

# Graphs



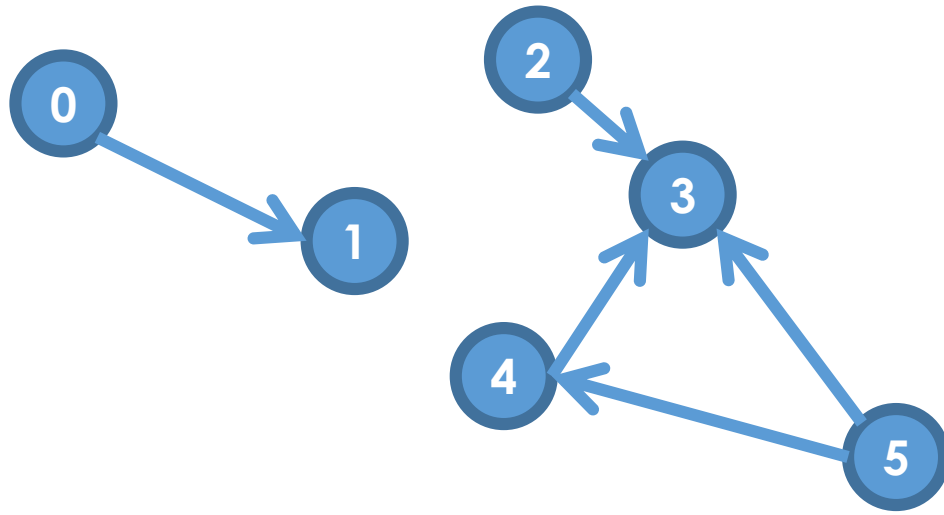
Representation: Finding neighbors



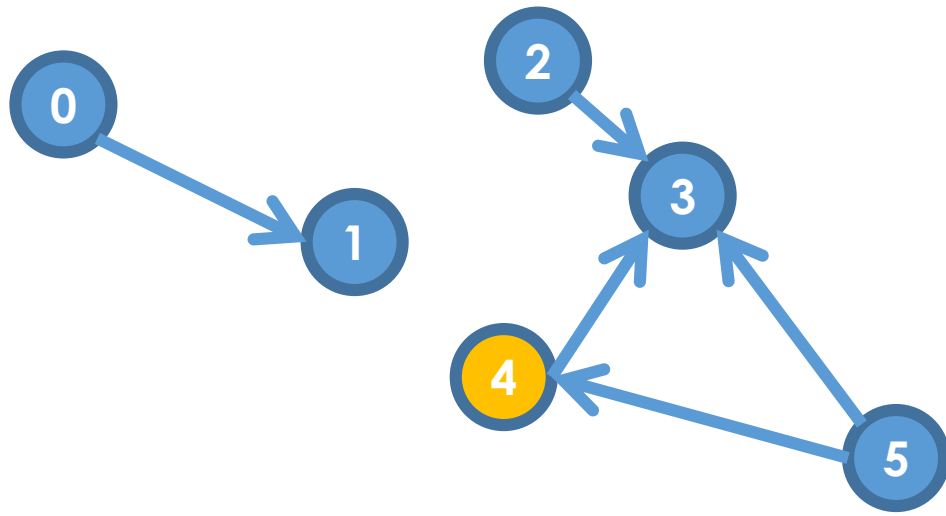
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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.

