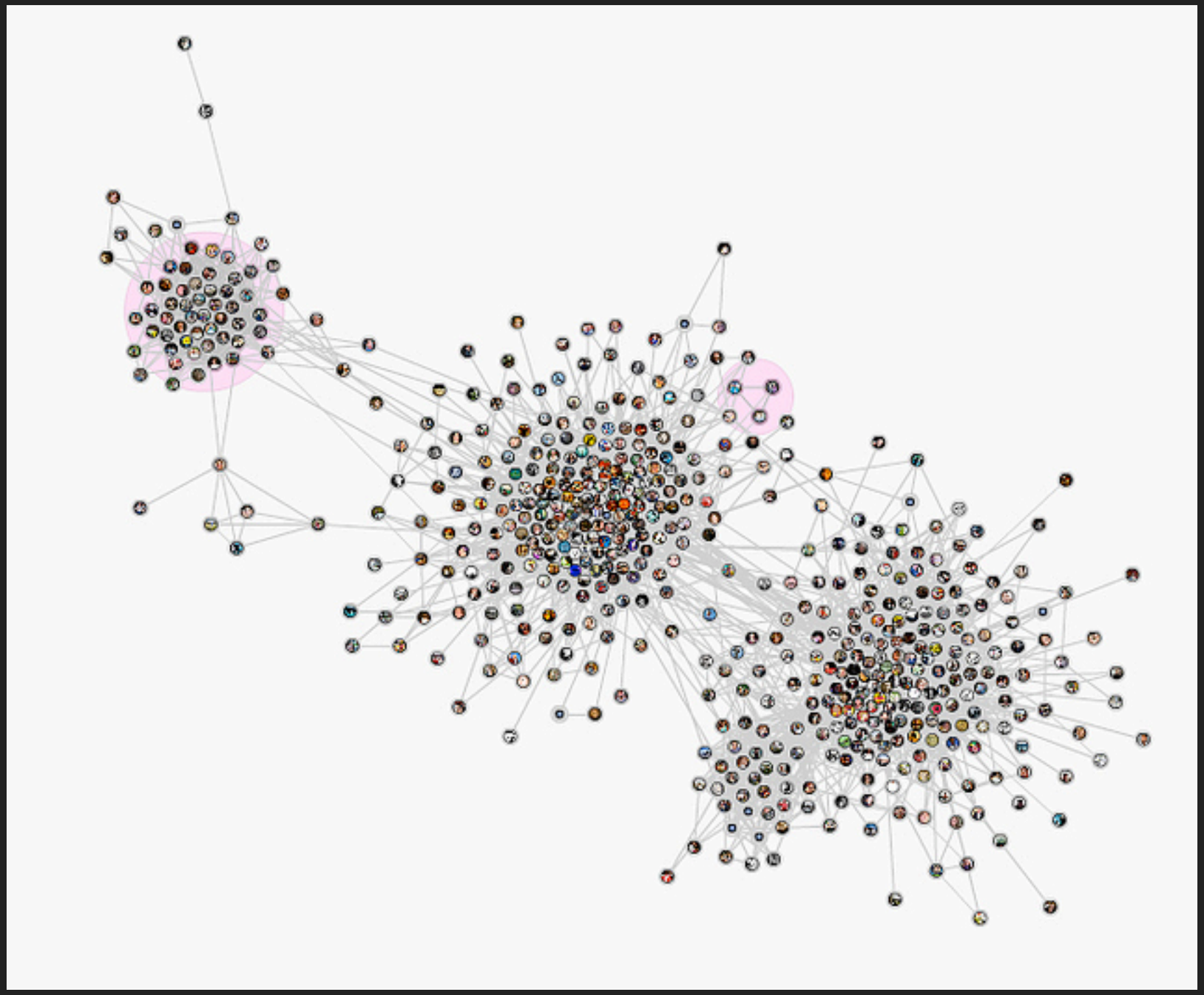
