Chapter 2 Descriptive Statistics

2.1 Frequency Distributions

Characteristics of Data

- Center – A value that indicates where the _____ _____
- Variation – A measure of the amount that the _____ _____
- Distribution – The _____ or _____ of the data. EX: _____
- Outliers – Values that _____from the _____ of the data
- Time – How data _____

Frequency Distribution

- A table that shows the _____
- Breaks the data into _____
- Tells the _____ of data values in each category

Class	Frequency
41-50	1
51-60	2
61-70	6
71-80	8
81-90	14
91-100	9

- Lower class limits – _____in each class
- Upper class limits – _____ in each class
- Class width – _____ between two consecutive _____ or two consecutive _____
- Range – the _____ between the _____and _____ data entries

EX:

Class	Frequency
41-50	1
51-60	2
61-70	6
71-80	8
81-90	14
91-100	9

Constructing a Frequency Distribution

- 1) Determine _____ (between 5 and 20)

- 2) Find _____:
  - Find _____
  - Divide range _____
  - _____, if necessary

- 3) Find _____:
  - LCL = _____
  - _____ to determine the _____
  - Fill in _____ (make sure there is no overlap between classes)

- 4) Put a _____in the appropriate class for each _____.

- 5) _____ up marks to find the _____ of each class.

EX: Construct a frequency distribution for the following data:

- Cooking Blog Reading Times (in minutes per day)
- Classes: 5

7	39	13	9	25	8	22	0	2	18
2	30	7	35	12	15	8	6	5	29
0	11	39	16	15					

Additional Features of Frequency Distributions: Midpoint

- Midpoint of a Class =

Relative Frequency

- The _____, or _____, of the data that falls in that class.
- Note: Sum should be CLOSE to _____
- Relative Frequency =

Relative frequency table

Weight (in Kg.)	No. of persons (f_i)	Relative frequency
60 - 62	5	$\frac{5}{100}$ × 5% or 0.05
63 - 65	18	$\frac{18}{100}$ × 18% or 0.18
66 - 68	42	$\frac{42}{100}$ × 42% or 0.42
69 - 71	27	$\frac{27}{100}$ × 27% or 0.27
72 - 74	8	$\frac{8}{100}$ × 8% or 0.08
Total	$\Sigma f_i = 100$	

Cumulative Frequency

- The _____ of the frequencies of that _____ and _____.

Scores: 1,1,2,2,2,2,2,3,3,3,3,4,4,5

Score	Frequency	Cumulative Frequency
1	2	2
2	5	7
3	4	11
4	2	13
5	1	14

Cumulative Frequency for Score 3 is 2+5+4 = 11

EX: Expanded Frequency Distribution

Class	Frequency, f	Midpoint	Relative frequency	Cumulative frequency
7 – 18	6	12.5	0.12	6
19 – 30	10	24.5	0.2	16
31 – 42	13	36.5	0.26	29
43 – 54	8	48.5	0.16	37
55 – 66	5	60.5	0.1	42
67 – 78	6	72.5	0.12	48
79 – 90	2	84.5	0.04	50
	$\sum f = 50$		$\sum \frac{f}{n} = 1$	

EX: Find the midpoint, relative frequency, and cumulative frequency of each class.