## By the end of this video you will be able to...

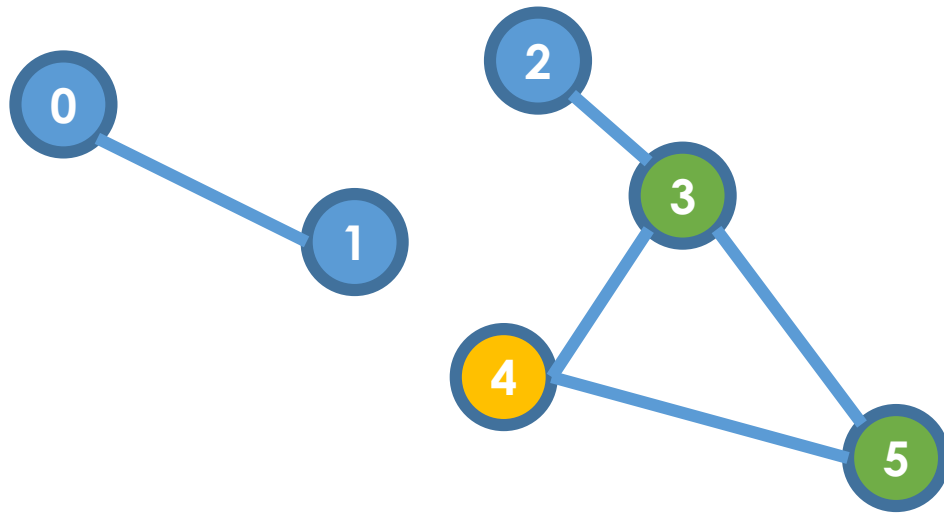
- Implement a method to find the neighbors of a vertex in two ways.
- Evaluate the performance of this method based on the representation.



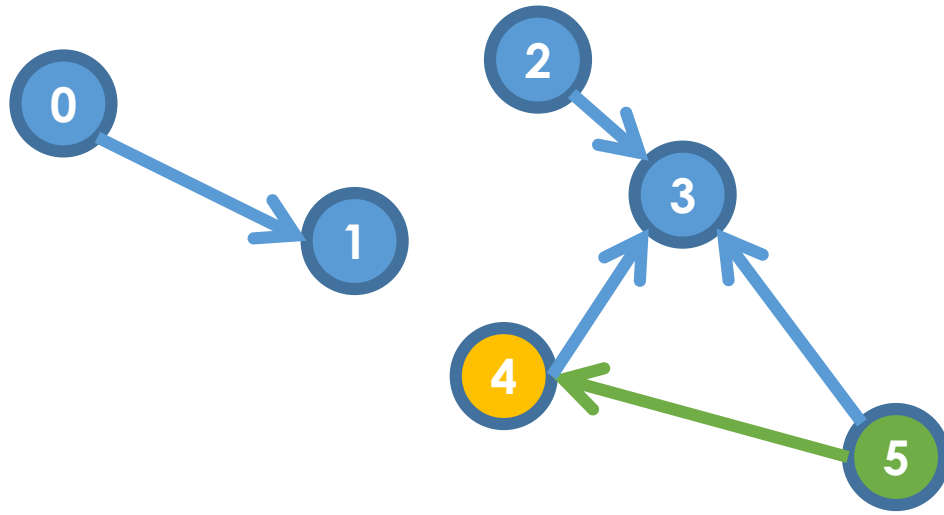
**Neighbors:**  
vertices that are adjacent.



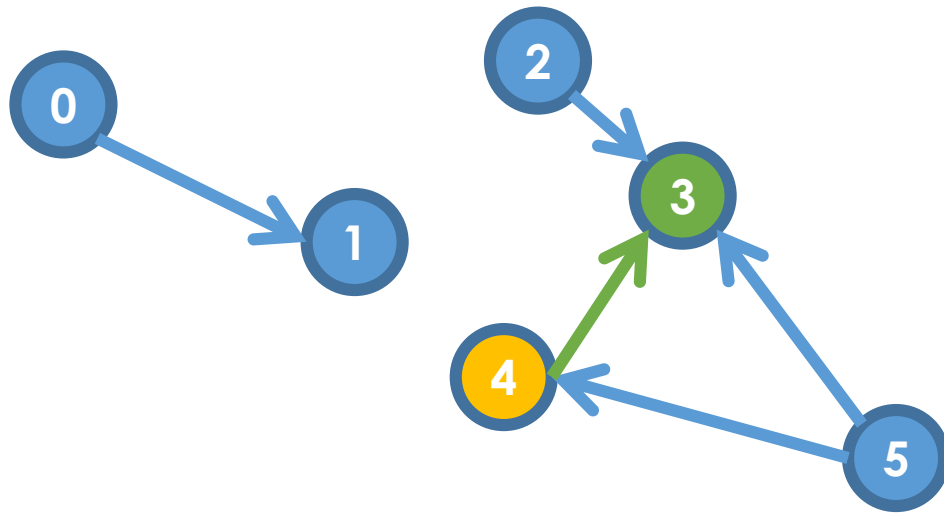
**Neighbors:**  
vertices that are adjacent.



