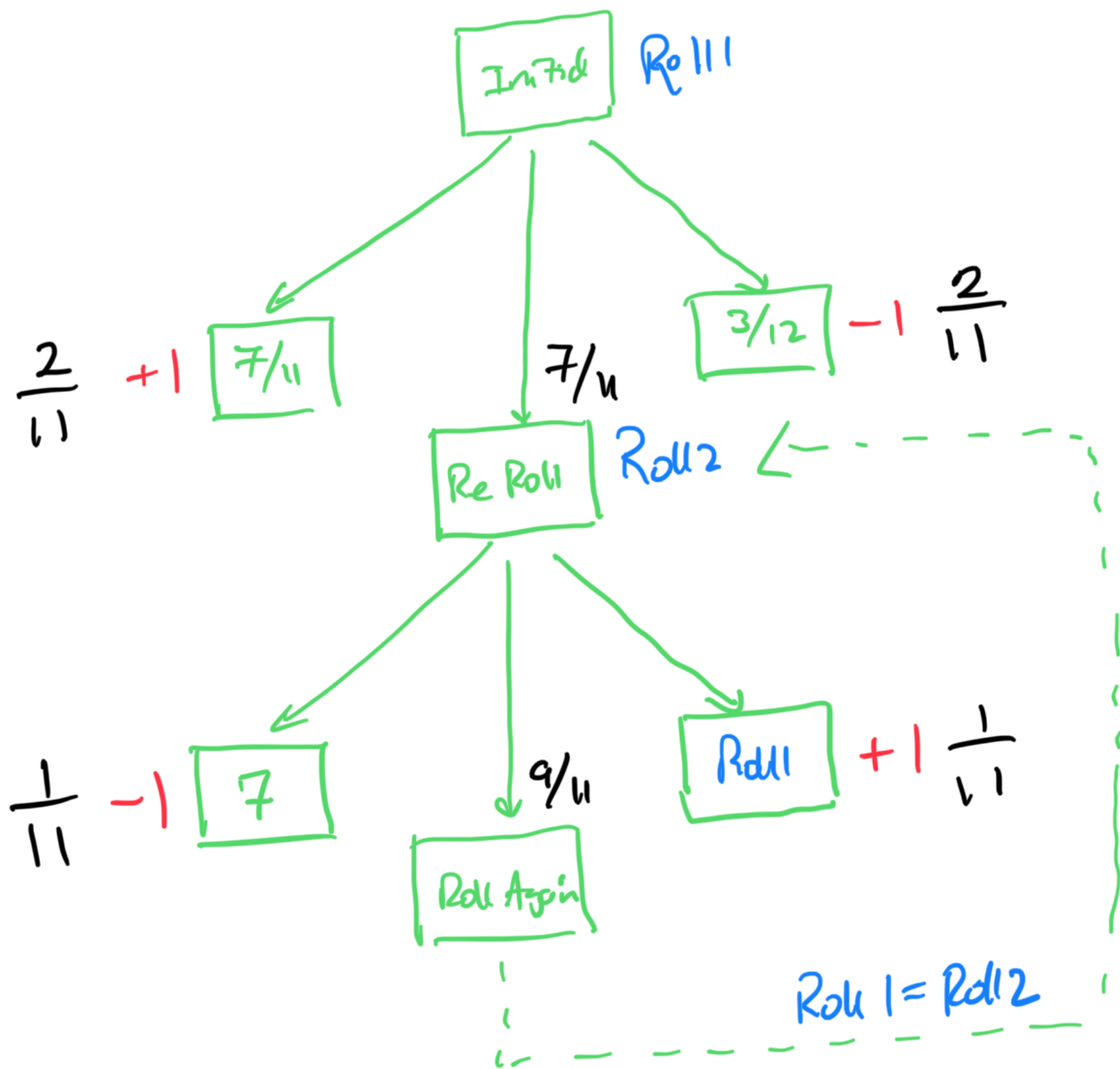


Craps Game Odds



$$P(+1) = \frac{2}{11} + \frac{7}{11} \left(\frac{1}{11} + \frac{9}{11} \left(\frac{1}{11} + \frac{9}{11} \left(\frac{1}{11} + \dots \right) \right) \right)$$

P_0

$$\text{Let } P_0 = \frac{1}{11} + \frac{9}{11} \left(\frac{1}{11} + \frac{9}{11} \left(\frac{1}{11} + \dots \right) \right) = P_0!$$

$$\therefore P_0 = \frac{1}{11} + \frac{9}{11} P_0$$

$$P_0 \left(1 - \frac{9}{11} \right) = \frac{1}{11}$$

$$P_0 \left(\frac{2}{11} \right) = \frac{1}{11}$$

$$\boxed{P_0 = \frac{1}{2}}$$

$$P(+1) = \frac{2}{11} + \frac{7}{11} P_0$$

$$= \frac{2}{11} + \frac{7}{11} \left(\frac{1}{2} \right)$$

$$= \frac{2}{11} + \frac{7}{22} = \frac{4}{22} + \frac{7}{22}$$

$$= \frac{11}{22} = \frac{1}{2} \quad !$$

$$\boxed{P(+1) = \frac{1}{2}}$$

Similarly, $P(-1) = \frac{1}{2}$,

Since $P(-1) = 1 - P(+1)$.

Zylob - large - simulation . py .

Philosophy :

① Run the game, to completion,
num_sims 1000 times. \uparrow credits = \emptyset
= 1000

② For each full Game, record:
credit_result [] credits as a function of round #
credit_round [.....]

list of lists!!!! \nearrow round_result [] \rightarrow # of rounds.

③ We also want a list to record the round number sequence for each game.

\searrow result_number [] \rightarrow [1, 2, 3, ..., rounds]

for plotting purposes.

credit_result = []

round_result = []

result_number = []

for i in range(num_sims):

credit_round = []

result_round = []

round-result.append [rands]
credit-result.append [credit-rand]
result-number.append [result-rand]
