Carolina Poker Club: Problem Set 2

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1 Combinatorics & Probability

1. Estimate the fraction $\frac{\binom{14}{2}}{\binom{18}{2}}$ mentally

2. Estimate the number 50! to the nearest power of 10

3. You have 18 chips of equal weight. You have 1 heavier chip. They are identical in appearance and feel. You do, however, have a lever scale. What is the minimum number of times you need to use the scale to *guarantee* you can find the heavier chip?

4. BONUS: Suppose you have $100 and you are placing bets against an infinite house (that is, the house will *never* run out of money). Each bet, you have a 51% chance of doubling your bet, and a 49% chance of losing your bet. You place $1 bets infinitely or until you run out of money. What is your probability of going broke?

2 Poker Theory

1. You are BTN. Action folds to you. You raise to 3bb (pot becomes 4.5bb). SB folds. BB four-bet to 6bb. The BB is a regular, so you know he will fold to a 15bb five-bet half of the time. Ignoring post-flop equity, is it profitable to five-bet?

2. You have JThh and the flop comes Ah 3d 4c, how often do you make one of your backdoor draws through the river?

3. You have KsJd and the board is Jh 3d 3c 5s 2s. How many possible combinations of full houses could your opponent hold?

4. Describe the 4 main poker player archetypes and formulate how to play against them:

   - Tight Passive (NIT)
   - Loose Passive (Calling Machine) (Fish)
   - Tight Aggressive (TAG)
   - Loose Aggressive (LAG)

3 Solutions

3.1 Combinatorics & Probability

1. 0.5947

2. 10^{64}

3. 3

4. $(\frac{0.49}{0.51})^{100} \approx 1.83\%$

3.2 Poker Theory

1. No (55.8% > 50%)

2. 5.55% (flush draw + straight draw - royal flush draw)

3. 23

4.
   - Tight Passive (NIT): Tight, selective opening range. Tight, fold-heavy post-flop play. Counter by applying aggressive pre-flop pressure. Often continue pressure on flop. Fold more frequently when facing aggression.

   - Loose Passive (Calling Machine) (Fish): This player will often call too frequently, and open too loosely. Counter by betting more with strong hands and play passively with weaker.

   - Tight Aggressive (TAG): Tight, selective opening range that differs based on position. Aggressive play after entering pot. Counter by increasing pre- and post-flop pressure and respecting their range based on their position.

   - Loose Aggressive (LAG): This player will open too loosely and play aggressively post-flop. Counter by bluff catching more frequently.