**Micro Midterm Notes**

NTU Matching:

* Positive-Assortative Matching (PAM): The derivative of each side’s payoff function has the same sign
* Negative-Assortative Matching (NAM): The derivative of each side’s payoff function has the opposite sign
* Gale-Shapley Theorem:
  + Male-pessimal outcome is the female-optimal outcome, and vice versa
  + If male-pessimal and male-optimal outcomes are the same, then the stable matching is unique
  + The DAA can take no more that rounds, where there are men and women
* Diagram

  Description automatically generatedSolving DAA algorithm in discrete case: Example from first question of 2020 midterm below

Welfare Theorems of Matching:

1. A competitive equilibrium yields an efficient matching
2. An efficient matching is a competitive equilibrium for a suitable set of wages

TU Matching:

* PAM: Supermodular
  + If differentiable, cross-derivative is positive
  + If not differentiable, increasing differences
* NAM: Submodular
  + If differentiable, cross-derivative is negative
  + If not differentiable, decreasing differences

Finding wages:

* Differentiable case:
  1. Let be the profit function for matchmakers in this market, where is the output of a match. Find FOC for one side of the market
     + (if FOCs aren’t symmetric, repeat steps 1-3 for other side of market)
  2. If PAM, solve FOC for first derivative of wage function using . If NAM, solve using .
  3. Take antiderivative to determine wage function, including some constant, . Let be the constant for the other side’s wage function
  4. Impose free entry/exit condition to let at its maximum; solve for the relationship between and .
  5. Suppose . Then, and the range of market-decentralizing wages is given by the range of such that the wage of each side is weakly greater than the side’s outside option
     + In the typical case where the value of not matching for each side is zero,
     + Suppose is the cost of matching for the side. Then
     + If there is a short side of the market, pin wages down uniquely by setting and such that the short side captures all surplus. For example, if the mass of type exceeds that of type , then , .