

$V(G)$
 $E(G)$

directed **Graph**

Nodes
Vertices
vertices
 V

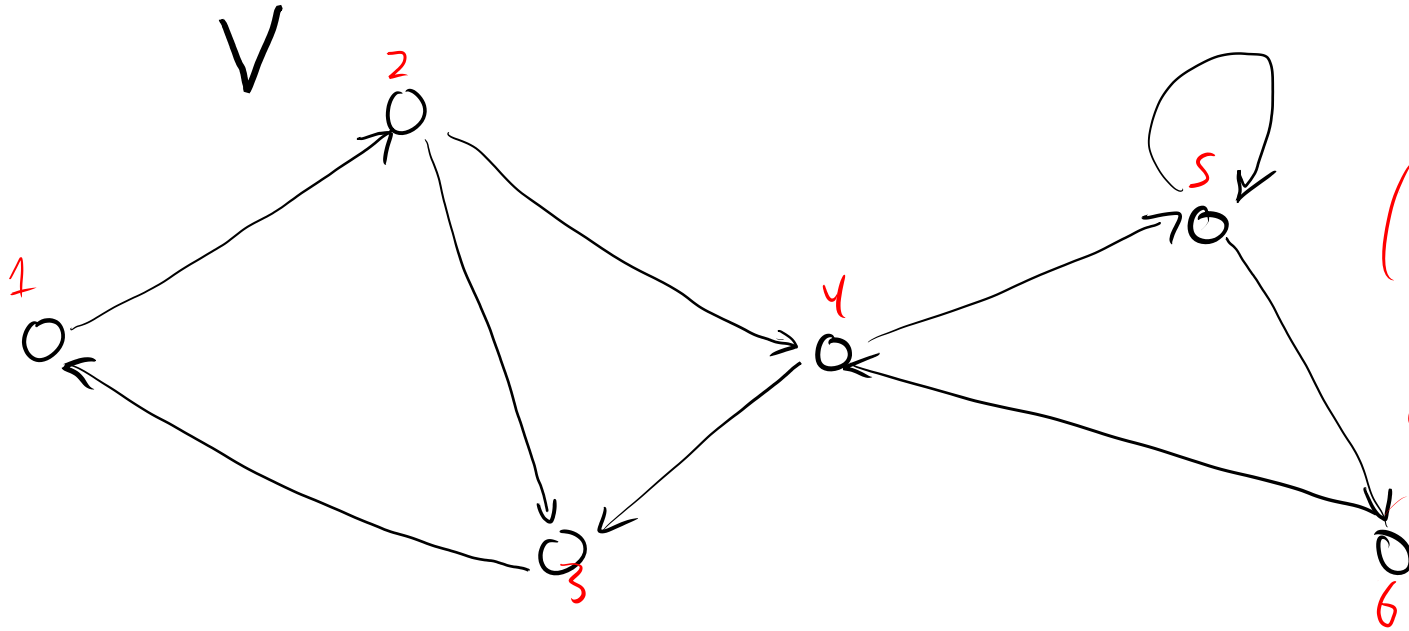
edges
 E

digraph

Set of edges
: tuple
sequence of 2 vertices
pair

$$G = (V, E)$$

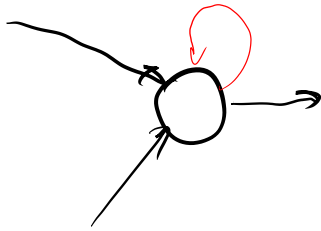
Set of vertices



$\{1, 2, 3, 4, 5, 6\}$,
 $\{(1, 2), (2, 3), (3, 1),$
 $(2, 4), (4, 3), (4, 5),$
 $(5, 6), (6, 4), (5, 5)\}$

degree of vertex = # of edges

indegree
outdegree



degree = 3 + 2
indegree = 2 + 1
outdegree = 1 +

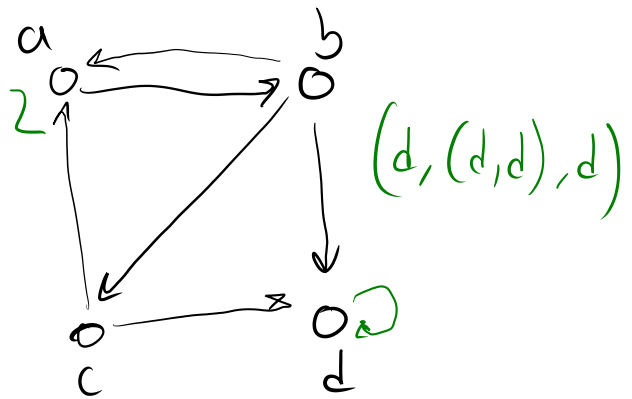
Walk • path • Cycle

↳ alternating sequence
vertex first + last + every other
edge

$$|(a, (a,b), b)| = 1$$

$$|(a, (a,b), b, (b,c), c)| = 2$$

$$|(a)| = 0$$



Path: walk w/ no repeated vertices

Cycle: walk, start + end at same vertex, no ^{other} repeats

length
 $|\text{walk}| \equiv \# \text{ of edges}$

directed

acyclic graph

DAG

no cycles

nodes = integers

edge = divides

