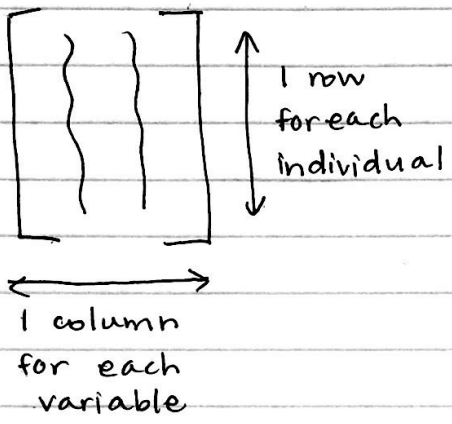
* HW 1 now due 4/20/18 @ 11:59 pm

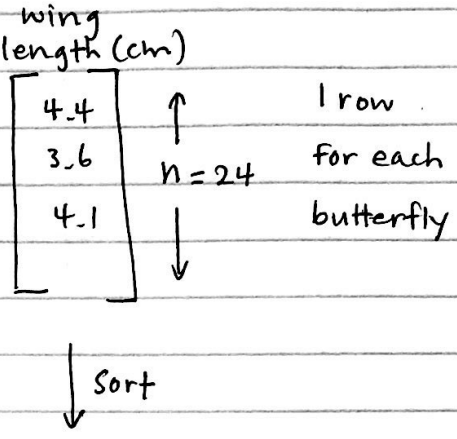
this time : variable types ; histograms

next time : center & spread; normal curve

- ratio - scale
  - unique true zero on measurement scale w/ direct physical meaning
  - constant size interval

$°K = \frac{9}{5}°C + 32°$

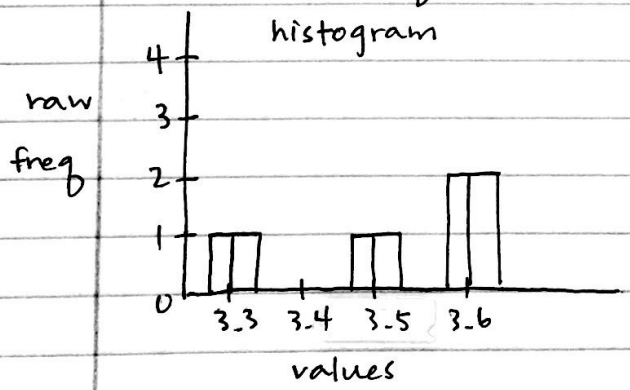




Raw Frequency Distribution

wing length (cm)	raw frequency
3.3	1
3.4	0
3.5	1
3.6	2
⋮	⋮
4.5	+ 1
	n = 24

(raw freq) histogram



wing length (cm)
- qualitative
- continuous
- ratio

* not a histogram
← bar graph

site

LTB
BE
LTB
TBC
⋮

1 row for each nest

- qualitative
- nominal
- not dichotomous
- no histogram
- bar graph

amount of pigmentation

FS
HS
⋮

1 row for each sunfish

- qualitative
- ordinal
- not dichotomous
- no histogram ; bar graph

# of pups

4
6
5
⋮

1 row for each litter

- quantitative
- discrete
- ratio
- histogram yes

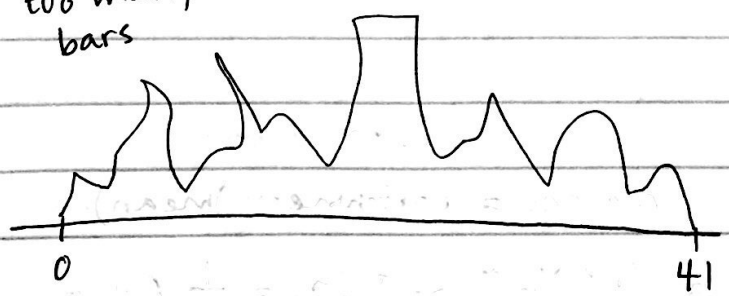
# of aphids

21
14
33
⋮

1 row for each clover plant

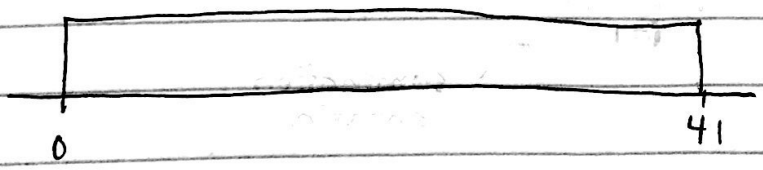
- quantitative
- discrete
- ratio
- histogram

too many bars



* bad, too jumpy

too few bars



* bad, all shape info lost

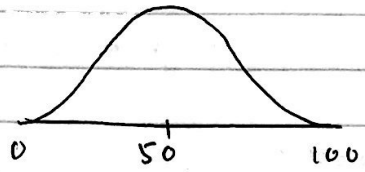
phosphorus concentration

8.63
9.14
⋮

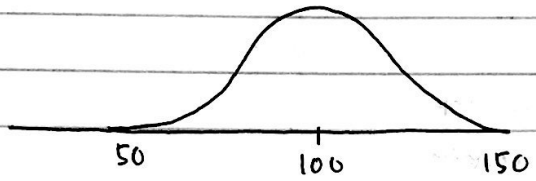
1 row for each leaf

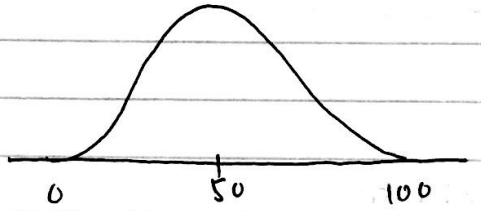
- quantitative
- continuous
- ratio
- histogram

Numerical Descriptive Methods

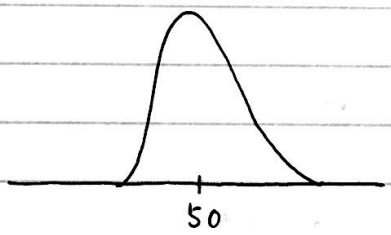


- same shape
- same spread
- different center





- same shape
- same center
- different spread



y "y sub 1"

$$\begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_n \end{bmatrix} \quad n$$

average = (arithmetic) mean

$$\bar{y} = \frac{y_1 + y_2 + \ldots + y_n}{n} = \frac{1}{n}(y_1 + y_2 + \ldots + y_n)$$

$$= \frac{1}{n}\sum_{i=1}^{n} y_i$$

summation notation

mode →