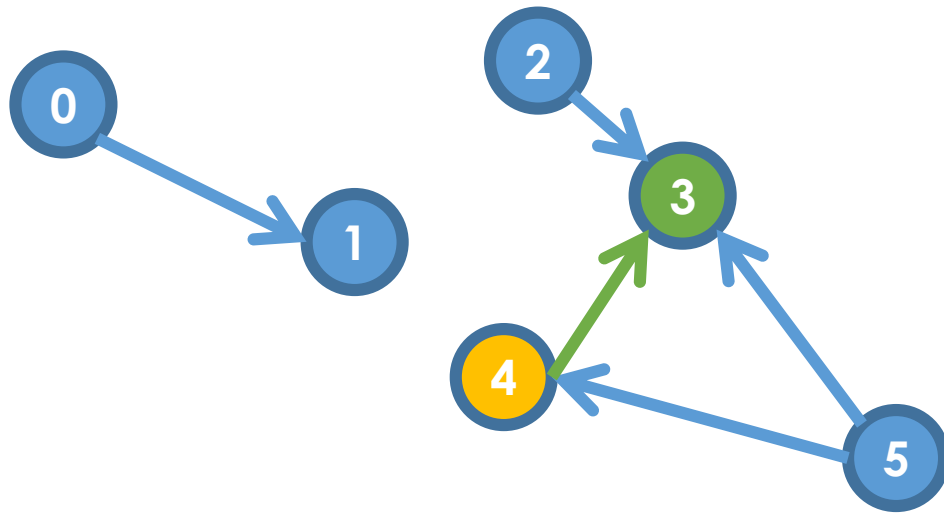
**Neighbors:**  
vertices that are adjacent.



