

Homework 2, Stat 100a, due Mon Feb14, 2pm. Submit as a pdf by email to
STAT100AW22@stat.ucla.edu.

The assignment is problems 4.9, 4.18, 4.21, and 5.2.

4.9 In a hand of the 2005 \$1 million Bay 101 Shooting Star World Poker Tour event with three players left and blinds of \$20,000 and \$40,000 plus \$5000 antes, the average chip stack was \$1.4 million. The first player to act was Gus Hansen, who raised to \$110,000 with $K\heartsuit 9\clubsuit$. The small blind was Jay Martens, who reraised to \$310,000 with $A\clubsuit Q\heartsuit$.

The big blind folded and Hansen called. The flop was $4\heartsuit 9\heartsuit 6\clubsuit$; Martens checked; Hansen went all-in for \$800,000; and now Martens had a tough decision. He decided to call, at which point one of the announcers, Vince van Patten, said, "The doctor making the wrong move at this point. He still can get lucky of course." Was it the wrong move? Comment.

4.18 Suppose you are heads up on the river, your opponent bets the size of the pot, and you are considering calling or folding. With at least what probability does calling have to be correct in order for calling to be more profitable in the long term?

4.21 On day 5 of the WSOP Main Event in 2015, Chad Power raised to 50,000 in early position with $J\heartsuit$

$10\spadesuit$, and the big blind, Sal DiCarlo, called with $A\clubsuit 8\clubsuit$. Because of blinds and antes, the pot was now 148,000. The flop was $9\clubsuit K\clubsuit 4\spadesuit$. DiCarlo checked, Power bet 40,000, and DiCarlo called. After the $Q\heartsuit$ was dealt on the turn, DiCarlo checked, Power bet 115,000, and DiCarlo called, making the pot 458,000. The river was $6\heartsuit$, DiCarlo checked, Power bet 500,000, and DiCarlo folded. ESPN announcer Lon McEachern said "Chad Power will take that pot. Very nicely played by the poker teacher." However, did he win more by luck or skill? Using a poker odds calculator such as the one at cardplayer.com to obtain the relevant probabilities, calculate how much expected profit Power won (a) due to luck on the flop, (b) due to skill on the flop, (c) due to luck on the turn, (d) due to skill on the turn, (e) due to luck on the river, and (f) due to skill on the river. (g) Summing up your answers, how much in total expected profit did Power win on the flop, turn, and river due to luck and how much due to skill?

- 5.2 Suppose you repeatedly play hands of Texas Hold'em, and let X_1 = the number of hands you are dealt until you get a pocket pair, and X_2 = the number of hands until you are dealt two black cards. Let $Y = \min\{X_1, X_2\}$ and $Z = \max\{X_1, X_2\}$. Find general expressions for the pmf of Y and the pmf of Z .