) Continuous: possible values on an interval (not finite)
            eg: $60gm \leq NSWO\ mass \leq 110gm$

   > Statistical methods are designed with basic assumptions
   > which depend on the type of data
   > --> analyze qualitative data differently from continuous data

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2.1   Variables & Data

Saw-whets

qualitative or quantitative?

qualitative

_____

quantitative?

discrete_____

continuous_____

Broad-winged Hawks

type of variable?

y-axis?   _____

date   _____

dots (2014 data)   _____

_____

Species codes   _____
"Since 1971"

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2.2   Grouping Qualitative Data

Goals:
1. Organize data by grouping
2. Find frequencies and relative frequencies of groups
3. Construct a frequency distribution table
4. Graph the data to display groups for easy comparison

Study Ch. 2.2
#17(15), 19(17), 29a b d

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2.2   Grouping Qualitative Data   Study Ch. 2.2 #15-19, 23, 29

As the number of data items increases, we need a way to
1. organize and manage how we think about the data
2. determine how the data is distributed

4 regions in US (Census Bureau):
Northeast (NE), Midwest (MW), South (S), and West (WE)

Region by State

SO	WE	WE	MW	NE	WE	WE	SO	MW	SO
WE	NE	WE	SO	MW	MW	NE	WE	SO	WE
WE	SO	MW	SO	MW	WE	SO	NE	SO	SO
SO	SO	MW	NE	SO	NE	MW	NE	WE	MW
WE	SO	MW	SO	MW	NE	MW	SO	NE	WE

What can you tell from this data set without organization?

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2.2 Grouping Qualitative Data

4 regions in US (Census Bureau):
Northeast (NE), Midwest (MW), South (S), and West (WE)

Region by State

SO	WE	WE	MW	NE	WE	WE	SO	MW	SO
WE	NE	WE	SO	MW	MW	NE	WE	SO	WE
WE	SO	MW	SO	MW	WE	SO	NE	SO	SO
SO	SO	MW	NE	SO	NE	MW	NE	WE	MW
WE	SO	MW	SO	MW	NE	MW	SO	NE	WE

	TALLY	f	rel f
WE			
MW			
NE			
SO			

Relative Frequency Distribution:
Listing of distinct values and their
relative frequencies.
Relative frequency = $\dfrac{\text{Frequency}}{\text{No of Observations}}$

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=COUNTIF(E$2:N$6,"=WE")

2.2 Grouping Qualitative Data

4 regions in US (Census Bureau):
Northeast (NE), Midwest (MW), South (S), and West (WE)

Region by State

SO	WE	WE	MW	NE	WE	WE	SO	MW	SO
WE	NE	WE	SO	MW	MW	NE	WE	SO	WE
WE	SO	MW	SO	MW	WE	SO	NE	SO	SO
SO	SO	MW	NE	SO	NE	MW	NE	WE	MW
WE	SO	MW	SO	MW	NE	MW	SO	NE	WE

	TALLY	f	rel f
WE		13	0.26
MW		12	0.24
NE		9	0.18
SO		16	0.32

Relative Frequency Distribution:
Listing of distinct values and their
relative frequencies.
Relative frequency = $\dfrac{\text{Frequency}}{\text{No of Observations}}$

Frequencies show that there are more states in the southern region than in other regions, and ....

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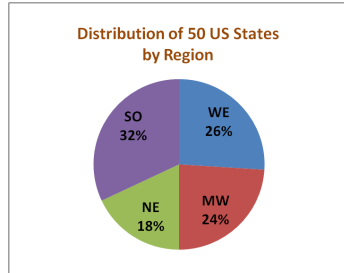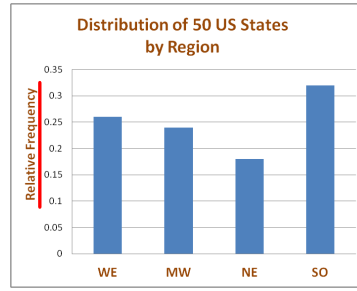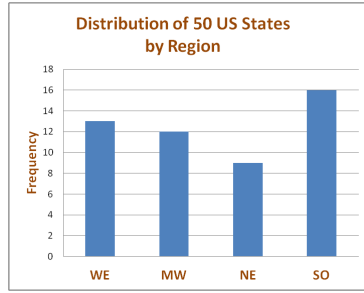
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=COUNTIF(E$2:N$6,"=WE")

2.2   Grouping Qualitative Data

Distribution of 50 US States by Region

Distribution of 50 US States by Region

Distribution of 50 US States by Region

- SO 32%
- WE 26%
- MW 24%
- NE 18%

Graphs: visual representation of the numbers

1. **South has most states**
2. **Northeast has the least**
3. **West and Midwest have about the same**

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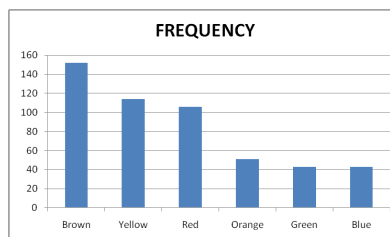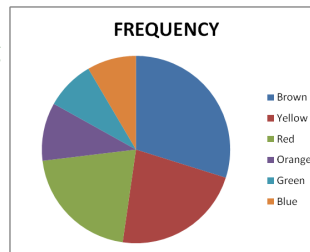

2.2   Grouping Qualitative Data

Qualitative Data: display using
1. Pie Chart, circle w proportions
2. Bar Graph, separate bars

m&m colors

COLOR	FREQUENCY
Brown	152
Yellow	114
Red	106
Orange	51
Green	43
Blue	43

FREQUENCY

- Brown
- Yellow
- Red
- Orange
- Green
- Blue

FREQUENCY

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