Class	Frequency
41-50	1
51-60	2
61-70	6
71-80	8
81-90	14
91-100	9

Frequency Histogram

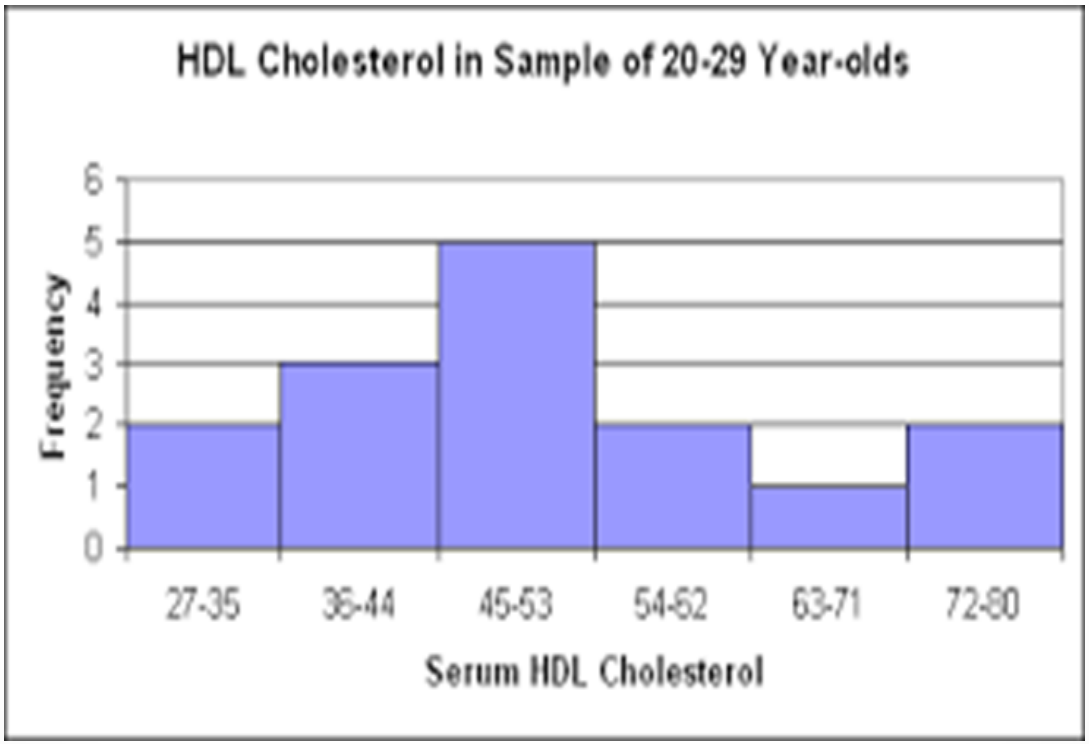
- _____ of a frequency distribution.
- Contains bars of _____.

- Horizontal scale – classes separated by _____ _____
  - **The number directly between _____ and the _____**

