

08.07.2013

Simulation Notes

When running the simulation where the probability of buying only includes the price and not the distance from the good demanded the producer selling goods for the cheapest only wins consistently if the good demanded isn't random.

LIGHTBULB

I remember why now. Average price is a deceiving metric to look at when seeing which producer makes the most profits. Because sometimes the random good demanded may very well choose a good that the producer with the higher average price of goods sells for cheaper. So there's a chance the producer selling goods near 0.5 is selling them on average for lower while the entire average is actually higher.

So the key is to look at who is selling the good closest to 0.5 for cheaper.

DISCOVERY

If you check for average price of goods as well as price of the good closest to 0.5 that each producer has in its inventory the producer selling good 0.5 for cheapest will win the profit war which is exactly what we are looking for. So our model is confirmed to work under these conditions (I was simply looking at the wrong metric - whoops).

EVEN MORE ACCURATE

You have to calculate the average good demanded and then check the price of the good closest to the average good demanded within the inventory of each

producer (which is usually about 0.5 but not exactly).

WAIT...NO...WHAT?

Okay so...that's not exactly correct. There's still some source of variation that I'm not understanding entirely. However, if I check for the price of the good in each producers inventory that's closest to the average good demanded **AND** I keep the good demanded each turn constant, **THEN** the producer selling the good closest to the average good demanded for the cheapest wins out.

At this point I've even added distance back into the mathematical model that we're using to calculate probabilities but I've kept the goodIDs for both producers the same.

CONFIRMED

The above assumption has been confirmed. This means that the additional variation comes specifically from the random choosing of a good per turn per consumer. Why this happens I'm not sure of yet.

Here is the console print out:

```
////////////////////////////////////  
Input parameters are:
```

```
SIMLENGTH = 100 NUMGOODS = 100 NUMCONSUMERS = 1000  
PERCENTFACTORY = 0.1
```

```
////////////////////////////////////  
Results:
```

```
100.0% of the time the producer with the most profits also had the highest  
average price
```

```
Simulation took 194.060403 seconds to run!  
////////////////////////////////////
```

BEGIN PROTOTYPE_2.py

I've saved prototype_1.py and am keeping it as is. Now I've updated to prototype_2.py and have added the ability to increase the number of producers from 2 to as many as is needed. GoodIDs are still being kept constant while I explore the currently misunderstood variability of generating a random good demanded by each consumer.

TODO

Need to figure out the variation being caused by choosing a random good per consumer...