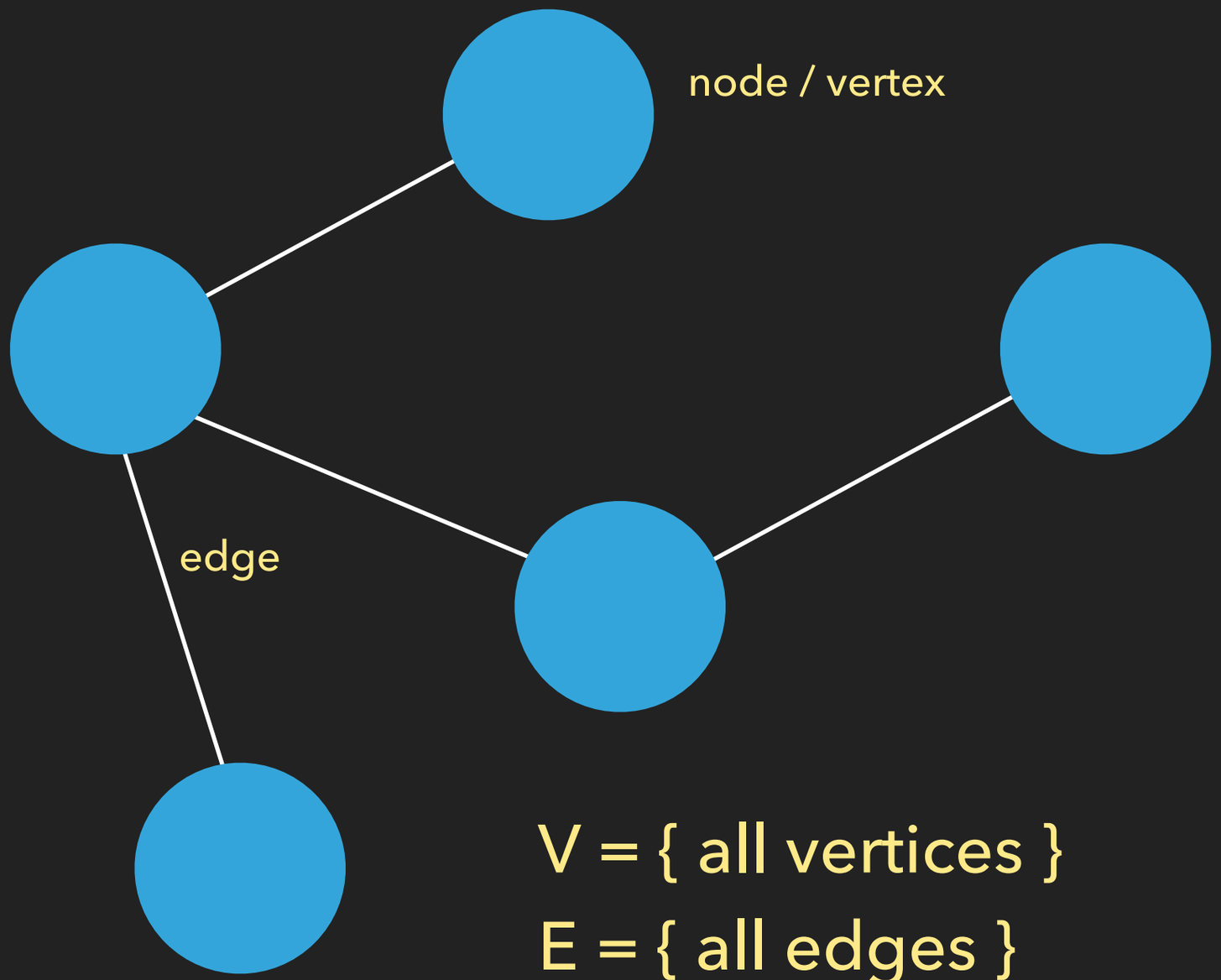
CSC 240