- Vertical scale – _____
  - _____ of bars correspond to _____

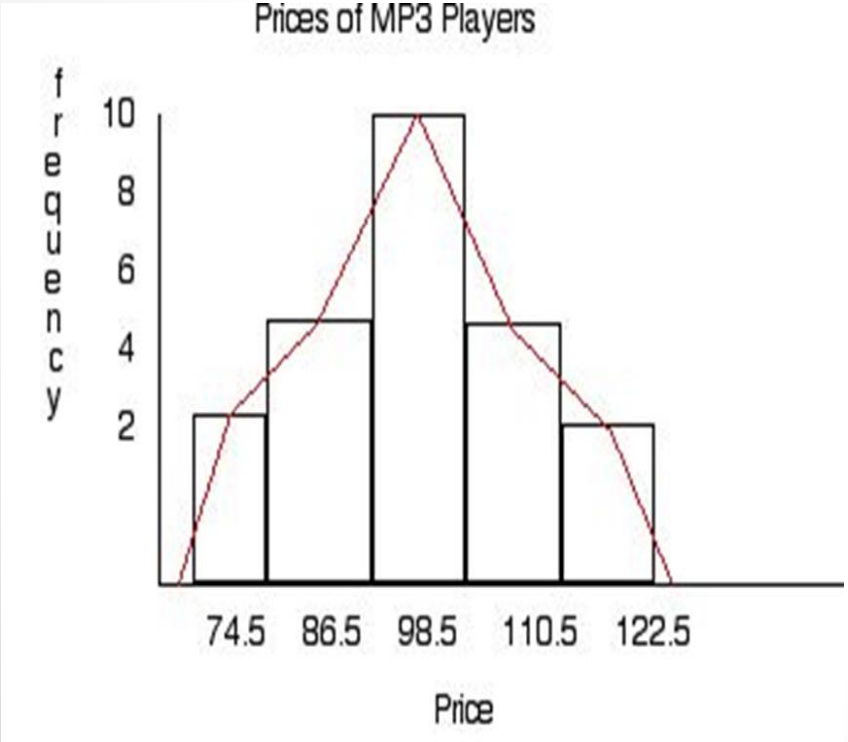
Frequency Histogram

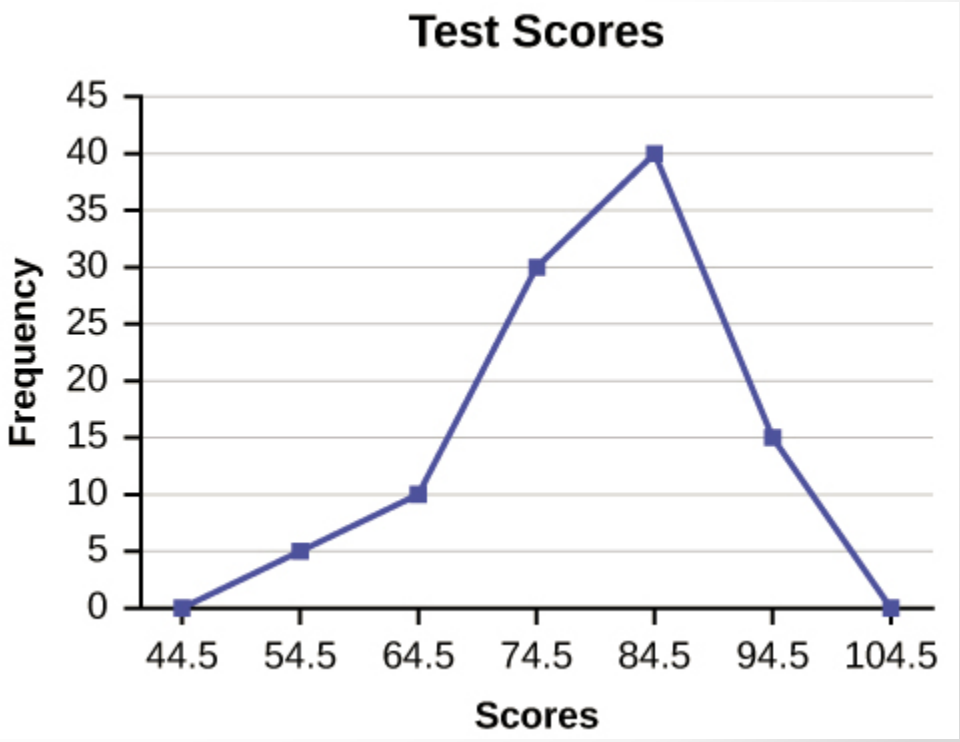
- EX:



Frequency Polygon

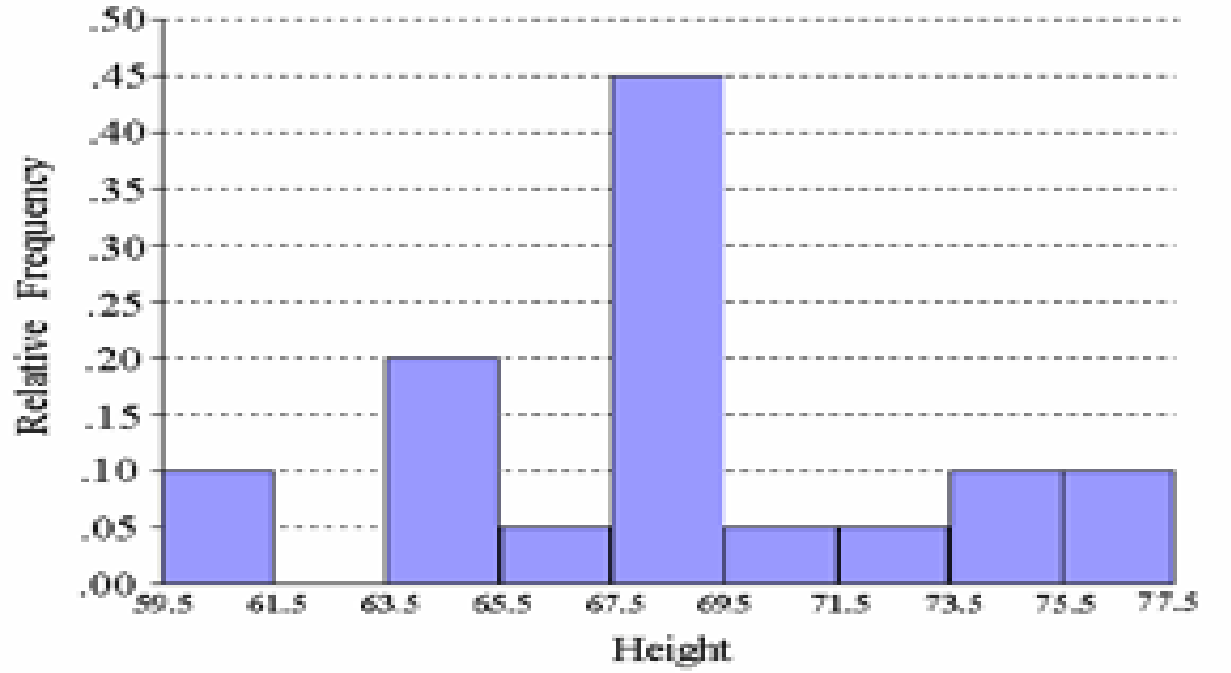
- _____connected to _____
  - Emphasizes the _____ in frequencies





Relative Frequency Histogram

- Vertical scale measures the _____, not _____.

