

Feb 23rd

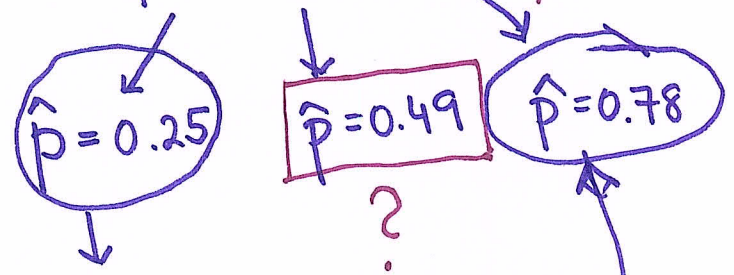
Hypothesis testing

Claim you want to substantiate: $p < \frac{1}{2}$ } H_a alternative hypothesis

Assume: $p = \frac{1}{2}$ } H_0 null hypothesis

collect data
statistical analysis
sample size 100
...

\hat{p} ... sample proportion of successes

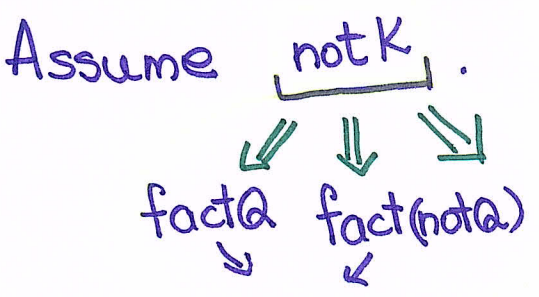


Not likely to come from the population dist'n w/ $p = \frac{1}{2}$

Proof by contradiction

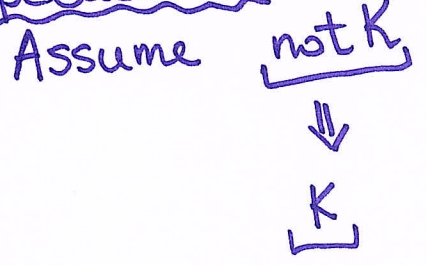
K... claim which I want to prove

What if K were not true?



Contradiction!

special case:



Population model:

Dist'n w/ an unknown mean μ ;
variance is given σ^2 .

Set our hypotheses:

null hypothesis: $H_0: \mu = \mu_0$

alternative hypothesis: $H_a: \mu \neq \mu_0$

a precise value/a number

Gather data:

n ... sample size

\bar{X}_n ... rnd variable

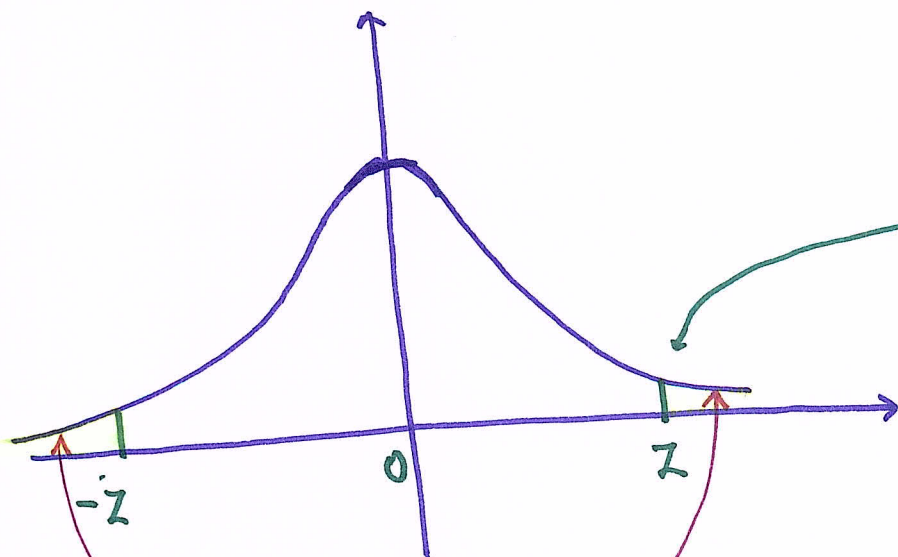
$\frac{\bar{X}_n - \mu_0}{\sigma/\sqrt{n}}$ " \sim " $N(0,1)$

Say, \bar{x}_n is the observed sample average

test statistic:

Z-score

$$z = \frac{\bar{x}_n - \mu_0}{\sigma/\sqrt{n}}$$



P-value