COMP 3711 – Spring 2019
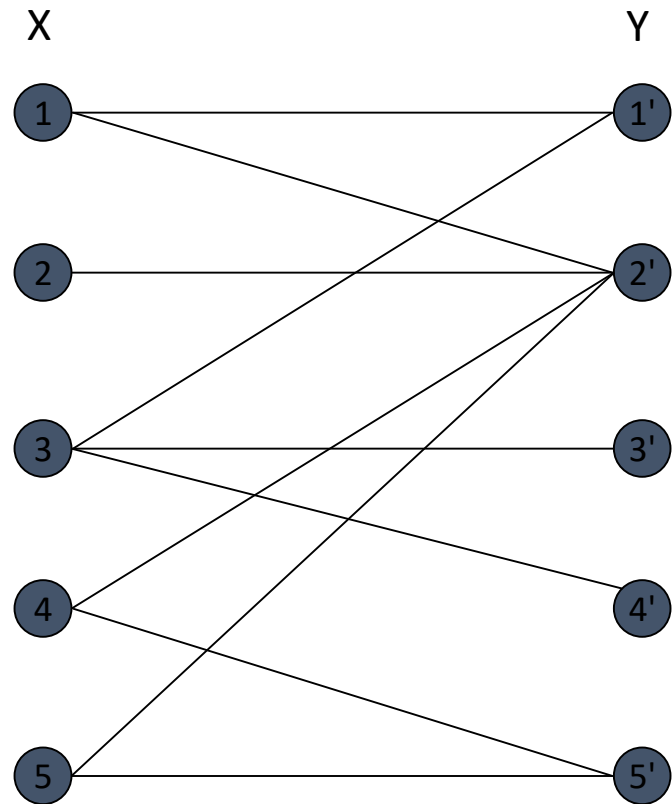# Tutorial 11 -- Problems

Bipartite Matching Example

X   Y

1   1'
2   2'
3   3'
4   4'
5   5'

Find a
Maximum Bipartite Matching
in the graph using the
Max-Flow Method
taught in class

The Taxi Problem

- Consider a taxi company that has received many reservations
- It wants to calculate the minimum number of taxis it will need to service all of those requests. How can it do this?

- More specifically, you are given n taxi reservations $r_1, r_2, ..., r_N$.

- For every pair of reservations r_i, r_j you are told if the same taxi can first satisfy reservation r_i and then go on to satisfy reservation r_j

- Find the minimum number of taxis needed to satisfy all of the reservations.

Stable Matching Example

Man	1st	2nd	3rd	4th
A	c	a	b	d
B	a	d	c	b
C	d	a	b	c
D	d	b	a	c

Woman	1st	2nd	3rd	4th
a	B	D	C	A
b	A	C	D	B
c	B	D	C	A
d	A	D	C	B

Find Stable Matchings based on the above preference lists.

1. What is the Man-Optimal matching?

2. What is the Woman-Optimal matching

3. Are they the same?

AVL Example

- Construct an AVL tree by inserting the items 1 3 4 6 2 5 in that order. Next construct another AVL tree on those items by inserting in the order 1 2 3 4 5 6.

  Do the two trees have the same height?

- Now construct an AVL tree by inserting the items 5 3 6 2 4 7 1 in that order and another by inserting 4 2 6 1 3 5 7 in that order. Do those two trees have the same height?

- What are the minimum and maximum heights for an AVL tree with 88 nodes labelled 1,2,3,…,88?