HW due Wed

↖ 15 MCQ on AP classroom

Takeaway from last time

① Give context in your answers

② Label your variables

Describing big data / distributions

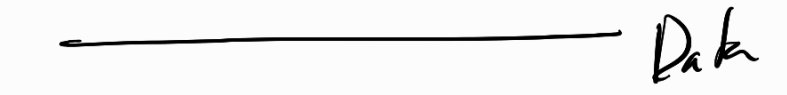
Shape:
- uniform
- bell-shape
- symmetric
- skew
- how many modes? ← unimodal, bimodal, trimodal

Outliers: "weird" data point

Center

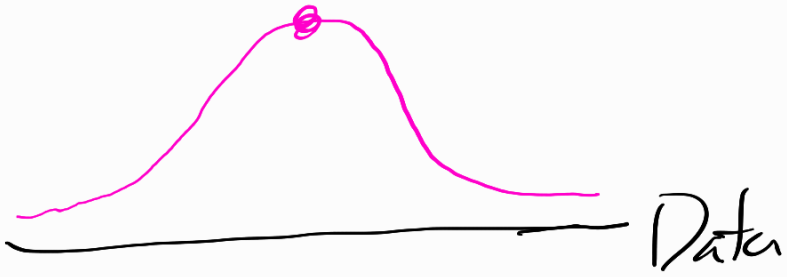
Spread

Shape: uniform

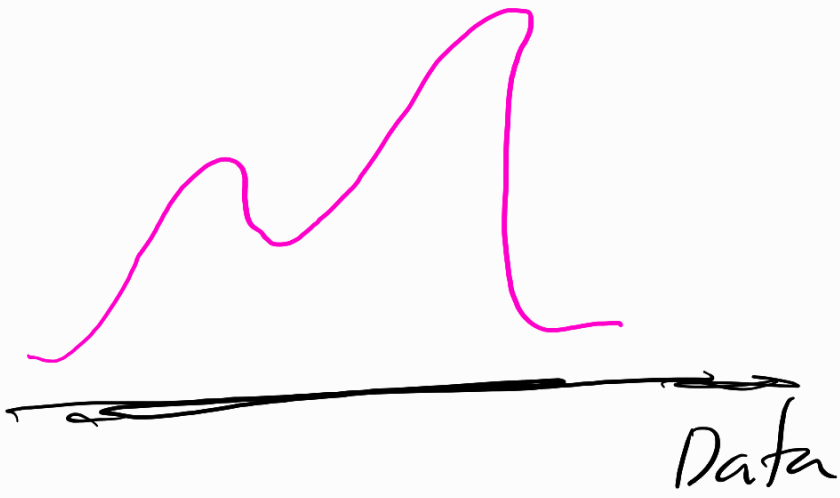


bell-shape

- symmetric
- unimodal

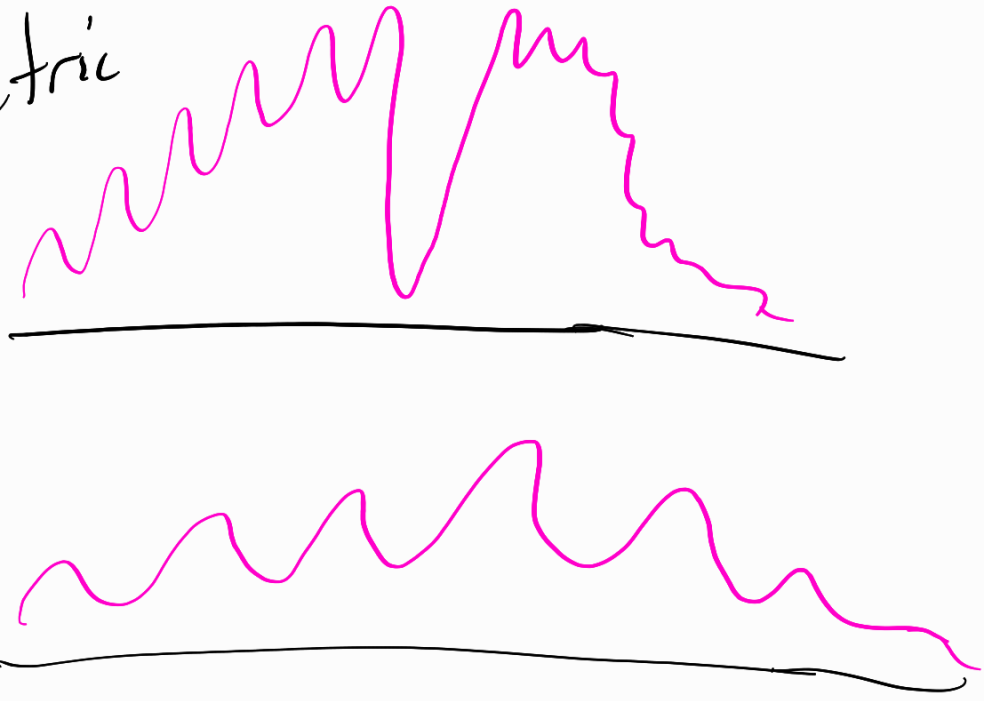


bimodal



unimodal skew

Symmetric



Outliers ① 1.5 × IQR rule

② more than 2 SD
(for bell-shaped curves)

