mas170.04.21

Tuesday, April 21, 2020 9:35 AM

Agenda

leftovers: Ch 20 ✓, RevEx ✓✓✓✓

Ch 21 discussion

B3

A ✓,✓,✓

C3

Ch 20 C4 p370

0 1 fraction of 0's = ½ = fraction of 1's

$SD(\text{all 3 boxes}) = (1-0)\sqrt{(\tfrac{1}{2})(\tfrac{1}{2})}$ (shortcut ch17)

$= \frac{1}{2}$

$SE(\text{100 draws, any of these boxes}) = SD(\text{box})\sqrt{100}$

Rev 2,7,9 Ch 20

RevEx 2. p371 set up box!

1 ace, 5 (not aces) → 1000 rolls

ave(box) = 1/6

$SD(\text{box}) = (1-0)\sqrt{\frac{1}{6}\cdot\frac{5}{6}}$

$= \frac{\sqrt{5}}{6}$

expected percent (1's) = percent 1's in box = 1/6 ≈ 16.7%

$SE(\%\,1\text{'s}) = \frac{SD(\text{box})\sqrt{1000}}{1000}\cdot 100\%$

RevEx 7. p372

500 → (60,000) 10 (75%); (20,000) 11 (25%); 80000 tix total

over many many samples

T/F

T (a)

F (d)

expected (%1's in draws) = 25%

the percent 1's in draws will be exactly 25%

F (b)

T (c) ← check!

1 single sample

expected (%1's) is 25% ± ~~2%~~

%1's in draws will be about 25% ± 2%

$SD(\text{box}) = (1-0)\sqrt{(.25)(.75)} \approx .433$

$SE(\%\,1\text{'s}) = \frac{SD(\text{box})\sqrt{500}}{500}\cdot 100\% \approx 1.94\%$ (* Ch21)

SE(sum) vs SE(%1's)

↑ if question is about total sum of draws = total count of 1's drawn

127/500 = 25.4%

(e) T

(f) F

Ch 20 #9 p373

600 → 0 10 1

ave(box) = 1/3

$SD(\text{box}) = (1-0)\sqrt{\frac{1}{3}\cdot\frac{2}{3}}$

expected(sum) = 1/3 · 600 = 200

SE(sum) = SD(box)√600 ≈ 11.55

(Ch17 review)

Ch 21 A 4,7,8 p380

box → 400 → sample

sample without replacement

simple random sample

?? → has ≥100 emp: ? 1's ~ 2.75%; has <100 emp: 0's ~ 97.25%

? total ?? Unknown

sample

11 with ≥100 employees

389 with <100 employees

Sample (%1's) = 11/400 = 2.75%

Est. %1's in box ~ 2.75% ± 1.82%

↑ SE(%1's)

$SE(\%\,1\text{'s}) = \frac{SD(\text{box})\sqrt{400}}{400}\cdot 100\% = \sim 1.82\%$

$SD(\text{box}) = ? \approx (1-0)\sqrt{(.0275)(.9725)}$

≈ .164 ??

frac of 1's est; fraction of 0's

best estimate

what if $\sqrt{(.03)(.97)} \to .17$; $\sqrt{(.02)(.98)} \to .14$

p378 bootstrap method

A7 p380

20% 1; 80% 0 → 400

$SD(\text{box}) = (1-0)\sqrt{(.20)(.80)} = .4$

$SE(\%\,1\text{'s}) = \frac{SD(\text{box})\sqrt{400}}{400}\cdot 100\% = 2\%$

A8

?? ?? 1 0 → 400

3 different bootstraps estimates

est for %1's in box

Sample 1: 72 1's; 72/400 = 18%

Sample 2: 84 1's; = 21%

Sample 3: 48 1's; = 24.5%

(a) $18\% \pm \frac{\sqrt{(.18)(.82)}\sqrt{400}}{400}\cdot 100\% = 1.92\%$

(b) $21\% \pm \frac{\sqrt{(.21)(.79)}\sqrt{400}}{400}\cdot 100\% = 2.03\%$

(c) $24.5\% \pm \frac{\sqrt{(.245)(.755)}\sqrt{400}}{400}\cdot 100\% = 2.15\%$

next time: B3 p383; C3

cont'd next time: cont'd