


Feedback — In-Video Quizzes Week 6

You submitted this quiz on **Tue 12 Feb 2013 12:59 PM CET**. You got a score of **3.00** out of **3.00**.

Question 1

6-2 Coalitional Game Theory: Definitions

Suppose $N = 3$ and $v(1) = v(2) = v(3) = 1$. Which of the following payoff functions is superadditive?

| Your Answer | Score | Explanation |
|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------|
| <input checked="" type="radio"/> b) $v(1, 2) = 3, v(1, 3) = 4, v(2, 3) = 5, v(1, 2, 3) = 7$; |  1.00 | |
| Total | 1.00 / 1.00 | |

Question Explanation


(b) is true.

- Use the definition of superadditivity to check that (b) is the answer.
- (a) is not superadditive because $5 = v(2, 3 \cup 1) < v(2, 3) + v(1) = 5 + 1$.
- (c) is not superadditive because $0 = v(1 \cup 2) < v(1) + v(2) = 1 + 1$.

Question 2

6-3 The Shapley Value

Suppose $N = 2$ and $v(1) = 0, v(2) = 2, v(1, 2) = 2$. What is the Shapley Value of both players?

| Your Answer | Score | Explanation |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------|
| <input checked="" type="radio"/> d) $\phi_1(N, v) = 0, \phi_2(N, v) = 1$ |  1.00 | |
| Total | 1.00 / 1.00 | |

Question Explanation

(d) is true.



- Use the definition of the Shapley Value to compute its value for each player.
- Another way to find the Shapley Value is to notice that player 1 is a dummy player:
 - when added to the unique coalition 1, 2, player 1's contribution is 0.
 - By the theorem presented in the lecture, the Shapley Value satisfies the Dummy player axiom. Then, $\phi_1(N, v)$ must be 0.

Question 3

6-4 The Core

- Suppose $N = 3$ and $v(1) = v(2) = v(3) = 0$,
 $v(1, 2) = v(2, 3) = v(3, 1) = 2/3$, $v(1, 2, 3) = 1$.

Which allocation is in the core of this coalitional game?

| Your Answer | Score | Explanation |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------|
|  c) (1/3, 1/3, 1/3); |  1.00 | |
| Total | 1.00 / 1.00 | |

Question Explanation

(c) is true.

- By definition, the core of this game is formed by a triplet $(x_1, x_2, x_3) \in R_+^3$ that satisfies:
 - $x_i + x_j \geq 2/3$ for $i \neq j$
 - $x_1 + x_2 + x_3 \geq 1$
 - Then, the core is a singleton with $(x_1, x_2, x_3) = (1/3, 1/3, 1/3)$.