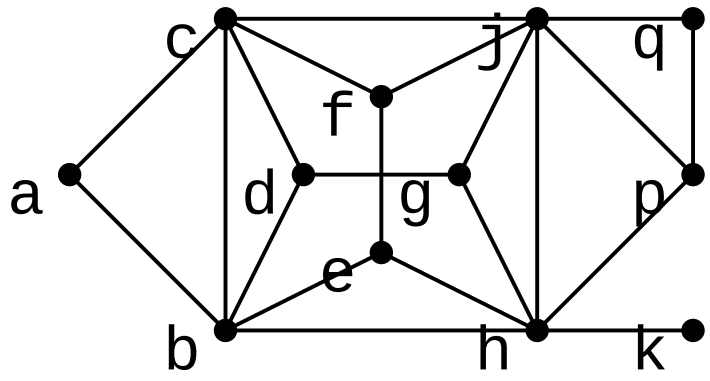
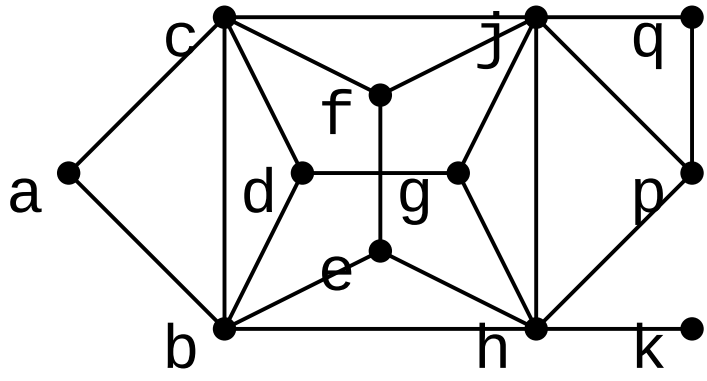


k-independent set (k-IS)

* instance graph G
  query independent set size k?

* also called max IS problem (why?)

* NP-complete (from k-clique)



find max IS?

* NP-complete :(
* restrict instances ?
* trees? k-IS in P :)

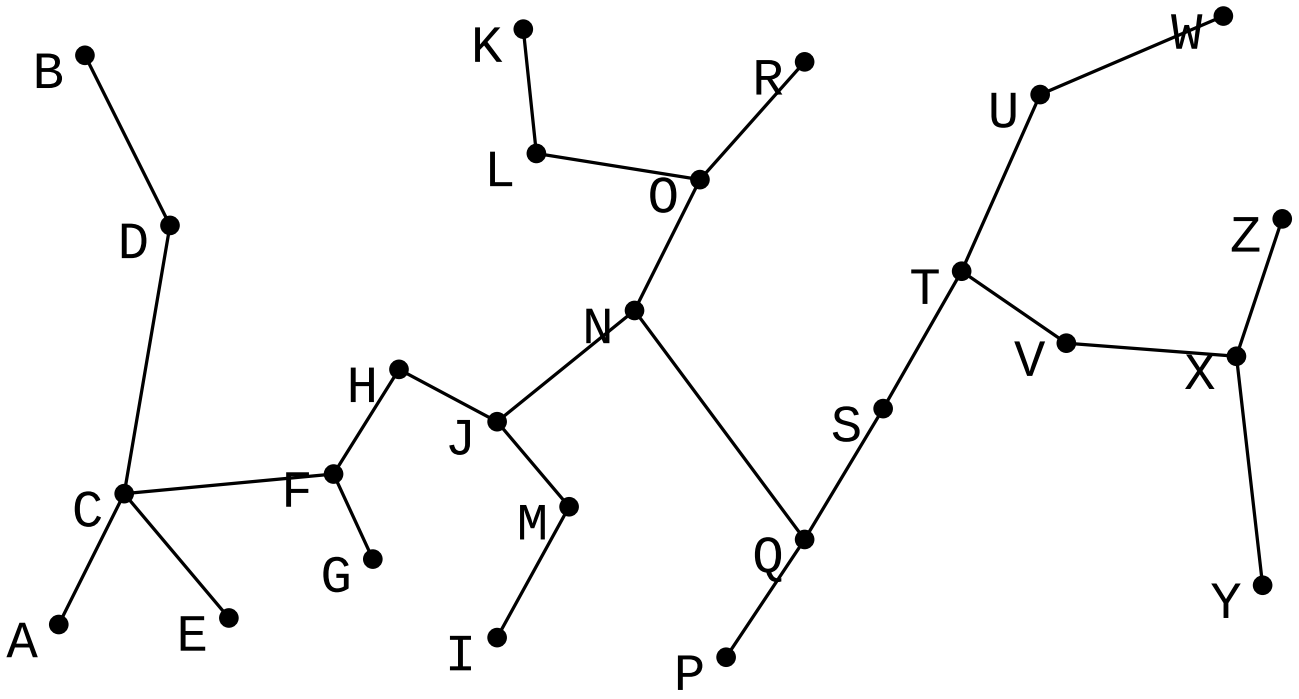
- dynamic programming ?

