Statistics 100a Exam

Rick Paik Schoenberg, Mar 3, 2015, 11am - 12:15pm.

PRINT YOUR NAME:

Victor Lai

SIGN YOUR NAME:

Victor Lai

Do not turn the page and start the exam until you are told to do so.

You may use a dark pen or dark pencil, calculator, the textbook, and any notes.

There are 14 multiple choice questions worth 7 points each.

For each question, mark one answer only. No need to show work on these, and no partial credit will be given.

Final answers are rounded to 3 significant digits.

7s means the seven of spades. Qh means the queen of hearts, etc.

Heads up means one against one.

$e \approx 2.718$.

1. A face card is a J, Q, or K. What is P(you are dealt 2 face cards but not a pocket pair)?
a) 3.04%. b) 3.62%.
c) 4.12%. d) 4.57%. e) None of the above.

2. Out of 10 players in a given hand, what is the expected number of players who are dealt at least one spade?
a) 4.41. b) 4.65.
c) 6.13. d) 6.57. e) None of the above.

3. Suppose X_1 and X_2 are independent uniform random variables on $(0, 1)$, and let $Y = max\{X_1, X_2\}$. Let $f(c)$ denote the pdf of Y. What is $f(c)$, for c between 0 and 1? *Hint: First find the cdf of Y.*
a) 1. b) $c^3 + 2c^2 - \log(c)$.
c) $c^3 - 1$. d) $2c$. e) None of the above.

4. Suppose over 144 days, your average daily profit is \$10, with a SD of \$100. Assume each day's results are iid. Find a 95% confidence interval for your expected daily profit.
a) \$10 ± \$14.3. b) \$10 ± \$15.5.
c) \$10 ± \$16.3. d) \$10 ± \$18.8. e) None of the above.

5. Continuing from the previous problem, assuming your daily profits continue to have an average of \$10 and an SD of \$100, how many **more** days would you have to observe before you could conclude that the 95% confidence interval for your expected daily profit does not contain zero?
a) about 240 more. b) about 280 more.
c) about 320 more. d) about 360 more. e) None of the above.

6. Suppose you raise with Ac Qc, and your opponent re-raises all in. Suppose you know that your opponent would always make this re-raise if she had AA, KK, QQ, or AK, but would not make this re-raise with any other hole cards. Given this information, and given your two cards, what is the probability that your opponent has AA?
a) 8.24%. b) 12.5%.
c) 18.4%. d) 19.5%. e) None of the above.

7. In a hand between Martens and Hansen, there were 675,000 chips in the pot when the flop of 4d 9h 6c was revealed. Martens checked with Ac Qh, and Hansen went all in for 800,000 chips with Kd 9c. Martens had more than 800,000 chips left, and after thinking about it a while, he decided to call. At this point, given their cards, what is the probability that Martens will win the hand?

a) 18.2%. b) 19.5%.
c) 21.3%. d) 22.1%. e) None of the above.

8. Continuing with the previous problem, one of the announcers said Martens was "making the wrong move at this point. He still can get lucky of course." Was it the wrong move? Assume Martens knew his opponent's cards and suppose this was a winner take all tournament. Was Martens wrong to call?

a) No, because his probability of winning is greater than the necessary 15.2% for a call to be correct.
b) No, because his probability of winning is greater than the necessary 17.4% for a call to be correct.
c) Yes, because his probability of winning is less than the necessary 35.2% for a call to be correct.
d) Yes, because his probability of winning is less than the necessary 44.7% for a call to be correct.
e) None of the above.

9. Suppose X is the time in minutes until your opponent makes a huge bluff, and suppose the expected value of X is 15. What does the Markov inequality imply about $P(X \geq 50)$?

a) $P(X \geq 50) \leq 3.52\%$. b) $P(X \geq 50) \geq 15.0\%$. c) $P(X \geq 50) \leq 15.0\%$.
d) $P(X \geq 50) \leq 30.0\%$. e) None of the above.

10. Suppose player A and player B are heads up. Player A has Jh Jd and player B has As Ks. Before the river, the board is Js 10s 4h 3c and the pot contains \$200. The river is the Qc, player B bets another \$100 and player A calls. According to how luck and skill are defined in the book, which of the following is true of how much player B gained due to luck and skill on the river?

a) On the river, B gained \$155 due to luck and \$100 due to skill.
b) On the river, B gained \$55 due to luck and \$100 due to skill.
c) On the river, B gained \$55 due to luck and \$200 due to skill.
d) On the river, B gained \$100 due to luck and \$100 due to skill.
e) None of the above.

11. What is P(you are dealt AK suited or AQ suited)? [Suited means your two cards are of the same suit.]

a) 0.219%.
b) 0.603%.
c) 0.714%.
d) 0.882%.
e) None of the above.

12. What is the probability that both of your hole cards will be 10 or higher (10, J, Q, K, or ace)?

a) 14.3%.
b) 17.4%.
c) 26.2%.
d) 28.5%.
e) None of the above.

A suited ace means an ace with another card of the same suit. For the following 2 questions, suppose you will play Texas Holdem until you are dealt any suited ace, and let X = the number of hands you play. (So, for instance, if on the first hand you are dealt 8c 3d, and on the second hand you are dealt As 3s, then $X = 2$.)

13. What is the expected value of X?

a) 15.0.
b) 27.6.
c) 44.4.
d) 57.2.
e) None of the above.

14. What is the standard deviation of X?

a) 11.2.
b) 14.2.
c) 20.3.
d) 27.1.
e) None of the above.