Stat 7 class 22 10-31-19

R-52 $\frac{1000}{60} \doteq$ 16 hours

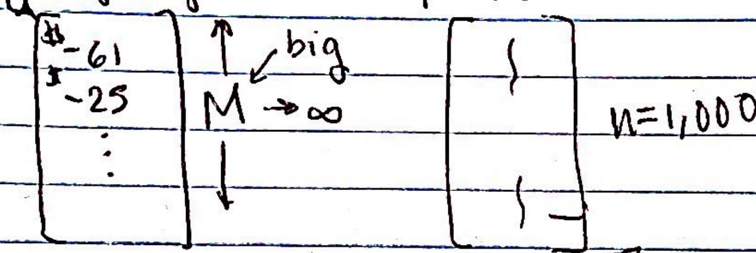
P_F(coming out ahead after 1000 \$1 bets on a single #) =
F = frequentist
$= P_F(S > \$0)$

2 ways: 1) math
2) computer simulation

L-22

ex \$-61

imaginary data set all possible

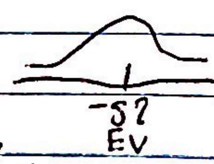


ex \$-25

long run mean: expected value of S = EV of S = $E_{IID}(S)$ = ?
= \$-52

long run SD: standard error of S = \$182

long run hist.

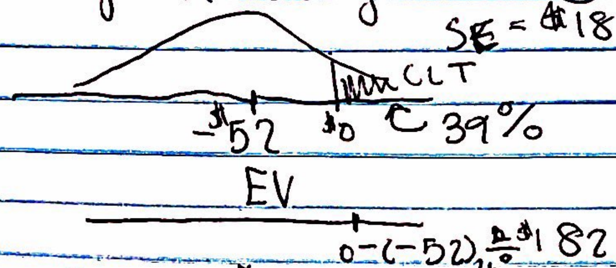


$E_{IID}(S) = (\text{\# of draws})(\text{pop mean}) = n\mu$
→ 1,000 (\$-.05)

R-22 Formula 2
$E_{IID}(S) \doteq -\$52$

L-124

long run histogram of S



After $n=1000$ \$1 bets on single #, you expect to have won

EV of $S = n\mu = \$-52$, give or take

(Standard error of S) = \$182

$= (\text{SE of } S) = SE_{IID}(S) = ?$

$SE_{IID}(S) =$

S is uncertain; $SE_{IID}(S)$ represents how much uncertainty we have about S

information ↑ ➡ uncertainty ↓ and vice versa

S is uncertain because

$S = (y_1 + \cdots + y_n)$ and each of the y_i is uncertain

The pop SD σ represents how much uncertainty we have about each of the y_i

As $\sigma \uparrow$ $SE_{IID}(S) \uparrow$

Scanned with CamScanner

N $\times$

μ $\times$

σ $\uparrow$ $\quad SE_{IID}(S)$ $\uparrow$

n $\uparrow$ $\quad\uparrow$

M $\times$

(R-22)

$$SE_{IID}(S) = \sigma\sqrt{n}$$

$$= (5.76)(\sqrt{1000})$$

$$= 182$$

R-53
R-54

$$\bar{y} = \frac{1}{n}\sum_{i=1}^{n} y_i = \frac{S}{n}$$