**The problem:**

At a marketplace there are 2 proeminent fruit vendors, Bob and Alice. They compete for customers and thus for market share. Each day both Bob and Alice must simultaneously choose to sell one fruit and one fruit only. Both can sell apples, bananas and oranges and want to maximize their profit but are affected by the others decision. Below is the payoff matrix outlining the potential outcomes for each player based on their strategic choices. What is the difference between Bob’s payoff and Alice’s payoff?

|  |  |  |  |
| --- | --- | --- | --- |
| Game table | Alice (apples) | Alice (bananas) | Alice (oranges) |
| Bob (apples) | -3 | -2 | 6 |
| Bob (bananas) | 2 | 0 | 2 |
| Bob (oranges) | 5 | -2 | -4 |

**Solution:**

What you want to do is select the minimum value for each row (i.e., minimum row value) and the maximum value for each column (i.e., maximum column value).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Game table | Alice (apples) | Alice (bananas) | Alice (oranges) | Minimum values |
| Bob (apples) | -3 | -2 | 6 | -2 |
| Bob (bananas) | 2 | 0 | 2 | 0 |
| Bob (oranges) | 5 | -2 | -4 | -2 |
| Maximum values | 5 | 0 | 6 |  |

Then you want to determine the minimum of the maximum vaues in the maximum values row (i.e., minmax). In this example this is 0. Additionally, you want to determine the maximum value out of the minimum values in the minimum values column (i.e., maxmin). In this example this is 0.

Therefore, Bob and Alice will both choose to sell bananas resulting in a payoff of 0 for both. As a result, the difference between their payoffs is 0. A game with a fair value of 0 is also considered a fair game.