

get Neighbors (vertex)
 get Edges (vertex)

Represent an undirected graph
 with a directed graph



Simple

$$G = (V, E)$$

list of vertices

list of edges

$$n = |V|$$

$$m = |E|$$

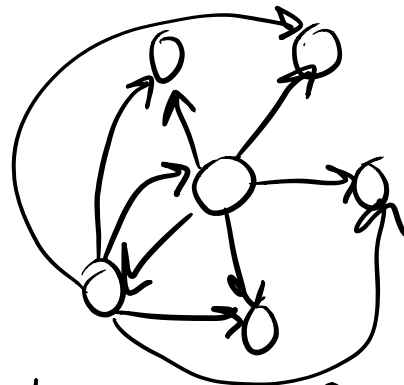
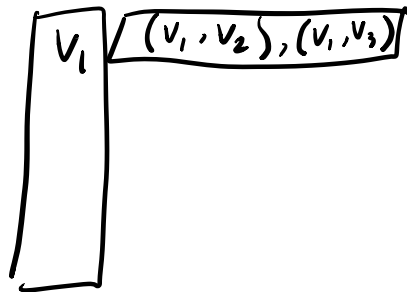
get In Edges

get Out Edges

$$O(m)$$

Adjacency ~~List~~ Dictionary

$$O(n)$$



bound m in terms of n

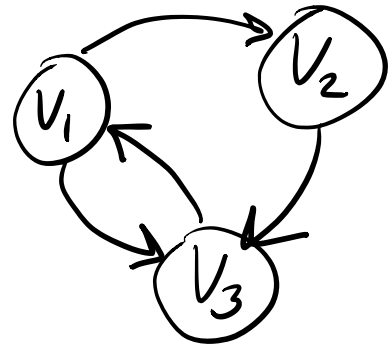
$$n \cdot (n-1) \geq m$$

m is $O(n^2)$

Adjacency Matrix

	v_1	v_2	v_3
v_1	0	1	1
v_2	0	0	1
v_3	1	0	0

n



contains Edge (src, dst)

simple $O(m)$

adj list $O(n)$

adj matrix $O(1)$

Real Adjacency List :

outer Dictionary : ker value
source \rightarrow Dictionary

inner Dictionary : destination \rightarrow Edge