Priority Line Mechanism: An Example

Suppose there are four people: 1, 2, 3, 4 and four houses A, B, C, D. Preferences are:

       1: A > B > C > D
       2: B > C > A > D   Owns A
       3: C > A > D > B   Owns D
       4: A > C > B > D

To begin, house B and C are vacant. The priority order is 1, 2, 3, 4.

<u>Priority Line Algorithm</u>

Under the priority line algorithm, individuals pick in oder of their priority and point to a house. If vacant, they take it. If occupied, the owner goes to the front of the line and picks a house. If a cycle forms, we clear it and continue.

- 1 chooses first and wants A, owned by 2. So 2 gets to jump ahead in line.
- 2 chooses B, which is vacant. (2,B) is cleared. Now A is vacant.
- 1 chooses A, now vacant. (1, A) is cleared.
- 3 chooses C, which is vacant. (3, C) is cleared.
- 4 takes D, the only house left. (4, D) is cleared.

Final match is (1,A), (2,B), (3,C), (4,D).

<u>Equivalent Top Trading Cycles Approach</u>

This runs like regular TTC, except that at every round, vacant houses all point to the remaining person with highest priority.

Round 1: Vacant houses B, C. Here is the pointing…
       1 -> A   A -> 2 (2 owns A)
       2 -> B   B -> 1 (1 is highest priority)
       3 -> C   C -> 1 (1 is highest priority)
       4 -> A   D -> 3 (3 owns D)

The cycle is 1->A ->2 ->B ->1. So we clear (1,A) and (2,B).

Round 2: Vacant house C.
       3 -> C   C -> 3 (3 is highest remaining priority with 1,2 gone)
       4 -> C   D -> 3 (3 owns D)

The cycle is 3 -> C -> 3. So we clear (3, C).

Round 3: only (4,D) are left, clear them. Same outcome as Priority Line!