AMS 7
8 May 17
①

this time: prob. models for means

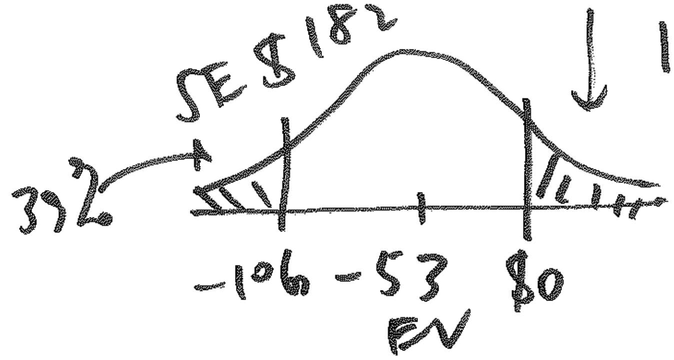
next time: statistical inference

extra office hr
Wed 1:45 – 2:15 pm
~~(Jack's Lounge)~~

P(coming out ahead) = P(S > \$0)

$SE(S) \underset{IID}{=} \sigma\sqrt{n} = \$4.02\sqrt{1000} \doteq \$127$

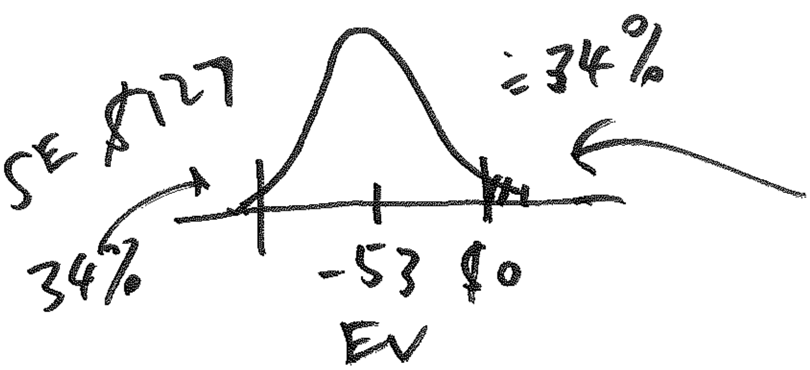
≐ 39%




long run hist of S
n = 1000

(A) single #

≐ 34%




ditto

(B) split

$\boxed{q:}$ which strategy is better?

$\boxed{A:}$ depends on your degree of risk aversion (B) or risk seeking (A)

②

sample

$$\begin{pmatrix} y \\ \\ \\ \end{pmatrix} \begin{matrix} \uparrow \\ n \\ \downarrow \end{matrix}$$

IID

sum $S = n\bar{y}$

mean $\bar{y} = \frac{S}{n}$

p. R-52

CLT

examples

R-55

Hypokalemia case study

L-127

(prob. model for mean) + (measurement error)

2 sig figs

$$\begin{bmatrix} 16 \\ 16 \\ \vdots \\ \vdots \end{bmatrix}$$

3 sig figs

$$\begin{bmatrix} 16.0 \\ 16.0 \\ \vdots \\ \vdots \end{bmatrix}$$

4 sig figs

$Y_1$ obs. 1

$$\begin{bmatrix} 15.97 \\ 16.01 \\ \vdots \\ \vdots \end{bmatrix}$$

stochastic

deterministic: no measurement error
you always get the same answer

probabilistic: meas. error

basic measurement error model:

$$\underbrace{\begin{pmatrix}\text{observation}\\ \underline{1}\end{pmatrix}}_{y_1} = \begin{pmatrix}\text{true}\\ \text{value}\end{pmatrix} + \begin{pmatrix}\text{bias}\end{pmatrix} + \underbrace{\begin{pmatrix}\text{"random"}\\ \text{error}\\ 1\end{pmatrix}}_{e_1}$$

$$\underbrace{\begin{pmatrix}\text{obs. } 2\end{pmatrix}}_{y_2} = \begin{pmatrix}\text{true}\\ \text{value}\end{pmatrix} + \begin{pmatrix}\text{bias}\end{pmatrix} + \underbrace{\begin{pmatrix}\text{random}\\ \text{error}\\ 2\end{pmatrix}}_{e_2}$$

$$\vdots \qquad\qquad \vdots \qquad\qquad \vdots \qquad\qquad \vdots$$

$$\underbrace{\begin{pmatrix}\text{obs. } n\end{pmatrix}}_{y_n} = \begin{pmatrix}\text{true}\\ \text{value}\end{pmatrix} + \begin{pmatrix}\text{bias}\end{pmatrix} + \underbrace{\begin{pmatrix}\text{random}\\ \text{error}\\ n\end{pmatrix}}_{e_n}$$

theta

$$\begin{pmatrix} y_1 \\ \vdots \\ y_n \end{pmatrix} = \begin{bmatrix} \theta \\ \vdots \\ \theta \end{bmatrix} + \begin{bmatrix} b \\ \vdots \\ b \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ \vdots \\ e_n \end{bmatrix}$$