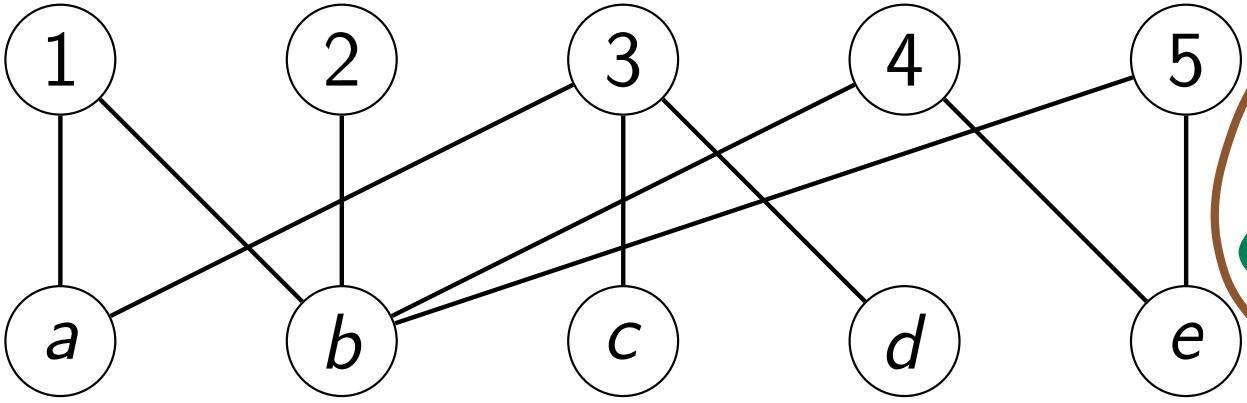
CompSci 161
Winter 2023 Lecture 22:
Greedy Algorithms On Trees

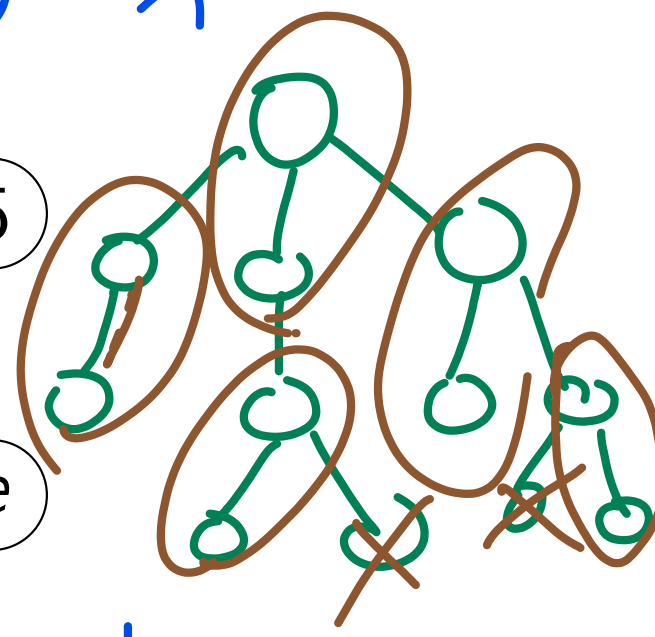
Maximum Matching

Can every puppy be adopted?



no

Tree:



c, d : only one house

but two dogs

max one dog per house.

Maximum Matching

- In general: complicated algorithms, solvable
- In a tree: less complicated algorithm, solvable

Tree: $n-1$ edges $\sum \delta(v) = 2(n-1)$

must be a leaf.

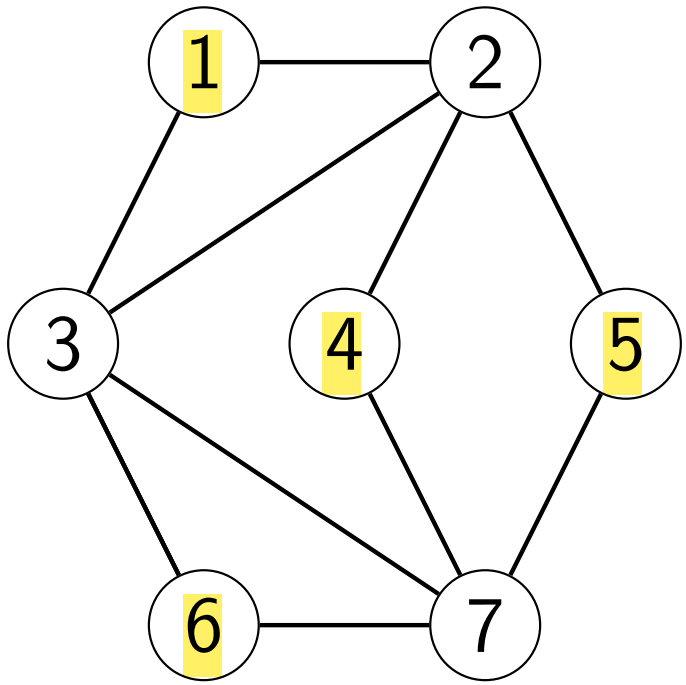
Base: $n \leq 1$, return zero

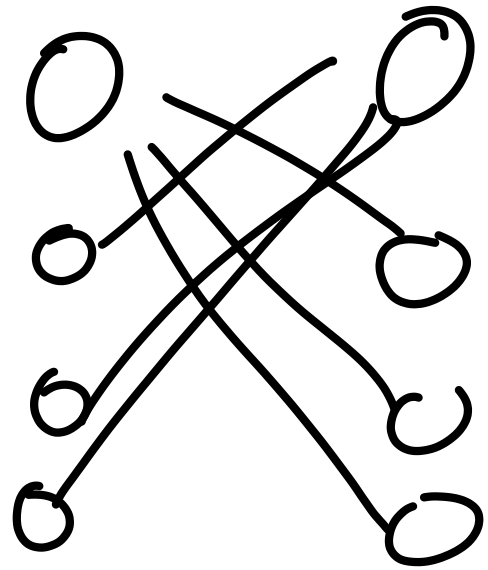
Leaf First: pick a leaf. match w/ neighbor

remove both. Recurse on all components

Independent Set

Find an independent set of size 4 in this graph:





Max Independent Set On Tree

Coming Soon

- Tonight!
  - Interval Coloring
  - Wrapping up Greedy Algorithms
- Monday in lecture
  - Closest pair of points D&C
- Monday evening
  - Dynamic Programming Review
  - Problems TBD