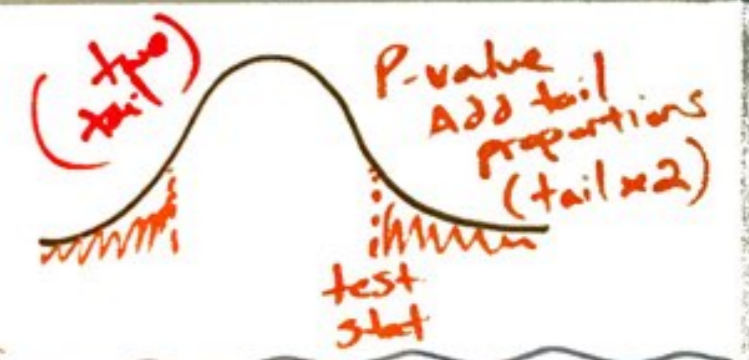


# Hypothesis Tests Calculating P-Value

Def: P-value  
The probability of getting the Sample data (Sample statistic) or more extreme by Sampling Variability if the null hypothesis is true.

Traditional P-value Calculations  
(Test Statistics + Theoretical Distributions)

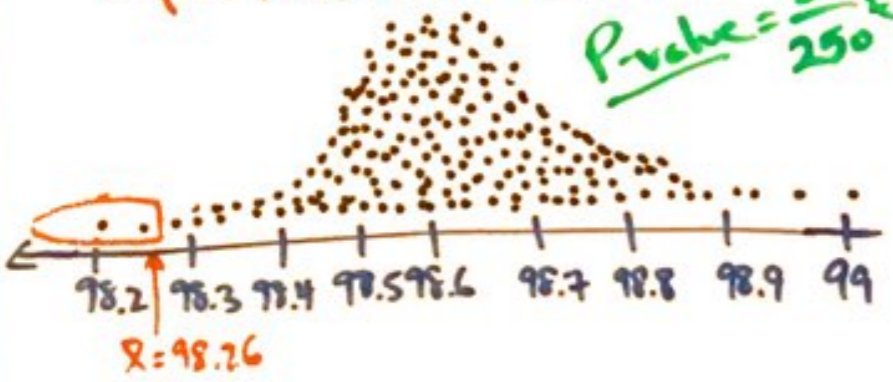


Randomized Simulation "Randomization"  
If  $H_0$  was true, what random samples (Statistics) could we get just by sampling variability.

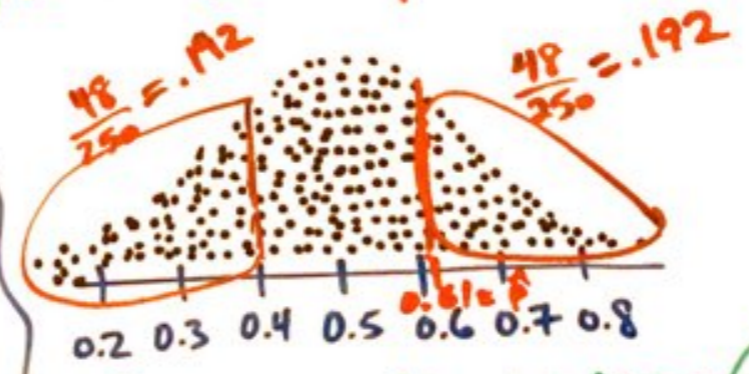


Test Statistics, Critical Values, P-values, Sig levels

Ex:  $H_0: \mu = 98.6^\circ F$   
Real  $H_a: \mu < 98.6^\circ F$  (Left-tailed test)  
Sample Data:  $\bar{X} = 98.26^\circ F$   
 $P\text{-value} = \frac{2}{250} = 0.008$



Ex:  $H_0: \pi = 0.5$   
 $H_a: \pi \neq 0.5$  (Two-tailed test)  
Real Sample Data  $\hat{p} = 0.61$



$P\text{-value} = 0.192 + 0.192 = 0.384$

