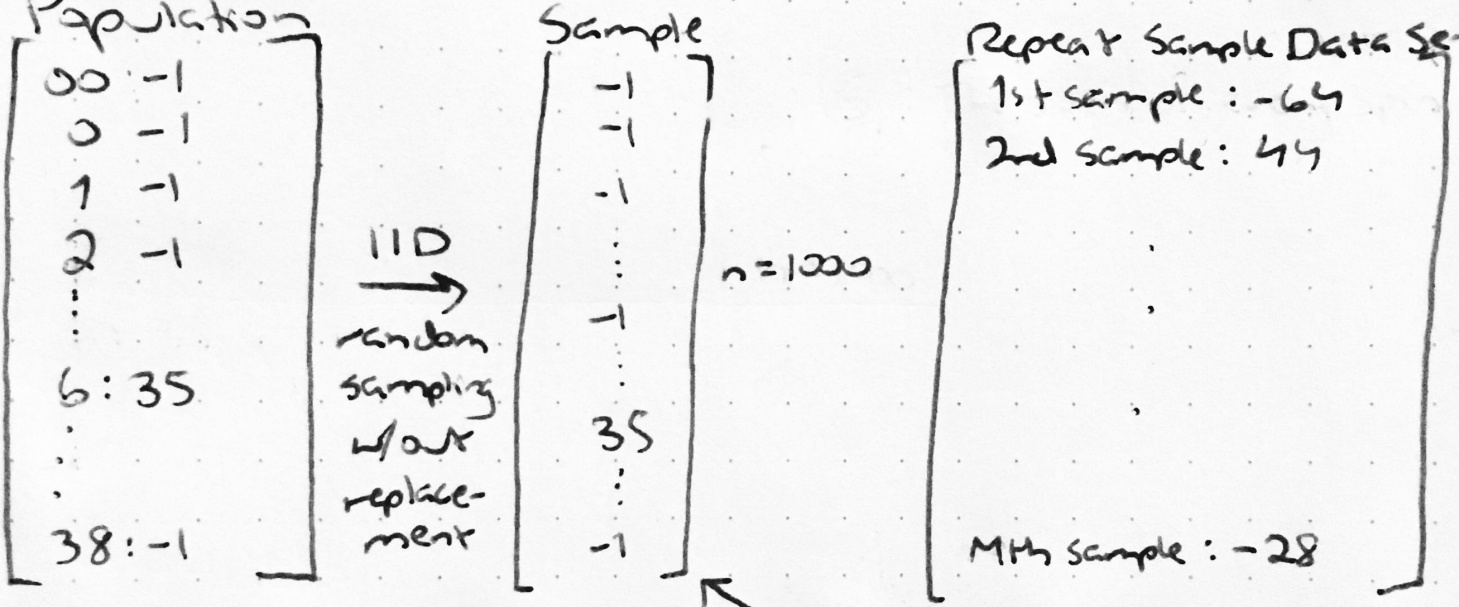
4/10/19 Section 2 Rene Gutierrez

How do you compute probabilities?
- Math formulas
- Simulation

Roulette Case Study
Strategy 1: You play 1000 times and bet $1 on 6

Strategy 2: You play 1 time and bet $1000 on 6



S_1 = The sum of every spin — your net gain from observed spins

$S_1 = (26)(35) + (974)(-1) = -64$
$S_2 = (29)(35) + (971)(-1) = 44$
$\vdots$
$S_M = (27)(35) + (973)(-1) = -28$

Expected Loss: $0.05

$\mu = (-1)\left(\frac{37}{38}\right) + (35)\left(\frac{1}{38}\right) = -\left(\frac{2}{38}\right) = \frac{-1}{19} \approx -0.05$

μ mean

$\left(\frac{1}{38}\right)$ ↑ P(win when betting on a single #)

$\left(\frac{2}{38}\right)$ ↑ P(win when betting on a split)

$\frac{-2}{38} \cdot 1000 = \$-52.63$ If you play a 1,000 times this is your expected loss.