Quiz 1

Instructions: Complete the quiz by selecting the correct answers (for multiple choice) and showing the work needed to arrive at the answers. You may use the attached sheet to help you. Suppose the games are traditional American casino games (craps, 0-00 roulette, blackjack). Note: If I ask for how much you win, you should not include the original amount bet in the "winnings" calculation.

If, after looking at or taking the quiz, you would prefer not to count this quiz toward your grade, and instead have the final exam carry the weight of this exam, simply put a large slash across the front page, and I won't grade your quiz.

Craps

1. Consider a place bet on the number 9. Rolling 9 wins the bet, rolling 7 loses the bet, and other rolls are irrelevant to this bet.

What is the probability of winning this bet?

a. 6/36
b. 4/10
O c. 4/36
d. 6 to 36
c. [none of the above]

What are the true odds against winning this bet?

a. 7 to 5
b. 36 to 6
O c. 6 to 4
d. 6 to 3
c. [none of the above]

If the casino paid you the true odds on this bet, how much would it give you for your $5 winning bet on the 10?

a. $56
b. $6.50
O c. $7
d. $7.50
c. $10

What is the house advantage (HA) for this bet? Recall that the casino payoff is $7 on a winning $5 place bet on the number 10. You must at least set-up the formula, and simplify. You don't have to solve it entirely.

From the formula sheet, payoff \( x = \frac{1}{2} \) to \( y \) to \( w \) for true odds \( y : w \) to \( x \) is:

\[
\frac{y \alpha - x w}{2(y + w)}
\]

\[
x = 7
\]
\[
y = 3
\]
\[
w = 2
\]

So... 

\[
\frac{3(5) - 7(2)}{5(3 + 2)} = \frac{1}{25}, \text{ or } 4\%
\]
2. What is the expected value (EV) for a $5 place bet on the point number 4? Rolling 4 wins the bet, rolling 7 loses the bet, and other rolls are irrelevant to this bet.
   a. $9
   b. -$5
   c. $0.33
   d. -$4
   e. [none of the above]

\[
EV(\text{bet}) = (\frac{3}{9})(\frac{3}{9}) + (-\frac{1}{9})(\frac{6}{9})
= 3 - 3.33 = -0.33
\]

3. Suppose you make a $20 pass line bet. What happens if on the come-out roll, you get...
   a. 11 — win $20
   b. 12 — lose the bet
   c. 2 — lose the bet
   d. What is rolling a 2, 3, or 12 called? craps!

4. Suppose the current point is 4. You have a $10 pass line bet, plus an odds bet (behind the pass line) of $20. What is the total amount you win on these two bets if you roll a 4 before a 7? (Do not include the amount you bet in calculating your “win”.)
   a. $10
   b. $20
   c. $30
   d. $40
   e. $50

5. What is the probability of rolling a 7 on the next roll of the dice? 1/6 or 16.67%.

6. Is the probability of rolling 7 on the next roll affected by what the last roll was? Explain.
   No. Independent events.

7. What is handle? Why is it easy to track for slot machines, but not for craps?
   Amount of money bet. The machine easily tracks $ put into it. But there's no mechanism to track total bets on a table game with chips.

\textbf{Roulette}

8. Consider a $5 bet you have placed on the number 16.
   a. How much do you lose if the number 24 hits? $5
   b. How much do you win if the number 16 hits? pays $35:1, so $35.5, or $175
c. What is the probability of hitting the number 16 in roulette?

\[
\frac{1}{38}
\]

d. What are the odds against hitting the number 16 in roulette?

\[
37 \text{ to } 1
\]

e. What is the house advantage (HA) for this bet in roulette?

From formula sheet:

\[
\frac{37-35}{37+1} = \frac{2}{38} = \frac{5.26 \%}{y+1}
\]

f. Suppose you bet $100 on "Red". How much does the casino pay you if the next roll is 21 Red?

$100 (plus you get your $100 Back)

Other questions

10. Given that you wish to gamble for money, which of the following has the worst expected value (EV) for any particular $100 bet?
   a. craps
   b. roulette
   c. slot machines
   d. State lottery

11. How would gross gaming revenue (GGR) from a slot machine be calculated?

\[
\text{Handle} - \text{players' winnings} = \text{total amount bet} - \text{prizes paid}
\]

12. What is an "independent event" with respect to gambling and casino games?

Two events (e.g., rolls of dice) that do not depend on each other.

13. Critics of the lottery argue that it is a very regressive "tax." Explain what this means and why this is typically the strongest argument against lotteries.

It means people with lower incomes pay a higher percentage of their incomes on the "lottery tax," relative to higher income people.

14. Briefly explain why casinos began spreading outside of Nevada and Atlantic City beginning in about 1990. Specifically, what were 1987 and 1988 legal "events" that led to where we are now?

In 1987, a "New York" case in CA Supreme Court (U.S.) ruled that states don't have jurisdiction over tribal gambling.

In 1988, Congress passed the Indian Gaming Regulatory Act, which said that states and tribes must enter compacts for tribal casinos. And tribes can offer games as long as they're not banned in the state.