

Week 3

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A **variable** is an empirical measurement of a characteristic.
(*Remember the characteristics that were the essence of the concepts we were interested in?*)

Variables have two features:

- ▶ Name – what we use to refer to the variable (Age, Married?, var_1)
- ▶ Values – what we are interested in. **NOTE:** is must have 2 values. Otherwise, it's a constant!

Describing Variables

Central Tendency:

- ▶ Mean: $(\frac{1}{N}) \sum_{i=1}^N x_i$
- ▶ Median: Choose $(\frac{N}{2})$ from Ordered Set
- ▶ Mode: Maximally occurrent observation. Useful for nominal-level variables.

Dispersion:

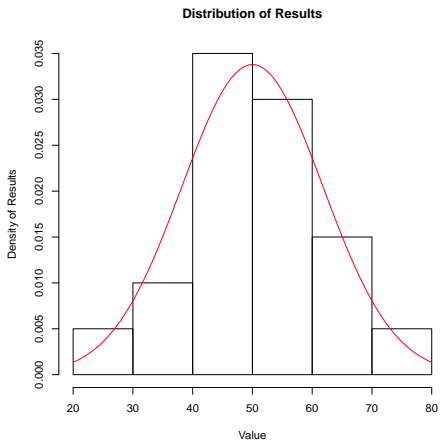
- ▶ Ordinal: Comparison of Median and Mode
- ▶ Interval and Ratio: Variance

Variance:
$$\sigma^2 = \frac{\sum_{i=1}^N (x_i - \bar{x})^2}{n}$$

Standard Deviation:
$$\sigma = (\sigma^2)^{\frac{1}{2}}$$

Wednesday Lecture

How many times did you guys see these graphs?



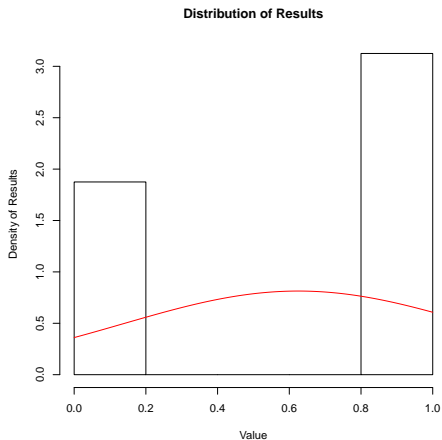


Figure: Random Draws from a Binomial Distribution

x_i	$x_i - \bar{x}$	$(x_i - \bar{x})^2$
1	-4	16
2	-3	9
3	-2	4
4	-1	1
5	0	0
6	1	1
7	2	4
8	3	9
9	4	16
	Sum	60

	$\sigma^2 =$	$\frac{55}{8}$
	$\sigma =$	$\left(\frac{55}{8}\right)^{\frac{1}{2}}$
		2.73