Discussion section (week 2)

AMS 131
10 April

$P($ coming out a head, $n = 1000$ single # bets $) = ?$ ①

$P(S' > 0)$

your net gain after 1000 $1 bets on a single # | real-world | is like | the sum S' of $n = 100$ IID draws from pop'n data set | mathworld

$P($ coming out a head, $n = 1$, single # $) = \frac{1}{38}$

$\approx 2.6\%$

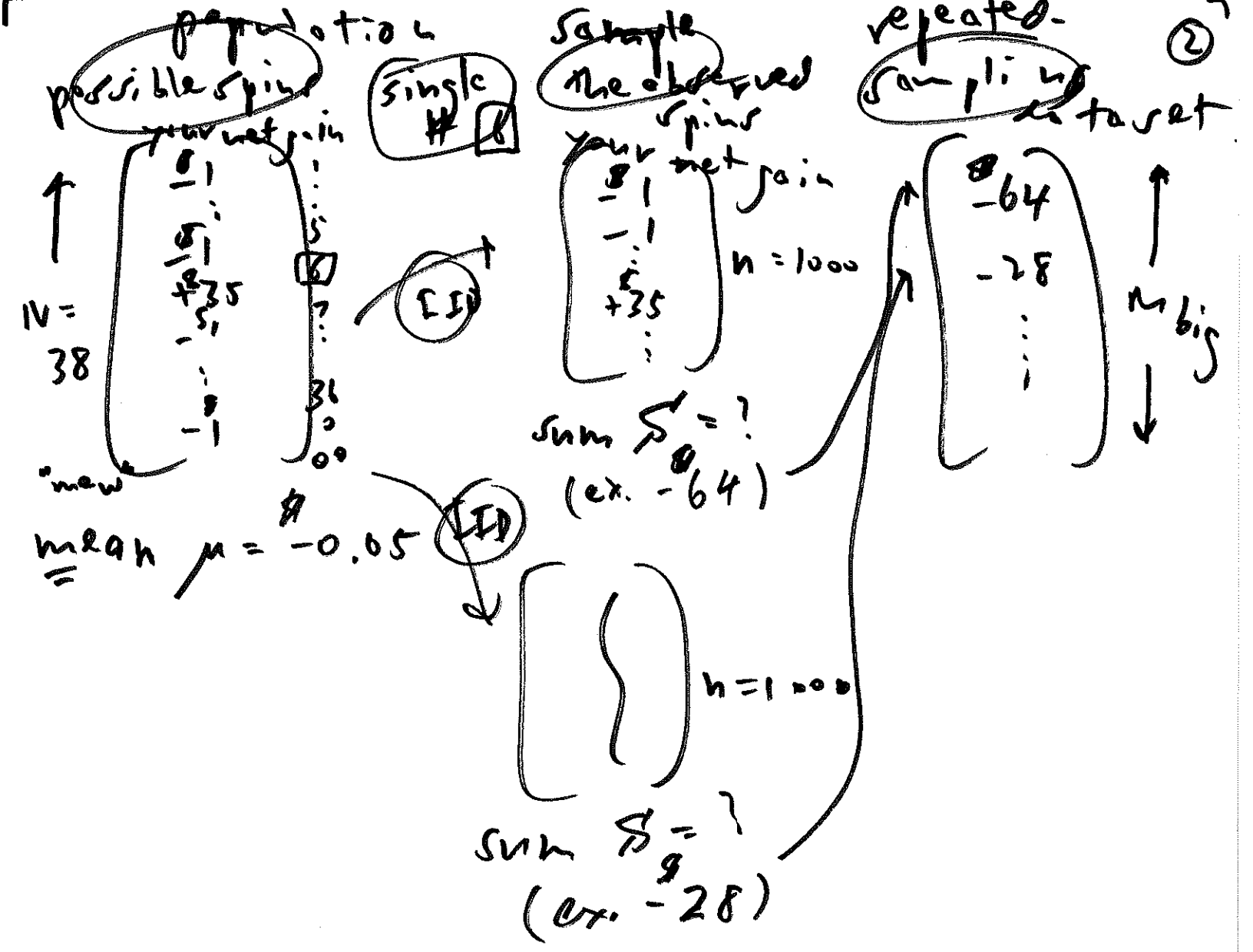
Film ✓

$P($ ——— ——— single # $) = \frac{2}{38}$

$\approx 5.2\%$

$\mu = \frac{37(-1) + 1(+35)}{38} = \frac{-2}{38} = -\$0.05$

.052


population
possible spins
your net spin
single #
sample
the observed spins
your net spin
repeated-sampling
dataset
IV = 38
"new" mean μ = −0.05
I
II
III
n = 1000
sum S = ?
(ex. −64)
sum S = ?
(ex. −28)
n bigger
②

on each $1 bet (single #) we expect to lose $0.05,

27 (+35) 973 -28

$\frac{100}{38} = 26$

$(26)(+35) + (974)(-11)$

-64

$P_F(S > 0) \doteq$ $\frac{\#\text{ of times } S>0}{\#\text{ of repetitions of simulating } S}$

Monte-Carlo estimate

{ Metropolis Ulam {