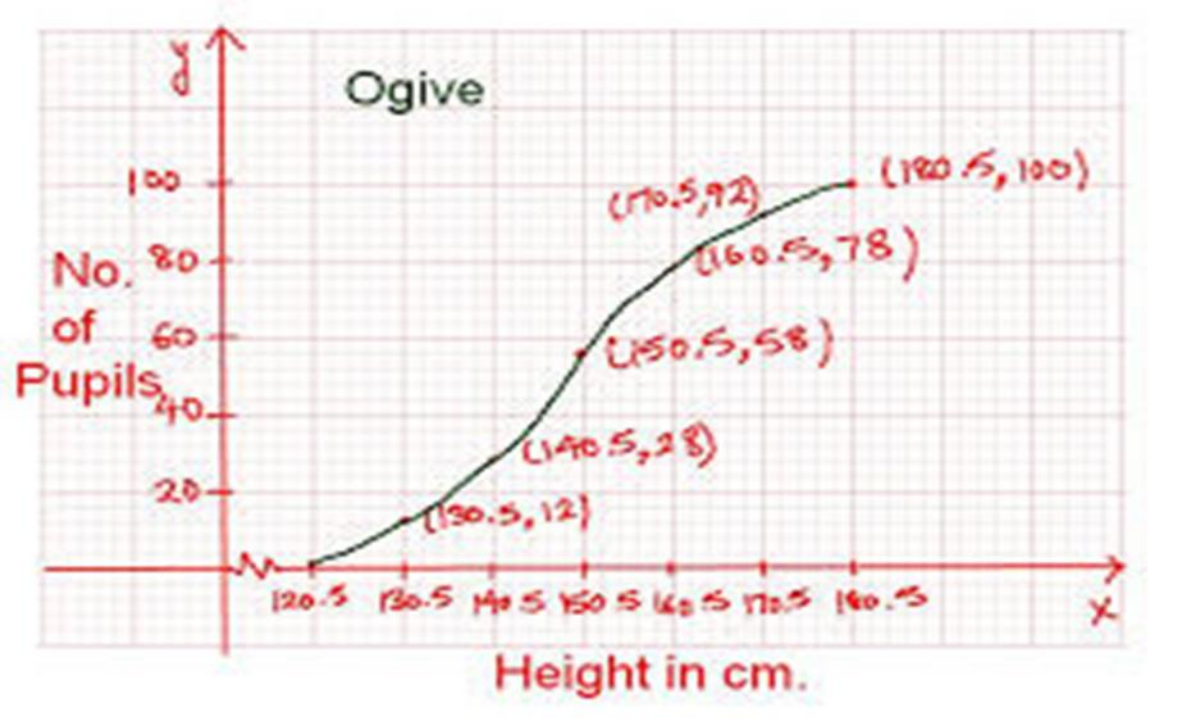


Ogive

- A _____ that displays the _____ of each class at its _____
  - Horizontal axis– label _____
  - Vertical axis– label _____

Ogive

- EX:


Ogive
No. of Pupils
100
80
60
40
20
(130.5, 12)
(140.5, 28)
(150.5, 58)
(160.5, 78)
(170.5, 92)
(180.5, 100)
120.5
130.5
140.5
150.5
160.5
170.5
Height in cm.

EX:

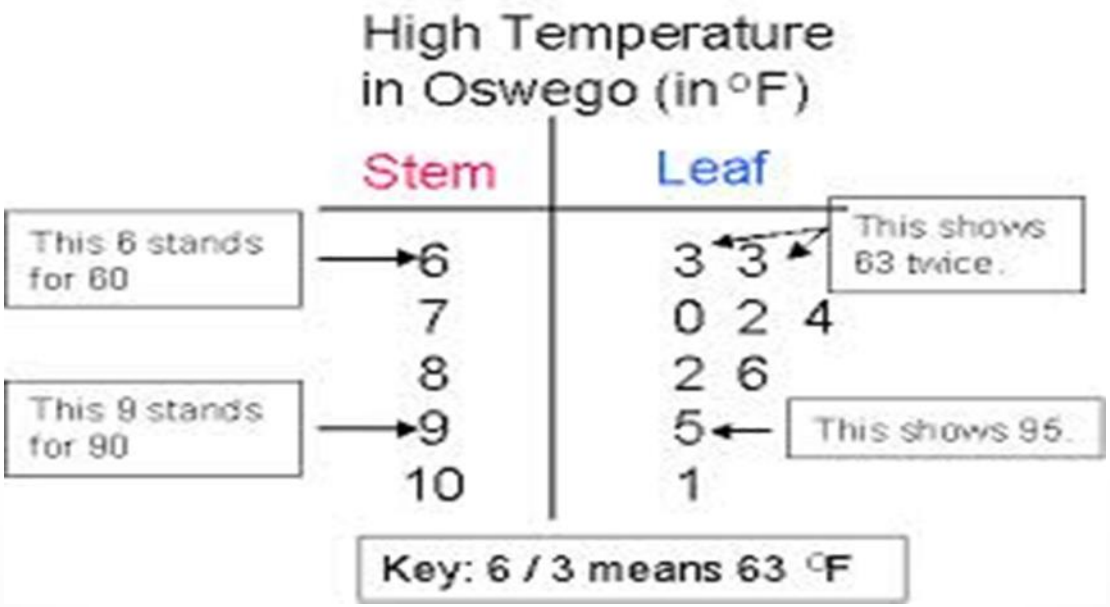
- Textbook p.52 #31, 35, 39, 41

2.2
More Graphs and Displays

Stem-and-Leaf Plot

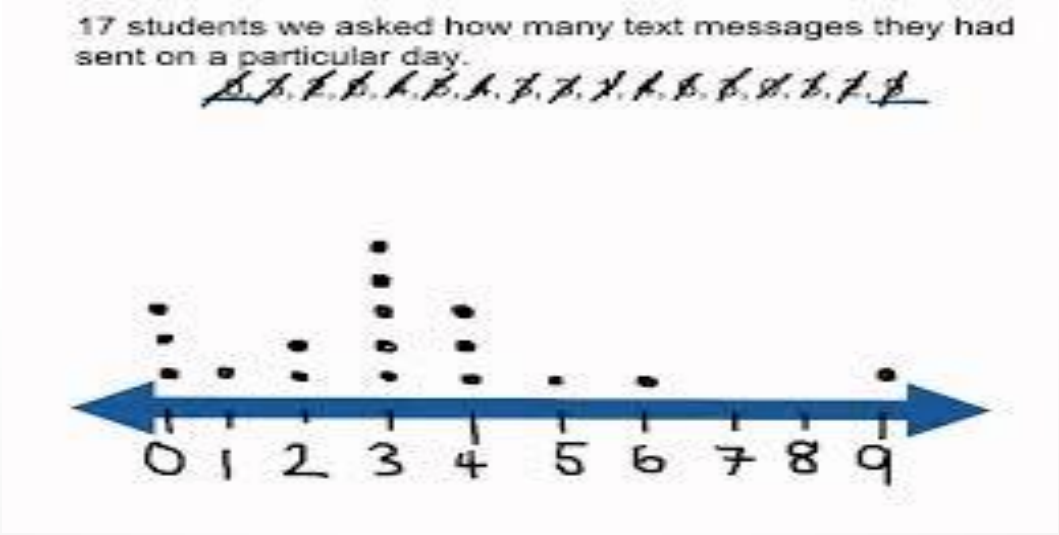
- Separates value into _____:
  - Stem – _____
  - Leaf – _____
- Benefits –shows _____ and _____ data

Stem-and-Leaf Plot



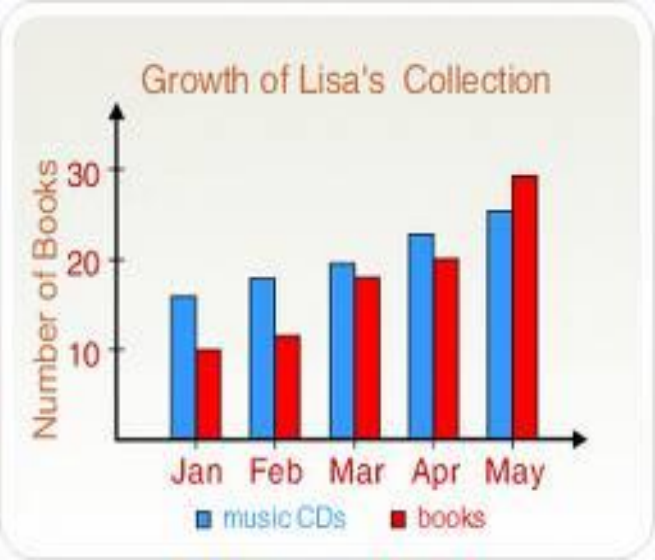
Dotplots

- A graph in which _____ as a _____ along a scale of values
- Benefits - Shows _____, _____, and easily identifies _____