- forest has isolated node (0 nbrs) or leaf (1 nbr)

- this works (woo hoo :)

- this generalizes

leaf => simplicial node: nbrhood is clique

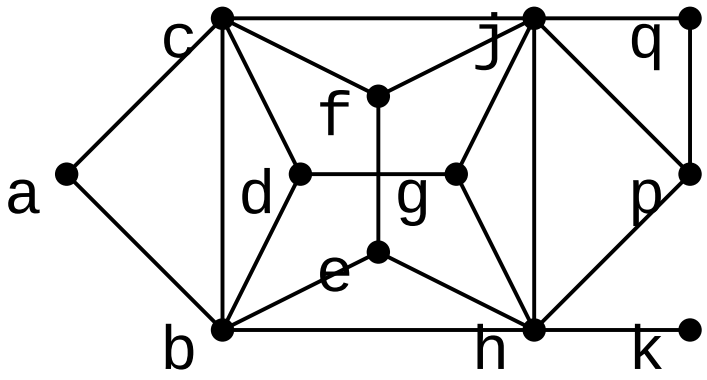


find max IS?

* dynamic programming ?

* lemma: for each leaf x,

maxIS(T) = {x} U maxIS(T - x - nbrhood(x))

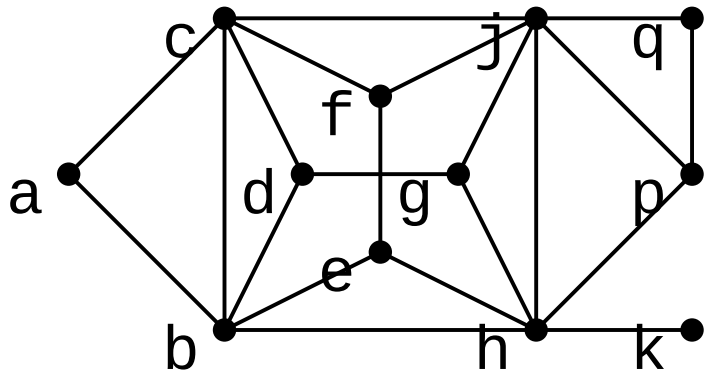


find max IS?

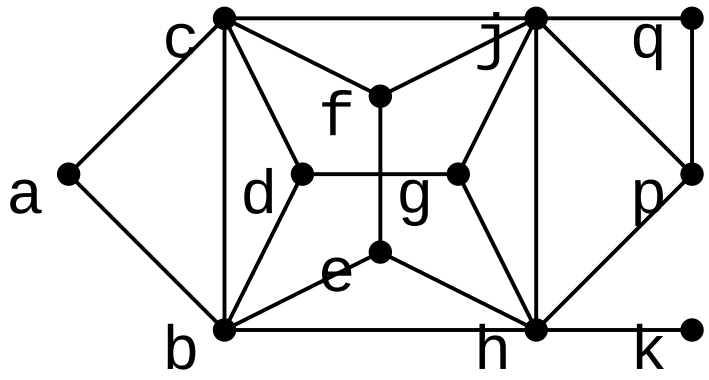
* dynamic programming ?

