this probability time: models

next time: for sums and means

read: DD(A) ch. 1-3, (B) 1-10

STAT 7 31 oct 19

LN pp. 1 → 136 ①

homework 2 due tonight

take-home midterm due Sun night 10 Nov 19; suggest work on it a bit every day

DD extra office hours for midterm daily starting Mon

$\frac{100 x}{6 x} \doteq 16$ hours

$= P_F(S > \$0)$

P(coming out ahead after 1000 \$1 bets on single #) = ?

frequentist

2 ways

① math ② computer simulation

(1710) (since $\doteq$ 1950)

L-122

R-22 formula (2)

expected value of \$ = EV of \$ = $E_{IID}(S) = ?$

math fact

$E_{IID}(S) = \begin{pmatrix} \# \text{ of} \\ \text{draws} \end{pmatrix} \begin{pmatrix} \text{pop} \\ \text{mean} \end{pmatrix} = n\mu$

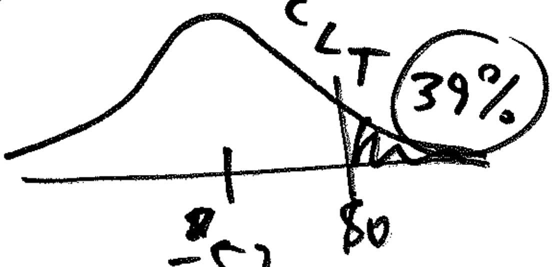
$(1000)(-\$0.05)$

$E_{IID}(\$) \doteq -\$52$

utility (1730)

SE \$182 L-124 → CLT

long-run hist of \$



deMoivre (1710)

$+0.29 = \dfrac{(\$0) - (-\$52)}{\$182}$

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

(EV of sum) $= n\mu = -\$52$, give or take about

$SE(\$) \doteq \$182$ (standard error of \$)

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

math fact: $SE_{IID}(\$) =$

(noisy)
S is uncertain ; $SE_{IID}(S)$

(noise)
represents how much uncertainty

we have about S

signal
information ↑

uncertainty ↓
noise

S is uncertain because

$S = (Y_1 + \dots + Y_n)$ 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 σ ↑ $SE_{IID}(S)$ ↑

N ✗

μ ✗

σ ↑ $SE_{IID}(S')$ ↑

n ↑ ↑

M ✗

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

R-22 ~~(2)~~

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

$$\doteq \$182$$