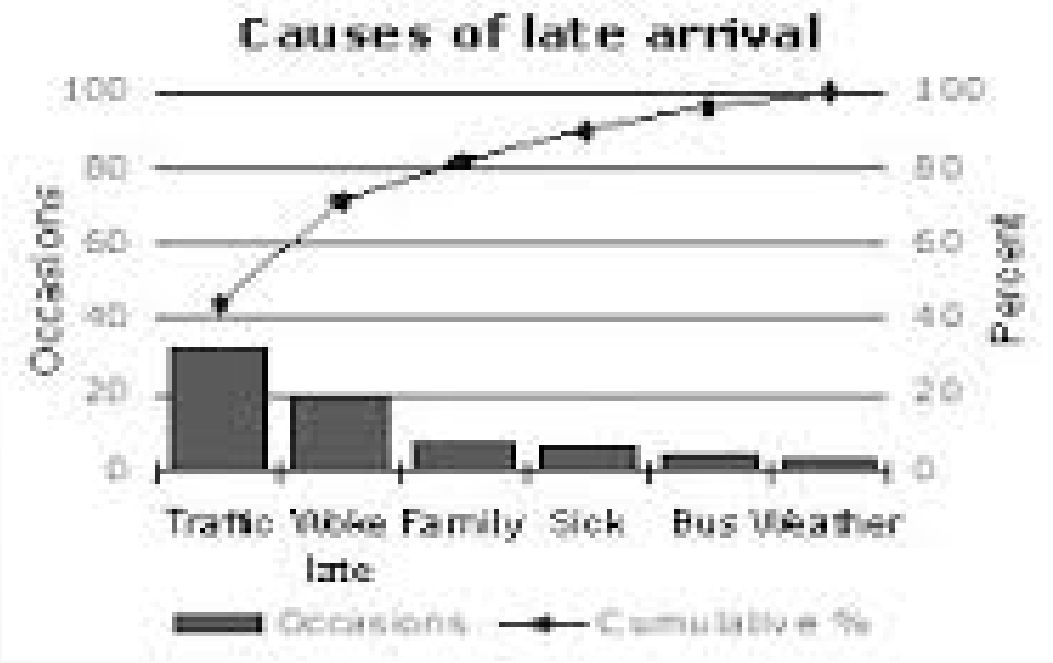
Bar Graphs

- Uses _____ to show _____ of categories of _____
  - Horizontal – label _____
  - Vertical – label _____



