Stat 343, Mon 14-Sep-2020 -- Mon 14-Sep-2020
Probability and Statistics
Fall 2020

Monday, September 14th 2020

Topic:: Hypothesis testing intro
Read:: FASt 2.4

Negative binomial pmf?

Want $s = 3$

$\pi = 0.2$

$P(\text{takes } 13 \text{ tries or more?})$

Curious $P(\#\text{ of failures prior to 3 successes} \geq 10?)$

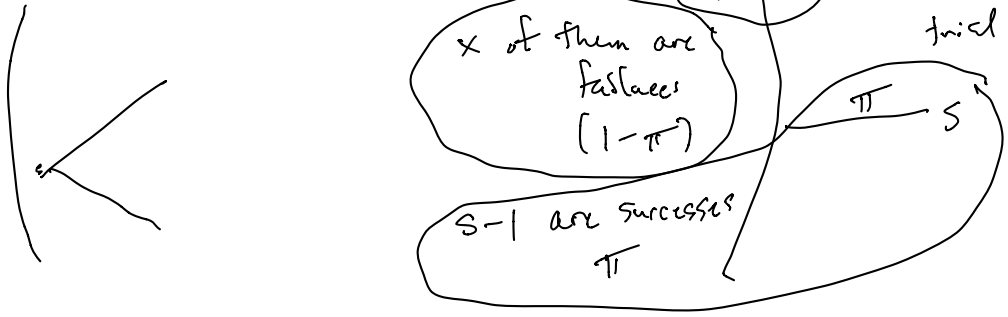
dnbinom
rnbinom
pnbinom
qnbinom

$= 1 - P(\#\text{ of failures is 9 or fewer})$

$= 1 - \text{pnbinom}(9, \text{size} = 3, p = 0.2)$

dnbinom gives $P(\#\text{ of failures prior to 5 successes is } x)$

$= \binom{5+x-1}{x} \pi^5 (1-\pi)^x$



Intro to R Markdown

How to

- start sections
- italicize, get bold text
- packages
- insert R code
  - code that isn't evaluated
  - results with hidden code(?)
  - make "random" results repeat

Hypothesis tests: first look

Do an analysis of soccer picks by Paul the Octopus:

- accurately picked 8 out of 8 matches in 2010 World Cup
  - method
  - 7 matches involved Germany, 8th was the final
- accurately picked 4 out of 6 German matches in UEFA Euro 2008

Other items:

- parameter vs. statistic
- null and alternative hypotheses, null distribution

→ $H_0: \pi = 0.5$ (i.e., Paul's chance of success is 0.5)

→ $H_a: \pi \neq 0.5$

- meaning of *P*-value = The chance of getting an observation at least as extreme as the one from our sample when the null hypothesis holds.
- conclusion
- relevant commands: `dbinom`, `binom.test`

- asymmetric distributions: Binom(20, 0.25), test stat is 9 "correct" answers

- Can we get close to the *P*-value using simulation?