hw3_games_q9_rationality_of_utilities

Question 9: Rationality of Utilities

0.0/3.0 points (graded)

Part 1

Consider a lottery $L = [0.2, A; 0.3, B; 0.4, C; 0.1, D]$, where the utility values of each of the outcomes are $U(A) = 1, U(B) = 3, U(C) = 5, U(D) = 2$. What is the utility of this lottery, $U(L)$?

3.3	**Answer:** 3.3

$$U(L) = 0.2 * U(A) + 0.3 * U(B) + 0.4 * U(C) + 0.1 * U(D) = 3.3$$

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ℹ Answers are displayed within the problem

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problem

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Part 2

Consider a lottery $L1 = [0.5, A; 0.5, L2]$, where $U(A) = 4$, and $L2 = [0.5, X; 0.5, Y]$ is a lottery, and $U(X) = 4, U(Y) = 8$. What is the utility of the the first lottery, $U(L1)$?

5	**Answer:** 5

$$U(L2) = 0.5 * U(X) + 0.5 * U(Y) = 2 + 4 = 6$$
$$U(L1) = 0.5 * U(A) + 0.5 * U(L2) = 2 + 3 = 5$$

ℹ Answers are displayed within the problem

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problem

0.0/3.0 points (graded)
Part 3
Assume $A \succ B$, $B \succ L$, where $L = [0.5, C; 0.5, D]$, and $D \succ A$. Assuming rational preferences, which of the following statements are guaranteed to be true?

- ☑ $A \succ L$ ✔
- ☑ $A \succ C$ ✔
- ☐ $A \succ D$
- ☑ $B \succ C$ ✔
- ☐ $B \succ D$

a) $A \succ B \succ L$, so by transitivity $A \succ L$

b)
$A \succ L \implies A \succ D \vee A \succ C$. Because $D \succ A$, then $A \succ C$ must be true.

c)
$D \succ A$ means this is false.

d)
$D \succ A \succ B \implies D \succ B$, so for the same reasoning as (b) this is true

e)
$D \succ A \succ B \implies D \succ B$, means this is false.

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ⓘ Answers are displayed within the problem