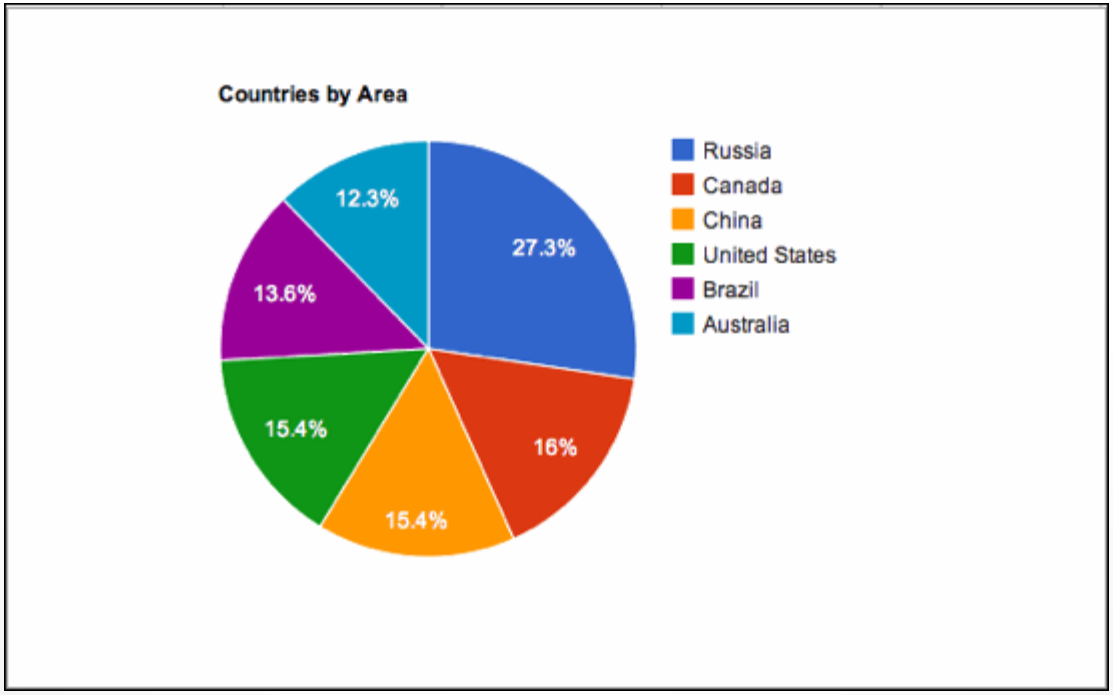
Pareto Charts

- Bar graph in which the bars are _____ _____



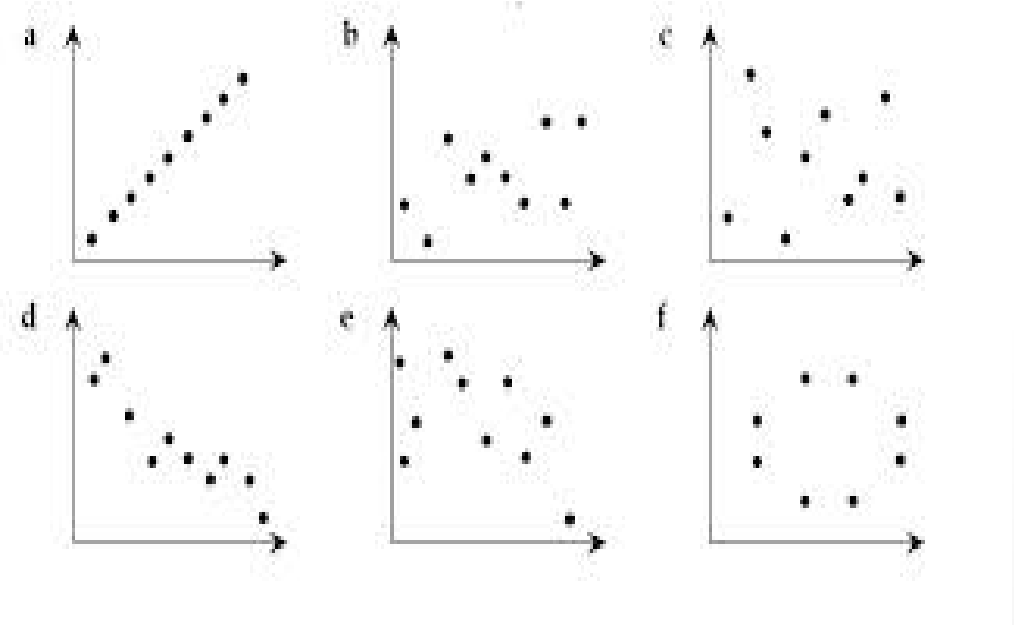
Pie Charts

- A graph that shows qualitative data as _____ _____
  - _____ of slice is proportional to _____



