Using the cost equation(obtained by rearange the PN equation) we caculate 15 costs from the 15 prices in AER paper’s code. Now we have 15 costs. Note that it is a ONE-to-One mapping from cost to price. If cost=1 is not in the list, we should replace the one closest to 1 with 1.

We first the cost at 1, that is, the true cost is 1 throught this code.

Second, we add an arbitration stage in AER paper’s code as follows.

Each firm is required to report one cost out of the possible 15 costs.

If the two firm report the same cost, we caculate the profit using AER’s formula(note that cost=1 and price is caculated based on the reported cost);

otherwise, each firm is asked to report cost again.

We calculate the monoply price using the PM equation based the 15 costs. It is also a ONE-to-ONE.

We then implement the following payoff

0.5 chance the monoply payoff for firm 1 given firm 1’s second report(price is based on the reported cost), and 0.5 chance 0;

0.5 chance the monoply payoff for firm 2 given firm 2’s second report(price is based on the reported cost), and 0.5 chance 0.

Penalty and rewards:

Both firms are penalized by 10.

if firm 1’s first report is the same as firm 2’s second report is PM, firm 1 is rewarded by 10(I guess 10 is enough for the bound); otherwise firm 1 is penalized by 10;

if firm 2’s first report is the same as firm 1’s second report is PM, firm 2 is rewarded by 1); otherwise firm 2 is penalized by 10;

Cost equation from PN:

###We calculate 15 costs:

We can write the cost as a function of price:

It is a one-to-one mapping. Hence, with the price range in AER paper, we can have 15 different costs. The range can be found on p. 3274 in AER paper, we need to find the exact price in AER code. Here, we need to add a Betrand price with cost=1 in case the price range in AER does not include that price(cost=1).

Monoply price:

###We cacluate the price for monoply with cost =1.

We can calcuate the optimal price for one firm, by setting n=1. We have pm

In particular, when the cost=1, pm=