$$IQR = Q_3 - Q_1$$

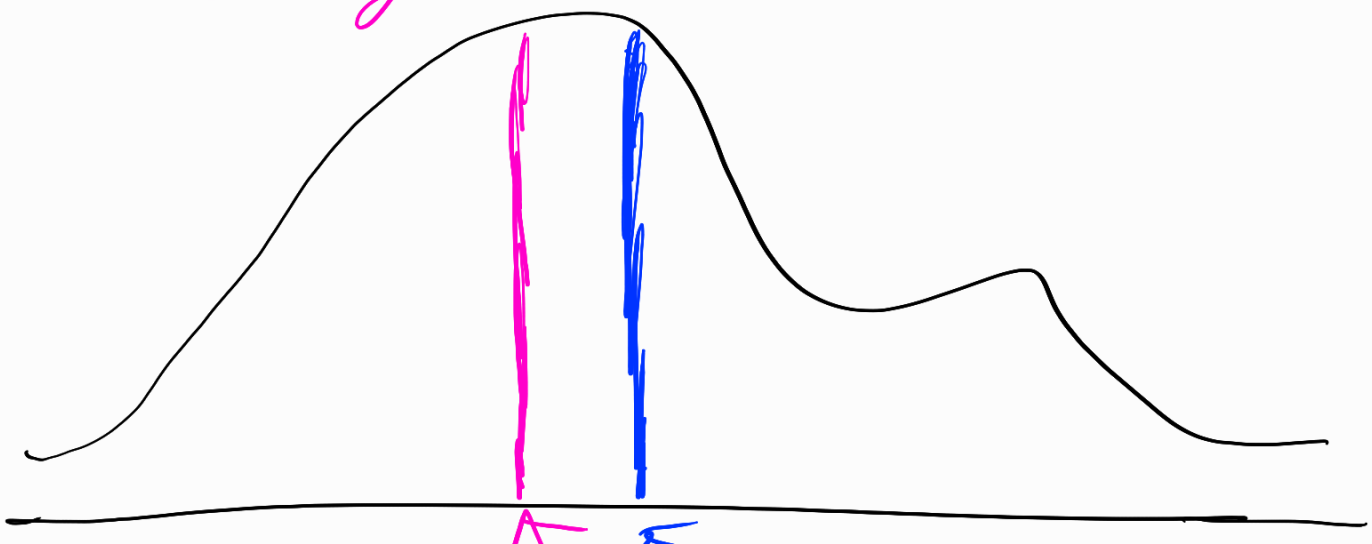
Q_3: median of top 50% of data

Q_1: median of bottom 50% of data

median process 3x

Center: ⟷ Spread

- median ← # of middle
- mean, if possible!
  - average

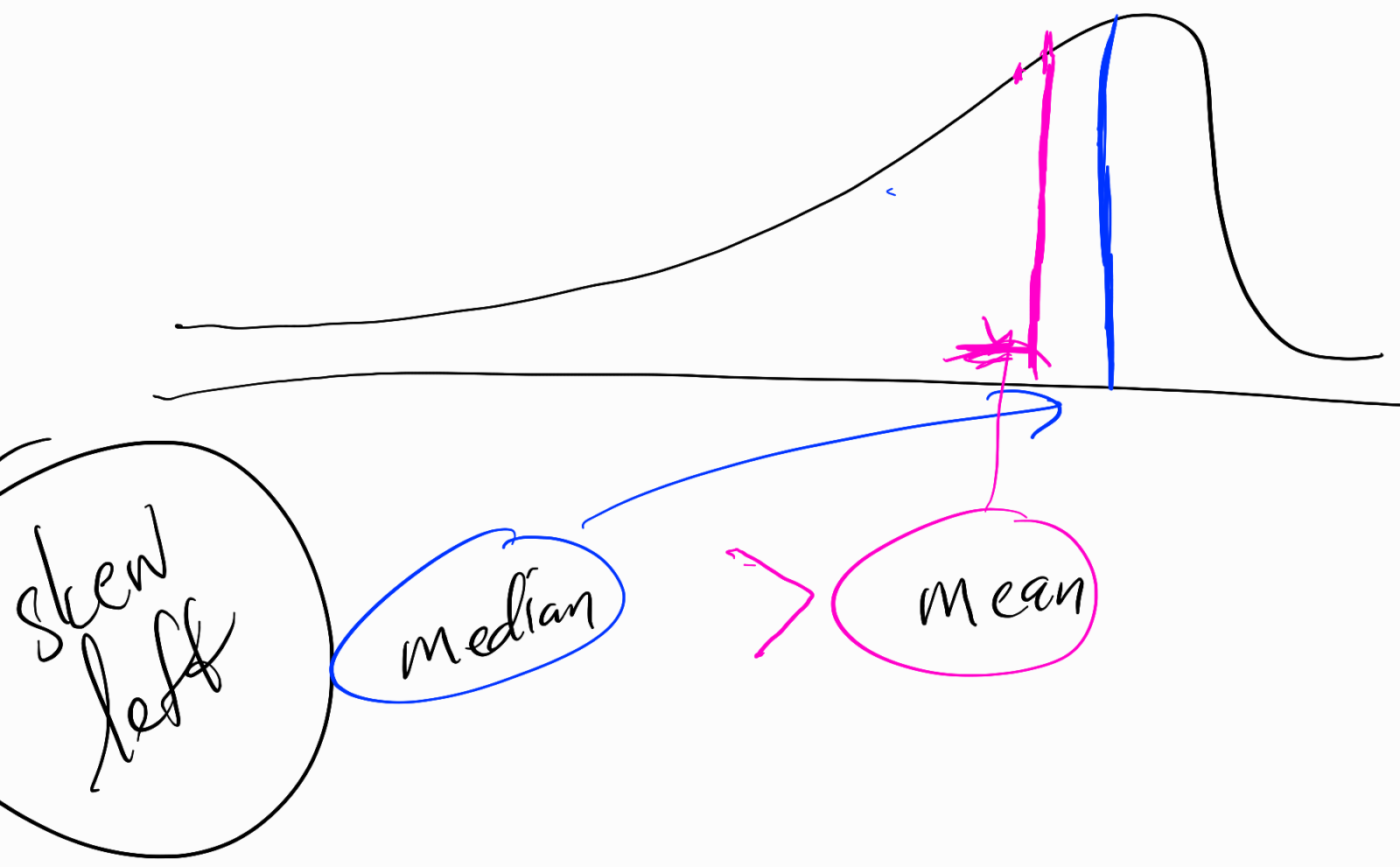


skew right

median < mean

- median: pt that makes 1/2 of area
- mean: center of gravity

of graph



skew left

median > mean

Spread ① range : max − min

$Q_4 - Q_0$

② Standard Deviation ←→ variance

Some formulas:

data set

$E(X)$ = expected value of X

"mean"

$X = \{x_1, x_2, \ldots x_n\}$

$$E(X) = \frac{\sum_{i=1}^{n} x_i}{n}$$

hit every member in X

$X = \{3, 7, 5, 9, 4, 8, 2\}$

$$\frac{3+7+5+9+4+8+2}{}$$

$$E(X) = \bar{X} = \frac{\text{sum}}{7}$$

$$= \frac{38}{7}$$

std dev.

$$\sigma = \sqrt{\frac{\sum_{x \in X} (x - \bar{X})^2}{n}}$$

hit every # in X

$$VAR(X) = \text{①}\ (5 - \tfrac{38}{7})^2 + (7 - \tfrac{38}{7})^2 +$$

$$(5 - \tfrac{38}{7})^2 + (9 - \tfrac{38}{7})^2 +$$

$$\cdots + (8 - \tfrac{38}{7})^2 + (2 - \tfrac{38}{7})^2$$

② Divide result by $n = 7$

then you have

VAR(X)

(3) to get S.D. you

$$S.D. = \sqrt{VAR(X)}$$