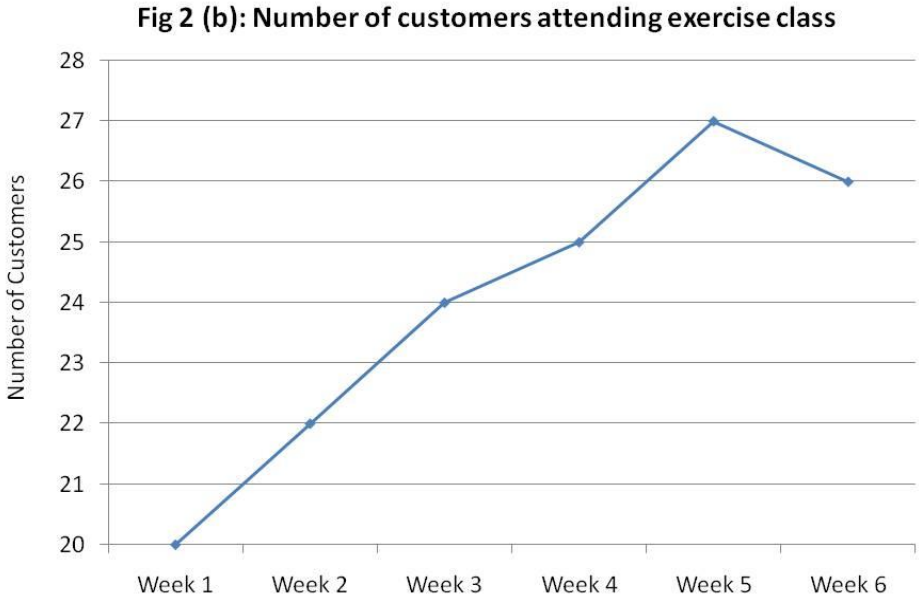
Scatterplot

- A plot of _____ quantitative data
  - X _____
  - Y _____
  - Shows _____ in data



Time-Series Chart

- A graph of quantitative data that have been collected at _____ over a _____



EX:

- Textbook p.62 #17, 23, 25, 27, 29, 31

Bad Graphs

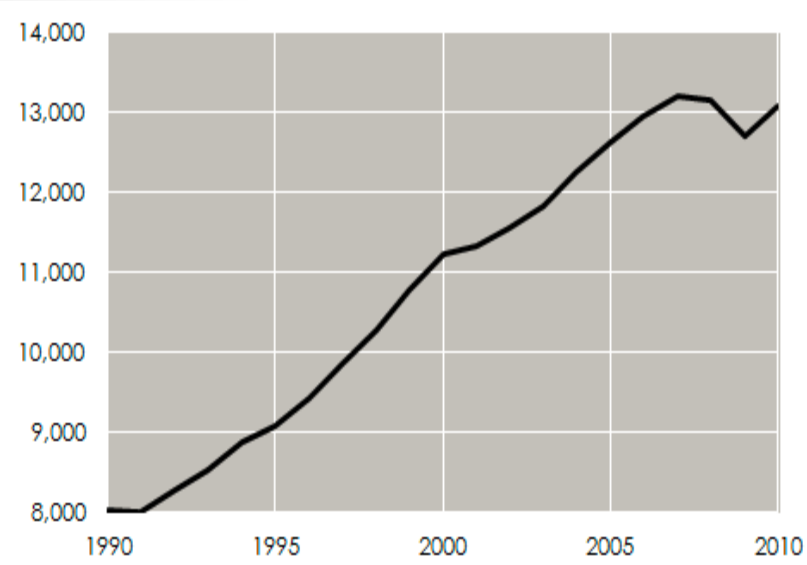
- Contain _____
- _____

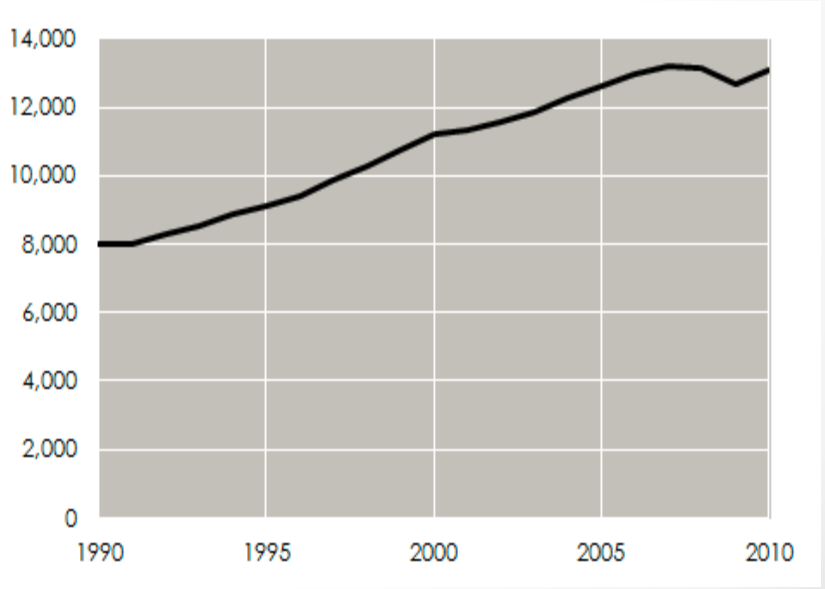
Common Misleading Graphs

- Nonzero axis – one or both axes _____

  _____

  - Exaggerates differences





- Pictographs – _____of objects
  - Artists can create false impressions by _____