Stat 381 Apr 29

Say we want to check if People in NYC are more inclined to get flu vaccine than Podunk, NY. Le p_1 = proportion for NYC
p_2 = prop. for Podunk

$H_0: p_1 = p_2 \Rightarrow p_1 - p_2 = 0$
$H_1: p_1 > p_2 \Rightarrow p_1 - p_2 > 0$

collect 2 samples

NY	Podunk
$n_1 = 105$	$n_2 = 62$
$\hat{p}_1 = .92$	$\hat{p}_2 = .87$

use Z-Test for this

$$Z = \frac{\hat{p}_1 - \hat{p}_2 - 0 \leftarrow (p_1 - p_2)_0}{se(\hat{p}_1 - \hat{p}_2)_0}$$

use pooled prop estimate for $\hat{p}_0 = \frac{n_1\hat{p}_1 + n_2\hat{p}_2}{n_1 + n_2}$

$$= \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\frac{\hat{p}_0\hat{q}_0}{n_1} + \frac{\hat{p}_0\hat{q}_0}{n_2}}} = \frac{\hat{p}_1 - \hat{p}_2}{\sqrt{\hat{p}_0\hat{q}_0\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

#3: $23C_3$

50 seats $50P_{37} = \frac{50!}{13!}$

first choose 37 seats $50C_{37} \rightarrow \frac{50!}{37!13!}$ ~~37!~~

Then 37!

You want to pack a suitcase with 4 pairs pants, 8 shirts and 2 jackets

You have 7 pairs pants, 15 shirts, 3 jackets.

In how many ways can you pack it?

~~$\binom{7}{4}\binom{15}{8}\binom{3}{2}$~~ $\binom{7}{4}\cdot\binom{15}{8}\binom{3}{2} =$

7 nCr 4 * 15 nCR 8 * 3 nCr 2

$\binom{n}{n-1} = \binom{n}{1} = n$

~~Yuck~~. What is the prob of drawing 5 cards consisting of 2♡s and 3◇s

13 each suit

52 cards

$$\frac{\#\text{ways } \heartsuit\heartsuit\diamondsuit\diamondsuit\diamondsuit}{\#\text{ways 5 cards}}$$

$$= \frac{13C_2 \cdot 13C_3}{52C_5}$$