② Location

mean – average

median – middle

mode – most freq

Mean:

pop vs. sample

$\mu$ vs. $\overline{X}$

$$\frac{[x_1 + x_2 + \cdots + x_N]}{N} = \sum_{i=1}^{N} \frac{x_i}{N}$$

$\overline{X} = 29°$

Temps: $8°, 42°, 17°, 68°, -10°, 3°, 75°$

Median:

King County, WA

Seattle

$\overline{X} = \$225K$

Mike Knight
Jeff Bezos
Bill Gates

$\$ 10 \, bz$

med $= \$89K$

Mode (most)

green
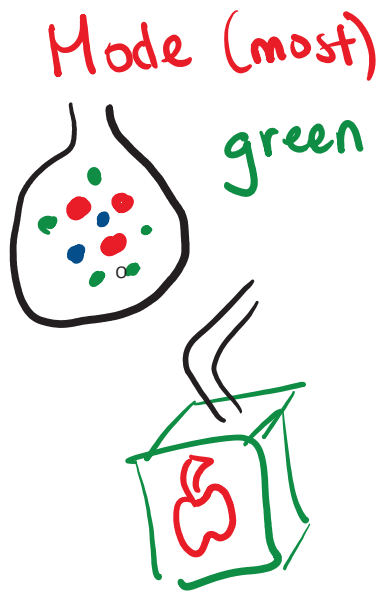
Party Avg Age $\approx$ 21 yrs old

tequila, keg, everclear, etc.

$\{4, 5, 6, 7, 8, 9, 66, 66\}$  $\bar{x} \approx 21$

mode = 6

mode = 66

③ Spread: $\begin{cases} \text{max : largest} \\ \text{min : smallest} \\ \text{range} = \text{max} - \text{min} \end{cases}$

standard deviation

→ (avg distance from mean)

$(\sigma, s)$
pop  samp
↑    ↑

$$\sqrt{\sum_{i=1}^{n} \frac{(x_i - \bar{x})^2}{n-1}} = S$$

$(x_1 - \mu)^2 \ (+)^2 \Rightarrow (+)$

$(x_2 - \mu)^2 \ (-)^2 \Rightarrow (+)$

$(x_3 - \mu)^2 \ (-)^2 \Rightarrow (+)$

$\vdots$

$(x_N - \mu)^2 \ (+)^2 \Rightarrow (+)$

$$\sum \frac{(x_i - \mu)^2}{N} \Rightarrow \text{variance} = \sigma^2$$

$$\sqrt{\sum \frac{(x_i - \mu)^2}{N}} \Rightarrow \text{std dev} = \sigma$$