**In degree:  
number of incoming edges.**



**Out degree:  
number of outgoing edges.**

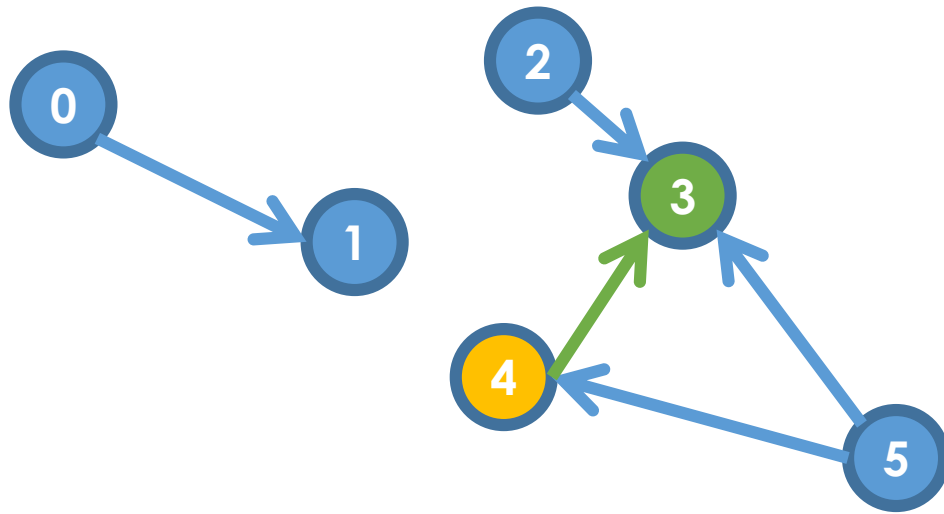


**Out degree:  
number of outgoing edges.**

0	1	0	0	0	0
0	0	0	0	0	0
0	0	0	1	0	0
0	0	0	0	0	0
0	0	0	1	0	0
0	0	0	1	1	0

4





**Out degree:  
number of outgoing edges.**

**$0 \rightarrow \{1\}$**

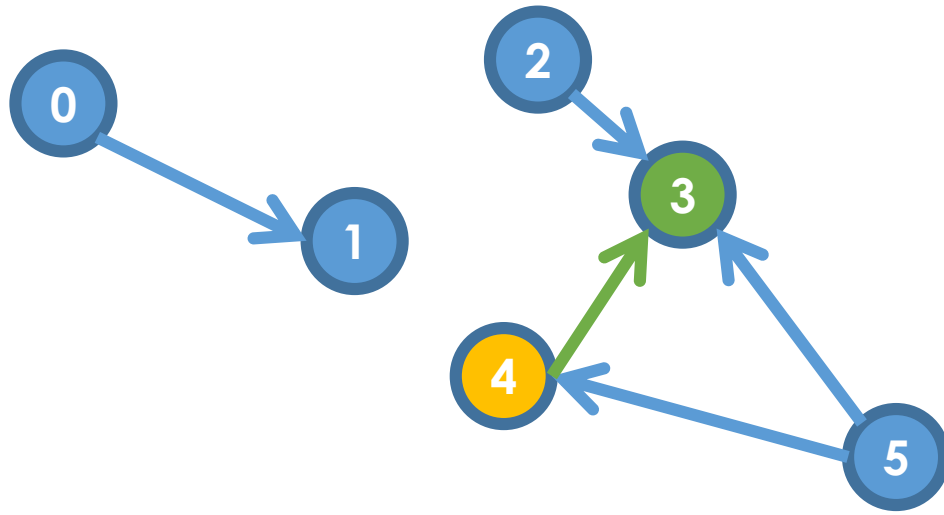
**$1 \rightarrow \text{null}$**

**$2 \rightarrow \{3\}$**

**$3 \rightarrow \text{null}$**

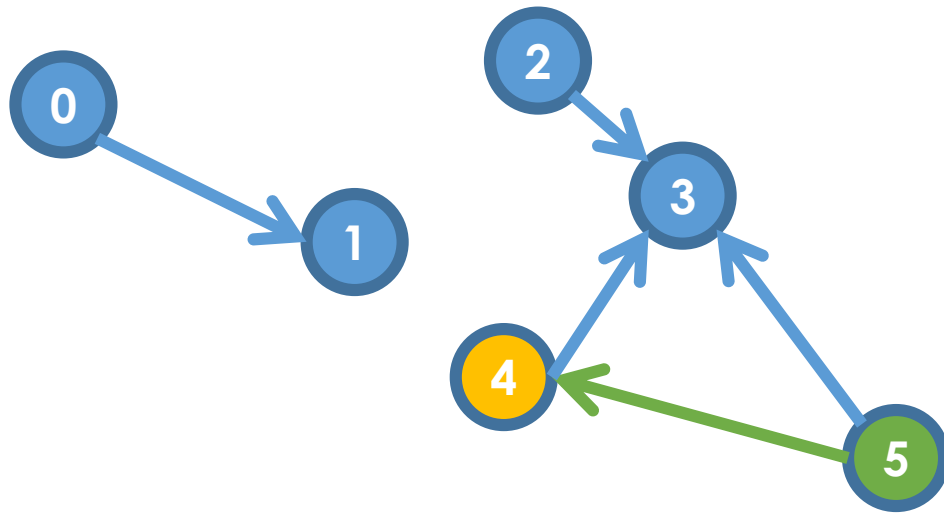
**$4 \rightarrow \{3\}$**

**$5 \rightarrow \{3,4\}$**



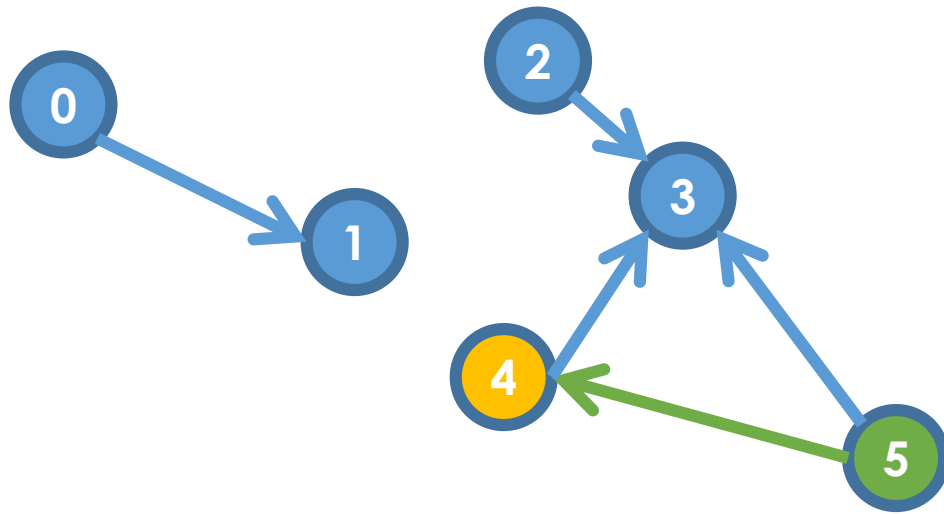
