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10/31/2017

SI301/Romero

Assignment 7

1. print(min(abs(a-b),abs(c-d)))

When there is no perfect matching in a preferred sellers graph, with two buyers, there must be a constricted set of two buyers for one seller. To get a perfect matching, one buyer’s payoff (valuation – price) must be equal, so that this buyer is indifferent between the two sellers. This occurs when the price increments abs(a-b) or abs(c-d) times, because the price increments by one unit every time. To get the smallest number of increments for a perfect matching, take the min() of these two options (abs(a-b) and abs(c-d)).

1. Textbook questions 11 and 14

11.

a.) The sellers in this question would be the owners of the parking spaces, represented by the letters denoting the spaces themselves (a,b,c). The buyers are those looking to rent a parking spot (x,y,z). The valuations for each buyer are below:

x: (6,5,2)

y: (7,6,3)

z: (6,7,6)

b.) Prices at the end of each auction round

|  |  |  |  |
| --- | --- | --- | --- |
| Parking / Round | 1 | 2 | 3 |
| a | $0 | $1 | $2 |
| b | $0 | $0 | $1 |
| c | $0 | $0 | $0 |

Final Market-Clearing Prices: {a = 2, b = 1, c= 0}

c.) The prices seem to be good evaluations of the attractiveness of each house for each renter. When the prices for each house were 0, two buyers wanted a, one wanted b, and none wanted c. This happens to be the market-clearing prices for each respective house. While this does not occur in every market auction, it shows that the prices are well fit to the buyers’ desires for each house.

14.

a.)

|  |  |  |
| --- | --- | --- |
| Buyer | Value for a’s house | Value for b’s house |
| X | 0 | 3 |
| Y | 1 | 5 |

Social welfare maximizing perfect matching = {a-x,b-y}

Baseline-maximizing matching = {a-y,b-x}

b.) No, the claim that there is always a set of market clearing prices so that the resulting preferred-seller graph contains a baseline-maximizing perfect matching is not true. For any equal-sized sets of sellers and buyers, there is always a set of market clearing prices resulting in a social-welfare maximizing perfect matching. Part a’s example shows this. And, there is no perfect matching in part a that is baseline maximizing. So, part a. shows a contradiction of this claim and, therefore, the claim is not true.