Stat 104 – Lecture 2

Single Variable Data

- Categorical (Qualitative).
  - Display – Circle graph, bar graph, Pareto diagram.
- Numerical (Quantitative).
  - Display – dot plot, stem and leaf, histogram, box plot.
  - Summary – center, spread, position.

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Data

- Who?
  - Carnivores.
- What?
  - Family/species, Body mass, Bite force, Diet.

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Categorical (Qualitative)

Family	Number of Species	Percentage
Canidae	28	18.5%
Felidae	33	21.9%
Herpestidae	13	8.6%
Hyaenidae	4	2.6%
Mustelidae	38	25.2%
Procyonidae	10	6.6%
Ursidae	8	5.3%
Viverridae	17	11.3%
Total	151	100%

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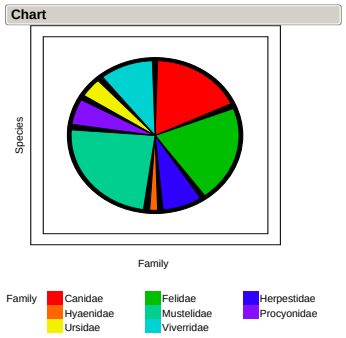
Circle Graph (Pie Chart)



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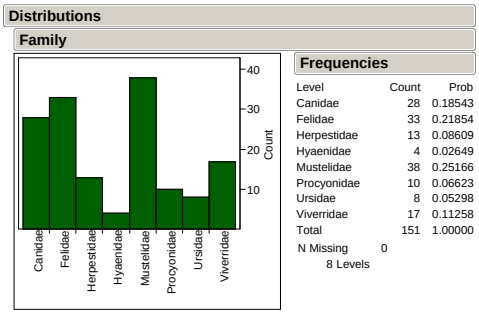
Bar Graph



Frequencies

Level	Count	Prob
Canidae	28	0.18543
Felidae	33	0.21854
Herpestidae	13	0.08609
Hyaenidae	4	0.02649
Mustelidae	38	0.25166
Procyonidae	10	0.06623
Ursidae	8	0.05298
Viverridae	17	0.11258
Total	151	1.00000
N Missing	0	
8 Levels		

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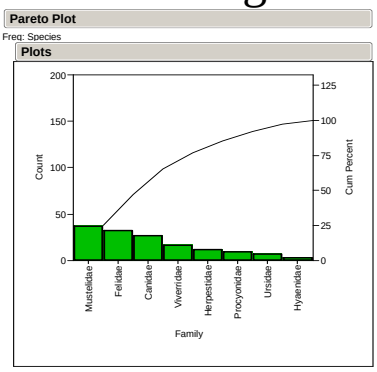
Pareto Diagram



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Numerical (Quantitative)

Body Mass of *Canidae*
(rounded to nearest kg)

5, 10, 10, 9, 25, 11, 36,
9, 7, 23, 13, 1, 4, 22,
5, 5, 12, 6, 6, 6, 5,
4, 4, 5, 3, 3, 3, 8

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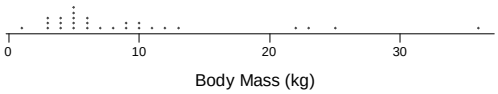
Dot Plot of Body Mass



Body Mass (kg)

Stem-and-Leaf Display

Body Mass (kg) of *Canidae*

0 | 1,3,3,3,4,4,4,5,5,5,5,5,6,6,6,7,8,9,9
1 | 0,0,1,2,3
2 | 2,3,5
3 | 6
4 |

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Display of Numerical Data

- Histogram
  - A picture of the distribution of the data.
  - Collects values into intervals.
  - Intervals should be of equal width.
  - Different choices for intervals can yield different pictures.

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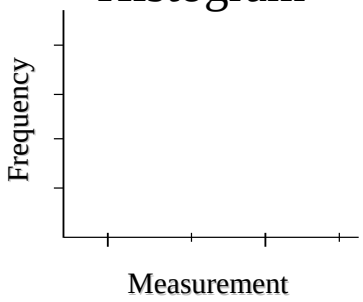
Histogram



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Constructing a Histogram

- Order data from smallest to largest using a stem and leaf display.
- Determine intervals.
  - equal width
  - more data ⇨ more intervals

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Split Stem

Body Mass (kg) of *Canidae*

```
0  | 1,3,3,3,4,4,4
0*| 5,5,5,5,5,6,6,6,7,8,9,9
1  | 0,0,1,2,3
1*|
2  | 2,3
2*| 5
3  |
3*| 6
```

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Interval	Freq
0 ≤ Body Mass < 5	7
5 ≤ Body Mass < 10	12
10 ≤ Body Mass < 15	5
15 ≤ Body Mass < 20	0
20 ≤ Body Mass < 25	2
25 ≤ Body Mass < 30	1
30 ≤ Body Mass < 35	0
35 ≤ Body Mass < 40	1

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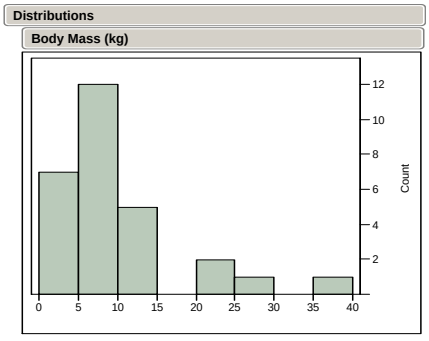
Histogram



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Shape

- Symmetry (mirror image)
  - Mounded, flat
- Skew (mounded on one side – skewed to the other side)
  - Toward higher values (right)
  - Toward lower values (left)
- Other
  - Multiple peaks, outliers

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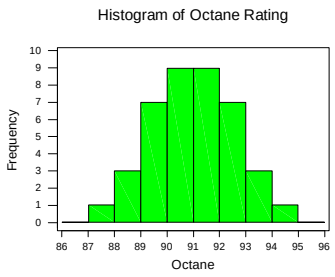
Symmetric, Single Mound



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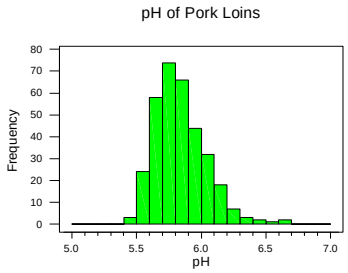
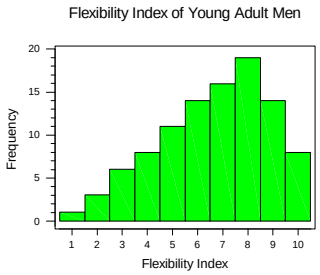
Skewed to Right



18

Skewed to Left



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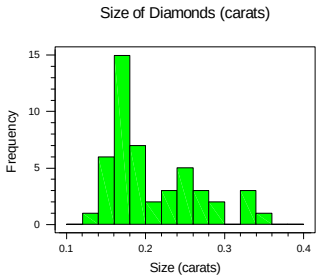
Multiple Peaks



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Summarizing Numerical Data

- What is a “typical” value?
- Look for the center of the distribution.
- What do we mean by “center”?

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