**Out degree:  
number of outgoing edges.**

**IVQ: Which implementation makes finding the out degree more efficient?**



**In degree:  
number of incoming edges.**

0	1	0	0	0	0
0	0	0	0	0	0
0	0	0	1	0	0
0	0	0	0	0	0
0	0	0	1	0	0
0	0	0	1	1	0



**In degree:  
number of incoming edges.**

**$0 \rightarrow \{1\}$**

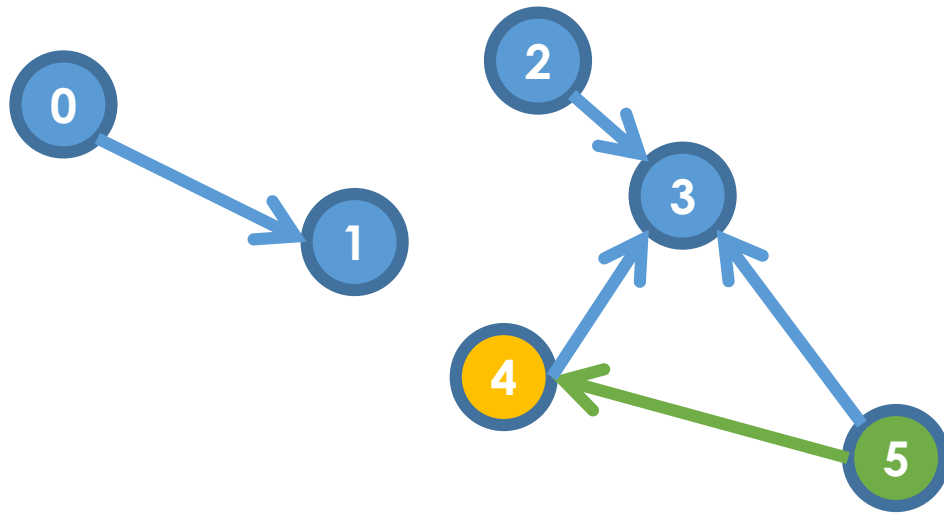
**$1 \rightarrow \text{null}$**

**$2 \rightarrow \{3\}$**

**$3 \rightarrow \text{null}$**

**$4 \rightarrow \{3\}$**

**$5 \rightarrow \{3,4\}$**



**In degree:  
number of incoming edges.**

**IVQ: Which implementation makes finding the in degree more efficient?**



# What's next?