* lemma: for each simplicial node y,

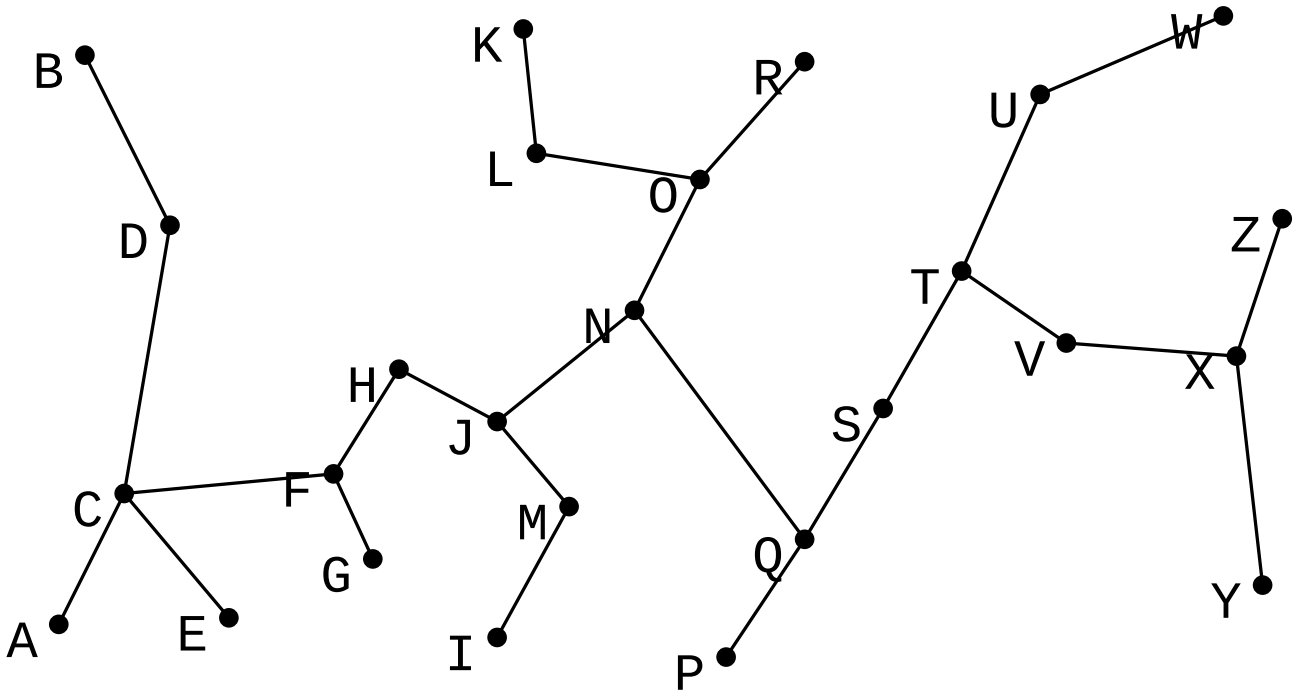
maxIS(T) = {y} U maxIS(T - y - nbrhood(y))




```
dpIS(G, ISsofar)

  if G has simplicial node v:

    ISsofar <- ISsofar U {v}

    G <- G - v - nbrhood(v)

    return dpIS(G, ISsofar)

  return ISsofar U bruteForceIS(G)


IS <- { }

return dpIS(G, IS)
```



ISsofar	nodes
{ }	a b c d e f g h j p q k
{ a }	d e f g h j p q k
{ a k }	d e f g j p q
{ a k q }	d e f g
{ a k q d }	e f
{ a k q d e }	



ISsofar	nodes
{ }	a b c d e f g h i j k l m n o p q ... z
{ a }	b d e f g h i j k l m n o p q ... z
{ a b }	e f g h i j k l m n o p q ... z
{ a b e }	f g h i j k l m n o p q ... z
...	...