

# Bipartite Matching Optimizer

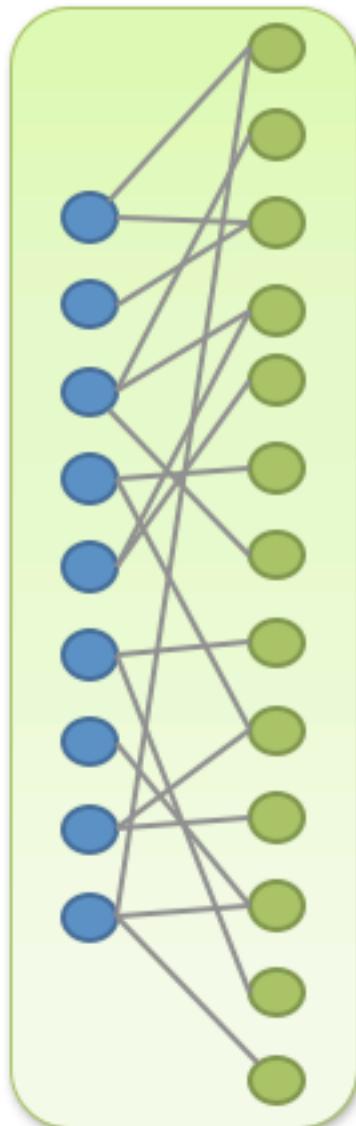
## 1. Get seed solution



● Rideshares  
● Unmatched riders

— Unmatched edges  
— Matched edges

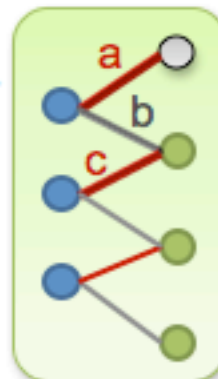
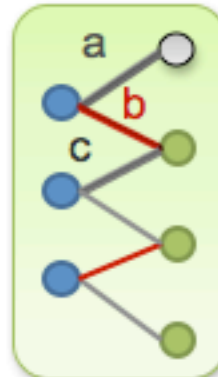
2. Connect compatible riders and rideshares with unmatched edges. (Read "Compatibility – Can I Add This Rider?" to see how we do this)



3. For a random unmatched rider, check if there is an augmenting path leading from that rider.

An augmenting path is a path that begins and ends with unmatched edges.

Such a path allows us to add one edge to the matching, since the number of unmatched edges is one greater than the number of matched edges.

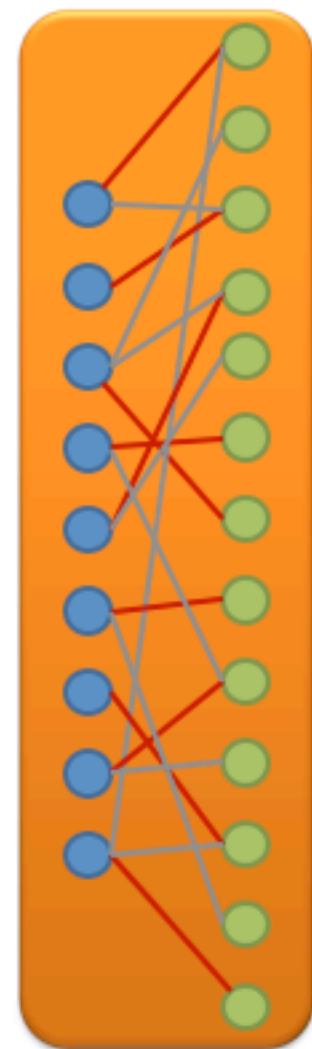


The path **a->b->c** is an augmenting path. It allows us to remove **b** and add **a** and **c** to the matching.

4. Exchange all unmatched and matched edges on the augmenting path.

5. Repeat 3-4 until all unmatched riders have been tried.

This produces a maximal matching:



6. Add all matched riders to their rideshares.

7. Repeat 2-6, until no more augmenting paths exist.