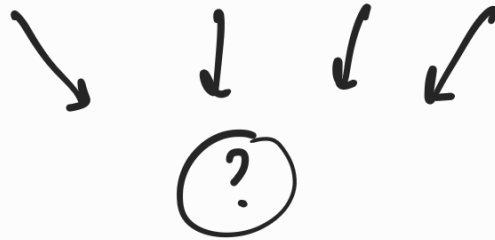


MEASURES OF CENTRAL TENDENCY

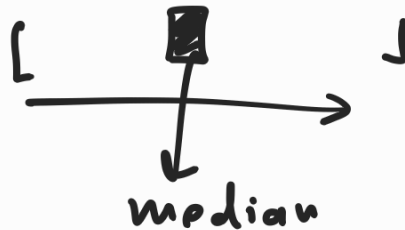
✓ [... ..]
 $x_1, x_2, x_3, x_4, \dots, x_n$



Mean

Median

Mode



max rep

$\bar{X} \rightarrow$ POINT ESTIMATES

Sample statistics

Population statistics

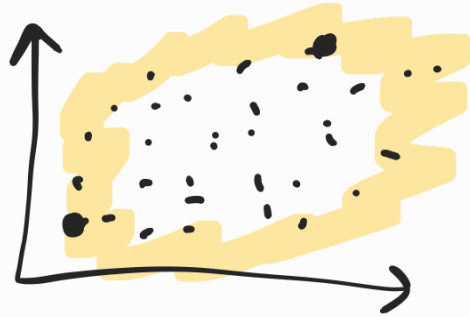
Latin

Creek

\bar{x}

μ

MEASURES OF SPREAD



RANGE
min, max

Variance
 $\frac{1}{n} \sum (x_i - \bar{x})^2$
[σ^2]

Standard Deviation
sqrt (variance)
[σ]
{ 0, 1, 1, 3, 100 }

IQR

[.]

↳ sort in ASC order

[[[IQR]]]
0% 25% 50% 75% 100%

ROBUSTNESS

A ROBUST measure: NOT AFFECTED
BY OUTLIERS

Median $>$ mean

IQR $>$ standard deviation $>$ Range

SCALING

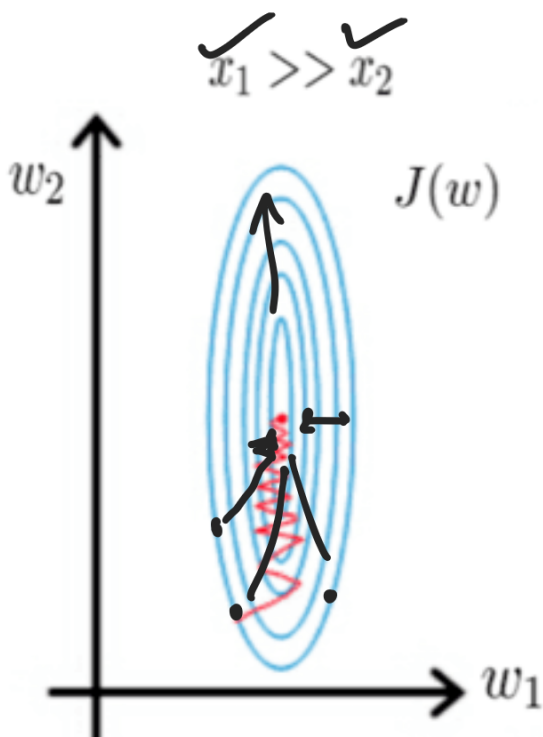
$$F(d) \rightarrow d'$$

\hookrightarrow [RANGE]

$$\begin{bmatrix} \checkmark & \checkmark & \checkmark \\ v_1 & v_2 & v_3 \\ 0 & 25 & 1000 \\ 100 & 75 & 3000 \end{bmatrix} \xrightarrow{f} \begin{bmatrix} v_1 & v_2 & v_3 \\ 0 & 0 & -1 \\ 1 & 1 & 1 \end{bmatrix}$$

$$y = w x + b$$

Gradient descent
without scaling



Gradient descent
after scaling variables

$$[0, 1]$$

$$0 \leq x_1 \leq 1$$

$$0 \leq x_2 \leq 1$$

