Example

SAT scores follow Normal $(1100, 200)$. What percent of SAT takers get between 1100 and 1400?

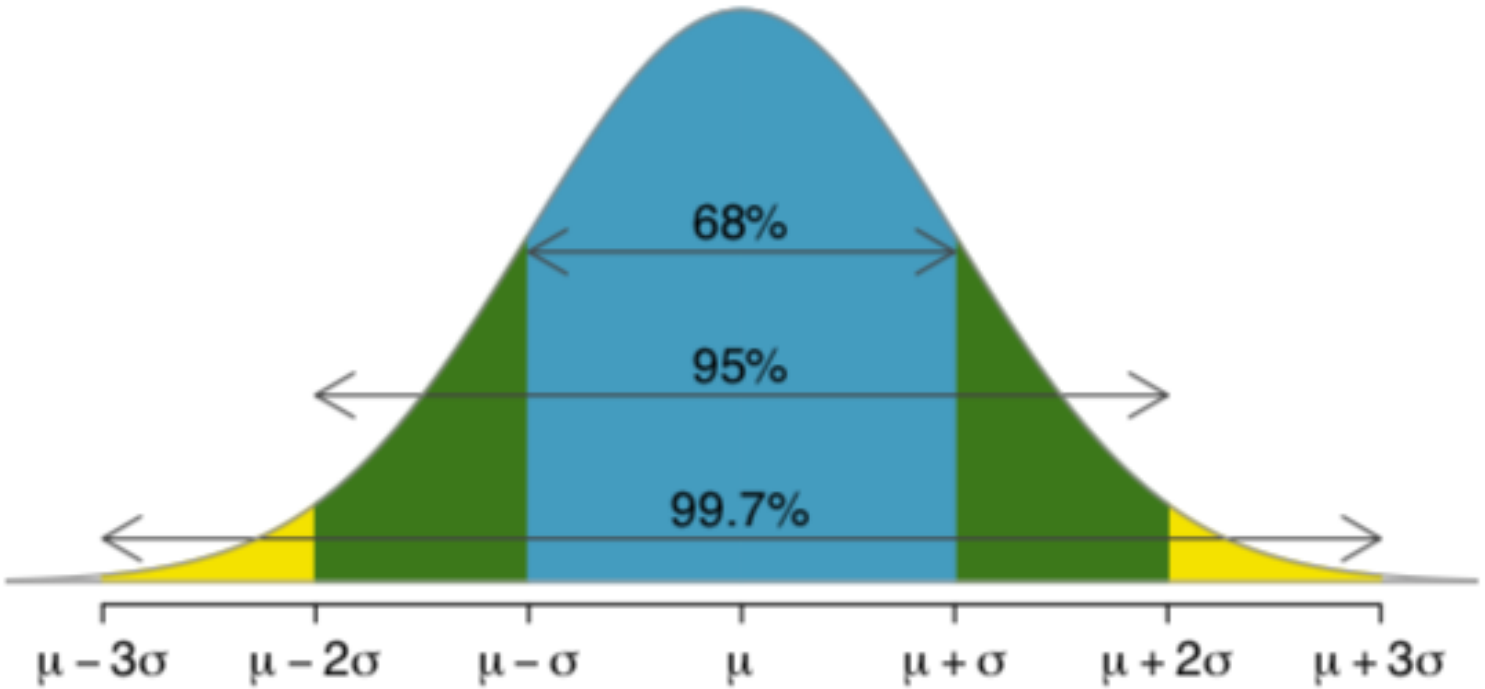
The Empirical Rule

The Empirical Rule is a good general rule for thinking about the normal distribution.

- 68% of the observations will fall within 1 standard deviation of the mean
- 95% of the observations will fall within 2 standard deviations of the mean
- 99.7% of the observations will fall within 3 standard deviations of the mean

This can be useful when trying to make a quick Z-score estimate without access to software.

The Empirical Rule



Example

Edward earned a 1030 on his SAT. What is his percentile?

Percentiles

- We've talked about finding a percentile based on an observation.
- Now we want to think about finding the observation corresponding to a particular percentile.

Example: Percentiles

Based on a sample of 100 men, the heights of male adults in the US is nearly normal with mean 70.0" and standard deviation 3.3".

Erik's height is at the 40th percentile. How tall is he?

Example: Percentiles

What is the adult male height at the 50th percentile?

As always, we begin by drawing our picture.

The 50th Percentile

- When we talked about measures of center, we noted that the 50th percentile is the median.
- Because the normal distribution is *symmetric*, the mean and median will be equal.
- This means that for the normal distribution the 50th percentile will always be μ.