Lesson 1

Back to Week 1

8/8 points earned (100%)

Quiz passed!

1 / 1 points

1.
If you randomly guess on this question, you have a .25 probability of being correct. Which probabilistic paradigm from Lesson 1 does this argument best demonstrate?

- Classical

Correct Response

- Frequentist
- Bayesian
- None of the above

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1 / 1 points

2.

On a multiple choice test, you do not know the answer to a question with three alternatives. One of the options, however, contains a keyword which the professor used disproportionately often during lecture. Rather than randomly guessing, you select the option containing the keyword, supposing you have a better than 1/3 chance of being correct.

Which probabilistic paradigm from Lesson 1 does this argument best demonstrate?

- Classical
- Frequentist
- Bayesian

Correct Response

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1 / 1 points

3.

On average, one in three students at your school participates in extracurricular activities. You conclude that the probability that a randomly selected student from your school participates is 1/3.

Which probabilistic paradigm from Lesson 1 does this argument best demonstrate?

- Classical
- Frequentist

Correct Response

- Bayesian

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1 / 1 points

4.

For Questions 4-6, consider the following scenario:

Your friend offers a bet that she can beat you in a game of chess. If you win, she owes you $5, but if she wins, you owe her $3.

- Suppose she is 100% confident that she will beat you. What is her expected return for this game? (Report your answer without the $ symbol.)

3

Correct Response

This is $3 \cdot (1) - 5 \cdot (0)$. If she is certain she will win, then she expects to receive the $3.

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1 / 1 points

5.
Chess:

- Suppose she is only 50% confident that she will beat you (her personal probability of winning is $p = 0.5$). What is her expected return now? (Report your answer without the $ symbol.)

-1

Correct Response
This is $3 \cdot (0.5) - 5 \cdot (0.5)$. Clearly, she wouldn't have offered this bet if she was only 50% confident that she would win.

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1 / 1 points

6.
Chess:

- Now assuming your friend will only agree to fair bets (expected return of $0), find her personal probability that she will win. Report your answer as a simplified fraction.

Hint: Use the expected return of her proposed bet.

Preview

$$0.625$$

0.625

Correct Response

Any value of p (the probability of her winning) lower than 5/8 would result in a negative expected return for your friend.
She would not have offered these odds for such a p.
Your answer, 0.625, is equivalent to the instructor's answer 5/8.

1 / 1
points

7.

For Questions 7-8, consider the following "Dutch book" scenario:

Suppose your friend offers a pair of bets:

(i) if it rains or is overcast tomorrow, you pay him $4, otherwise he pays you $6;

(ii) if it is sunny you pay him $5, otherwise he pays you $5.

- Suppose rain, overcast, and sunny are the only events in consideration. If you make both bets simultaneously, this is called a "Dutch book," as you are guaranteed to win money. How much do you win regardless of the outcome? (Report your answer without the $ symbol.)

1

Correct Response

-4 + 5 if rain or overcast, 6 - 5 if sunny

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1 / 1
points

8.
Dutch book:

Apparently your friend doesn't understand the laws of probability. Let's examine the bets he offered.

1. For bet (i) to be fair, his probability that it rains or is overcast must be .6 (you can verify this by calculating his expected return and setting it equal to $0).
2. For bet (ii) to be fair, his probability that it will be sunny must be .5.

- This results in a "Dutch book" because your friend's probabilities are not coherent. They do not add up to 1. What do they add up to?

1.1

Correct Response
0.6 + 0.5