HW 8.6

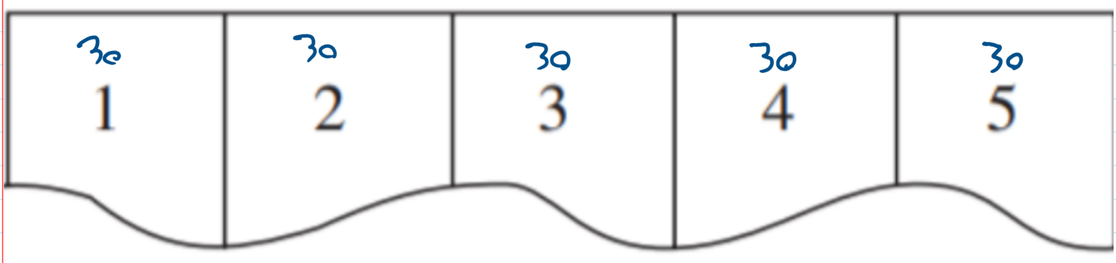
Sunday, September 20, 2020 4:28 PM

Passed solution review

Consider a location game with five regions on the beach in which a vendor can locate. The regions are arranged on a straight line, as in the original game discussed in the text. Instead of there being two vendors, as with the original game, suppose there are *three* vendors who simultaneously and independently select on which of the five regions to locate. There are thirty consumers in each of the five regions; each consumer will walk to the nearest vendor and purchase a soda, generating a $1.00 profit for the vendor. Assume that if some consumers are the same distance from the two or three nearest vendors, then these consumers are split equally between these vendors.

(a) Can you rationalize the strategy of locating in region 1?

(b) If your answer to part (a) is "yes," describe a belief that makes locating at region 1 a best response. If your answer is "no," find a strategy that strictly dominates playing strategy 1.



max rev = 30 · 5 · 1 = 150

a) It's never the best strategy to locate in region 1 unless it holds value in a different way (ATM, picnic tables, etc) or if it is guaranteed that all players choose region 1

b) No: location 3 would dominate because it is in the middle and can draw both sides
Yes: If there are other amenities that would draw more people to region 1, you would need to get at least 2a extra people

A mix of 2 & 3, $\sigma_i = (0, p, 1-p, 0, 0)$ dominates 1. Tedious to show

2 & 3 each weakly dominate 1. So, the mix strategy dominates 1.

3 chose s = 1

1 \ 2	1	2	3	4	5
1	50	15	25	40	55
2	15	30	30	30	30
3	25	30	40	45	45
4	40	30	45	70	75
5	55	30	45	75	100

3 chose s = 2

1 \ 2	1	2	3	4	5
1	120	60	30	45	75
2	60	50	30	40	55
3	30	30	60	60	60
4	45	40	60	70	75
5	75	55	60	75	100

3 chose s = 3

1 \ 2	1	2	3	4	5
1	100	90	65	45	60
2	90	90	45	30	45
3	65	45	50	45	55
4	45	30	45	90	90
5	60	45	55	90	100