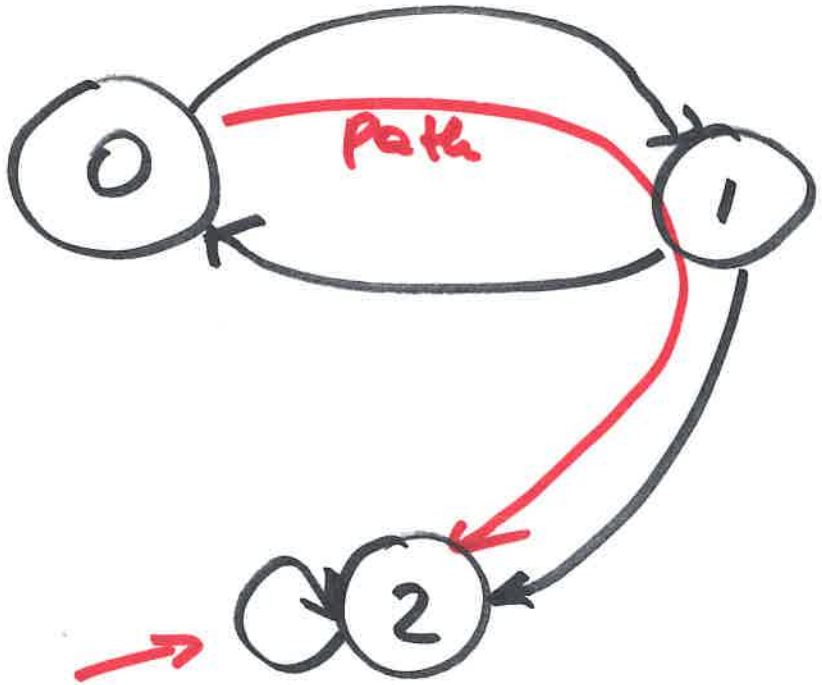
CS 2341

Chapter 9

Graphs

Graph



loop (cycle)

$G = (V, E)$

$V = \{0, 1, 2\}$

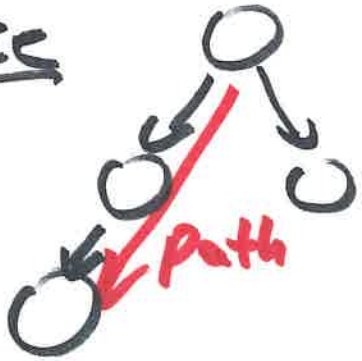
$E = \{(0,1), (1,0), (1,2), (2,2)\}$

tuple representation

space: $O(|E|)$

⇒ • vector of pairs
• hash table of pairs

Tree



Disconnected Graph

Adjacency Matrix

	0	1	2
0	0	1	0
1	1	0	1
2	0	0	1

Space:

$O(|V|^2)$

Sparse matrix: $O(|E|)$

⇒ boost matrix
, boost mapped matrix

Adjacency List

0: 1
1: 0, 2
2: 2

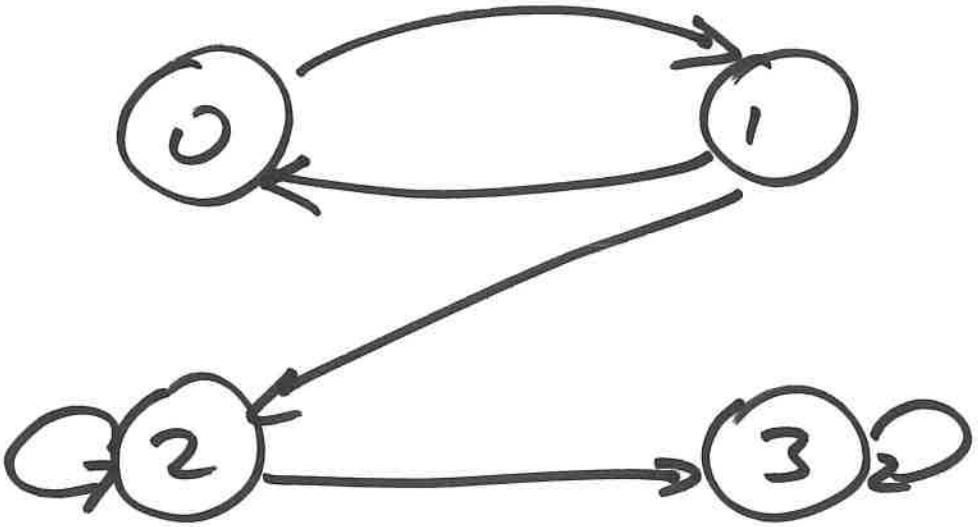
Space:

$O(|E|)$

⇒ vector of lists

Path

Where can you get from vertex 0 with a path of length 3?



You could go:

$0 \to 1 \to 2 \to 3$

$0 \to 1 \to 0 \to 1$

$0 \to 1 \to 2 \to 2$

⋮