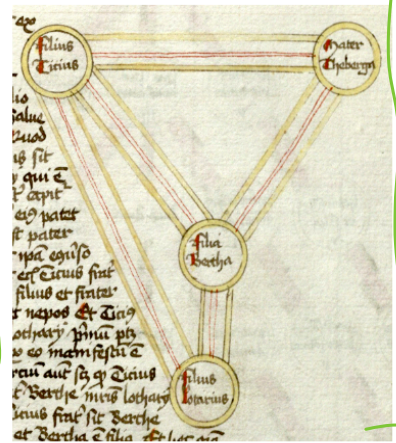
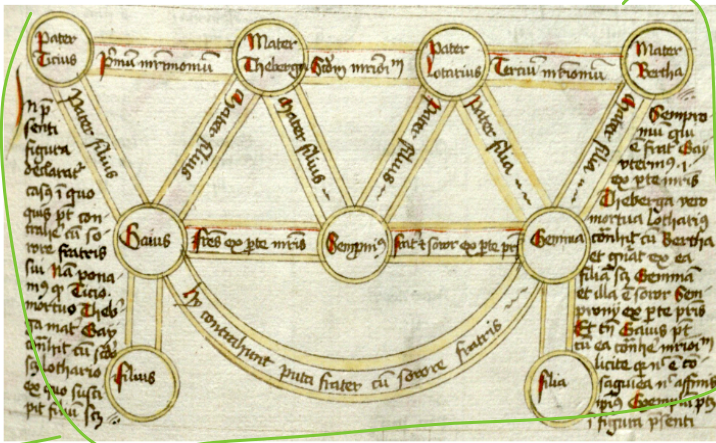
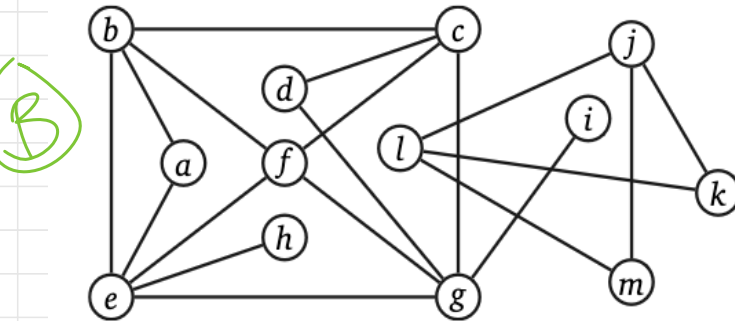
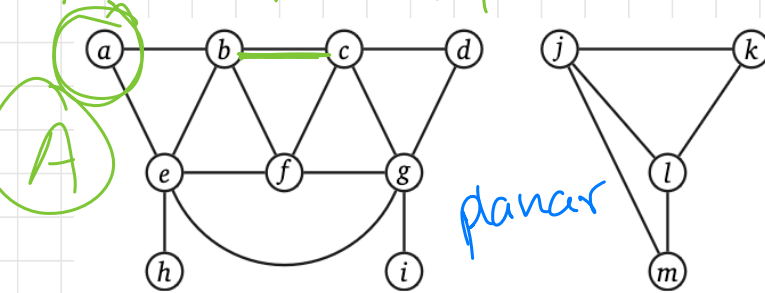




Notation + Representation



vertex / node

V - set of all vertices

E - set of all edges
= pairs of vertices

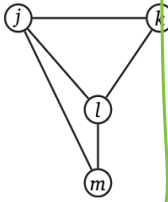
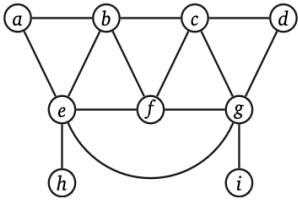
undirected:
 $\{u, v\}$ $uv = vu$

directed:
 $(u, v) \neq (v, u)$
 $u \rightarrow v$

with table:
what is the diff. bwn
graphs A and B?

Adjacency List

$$n = |V|$$



array

a	b	c	d	e	f	g	h	i	j	k	l	m
b	a	b	c	a	e	i	e	g	l	j	m	l
e	e	f	g	b	b	e			m	l	j	j
f	g			f	c	f			k		k	
c	d			g	g	c						
				h		d						

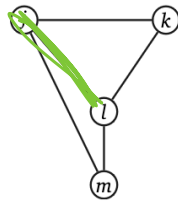
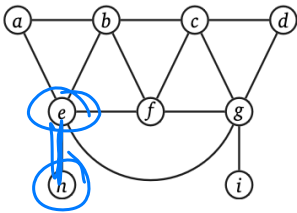
m has $\deg(m)$ neighbors

	exist	$m+x$
uv in E?	$\min(\deg(u), \deg(v))$	$O(1)$
nbs?	$\deg(v)$	$O(V)$
delete	$\deg(u) + \deg(v)$	$O(1)$

$m \in E$

Adjacency Matrix

$$O(|V|^2)$$



vertices

	a	b	c	d	e	f	g	h	i	j	k	l	m
a	0	1	0	0	1	0	0	0	0	0	0	0	0
b	1	0	1	0	1	1	0	0	0	0	0	0	0
c	0	1	0	1	0	1	1	0	0	0	0	0	0
d	0	0	1	0	0	0	1	0	0	0	0	0	0
e	1	1	0	0	0	1	1	1	0	0	0	0	0
f	0	1	1	0	1	0	1	0	0	0	0	0	0
g	0	0	1	1	1	1	0	0	1	0	0	0	0
h	0	0	0	0	1	0	0	0	0	0	0	0	0
i	0	0	0	0	0	0	1	0	0	0	0	0	0
j	0	0	0	0	0	0	0	0	0	1	1	1	1
k	0	0	0	0	0	0	0	0	0	1	0	1	0
l	0	0	0	0	0	0	0	0	0	1	1	0	1
m	0	0	0	0	0	0	0	0	0	1	0	1	0

For both adj list and adj mtrx, what is worst-case runtime:

- check if $uv \in E$
- list neighbors of v
- delete uv

$M[h,e] = 1$
 $M[h,d] = 0$

you can use $\deg(v)$