GRAPHS

GRAPHS



GRAPHS



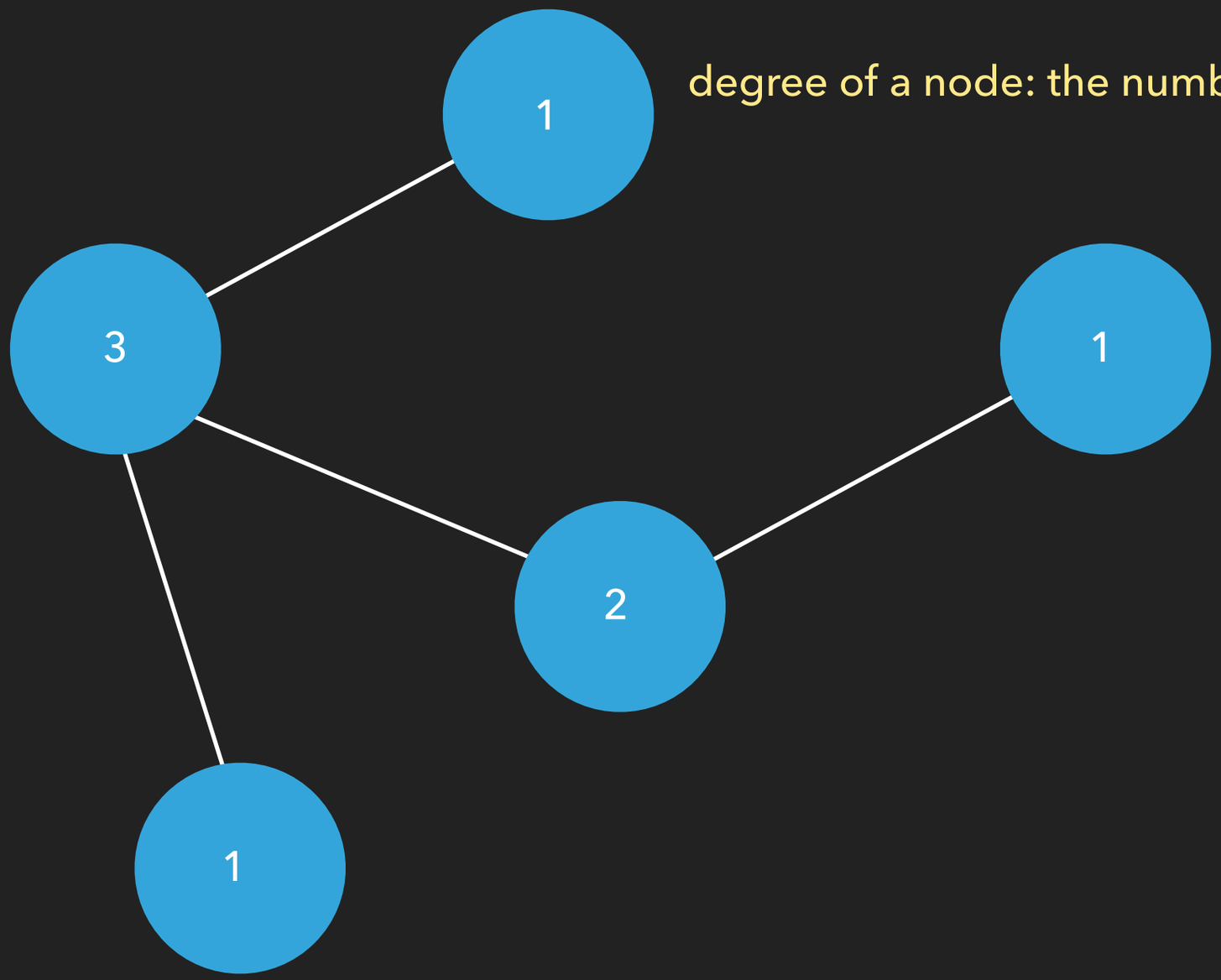
V = { all vertices }

E = { all edges }

G = (V, E)

GRAPHS

degree of a node: the number of edges connected to that node.



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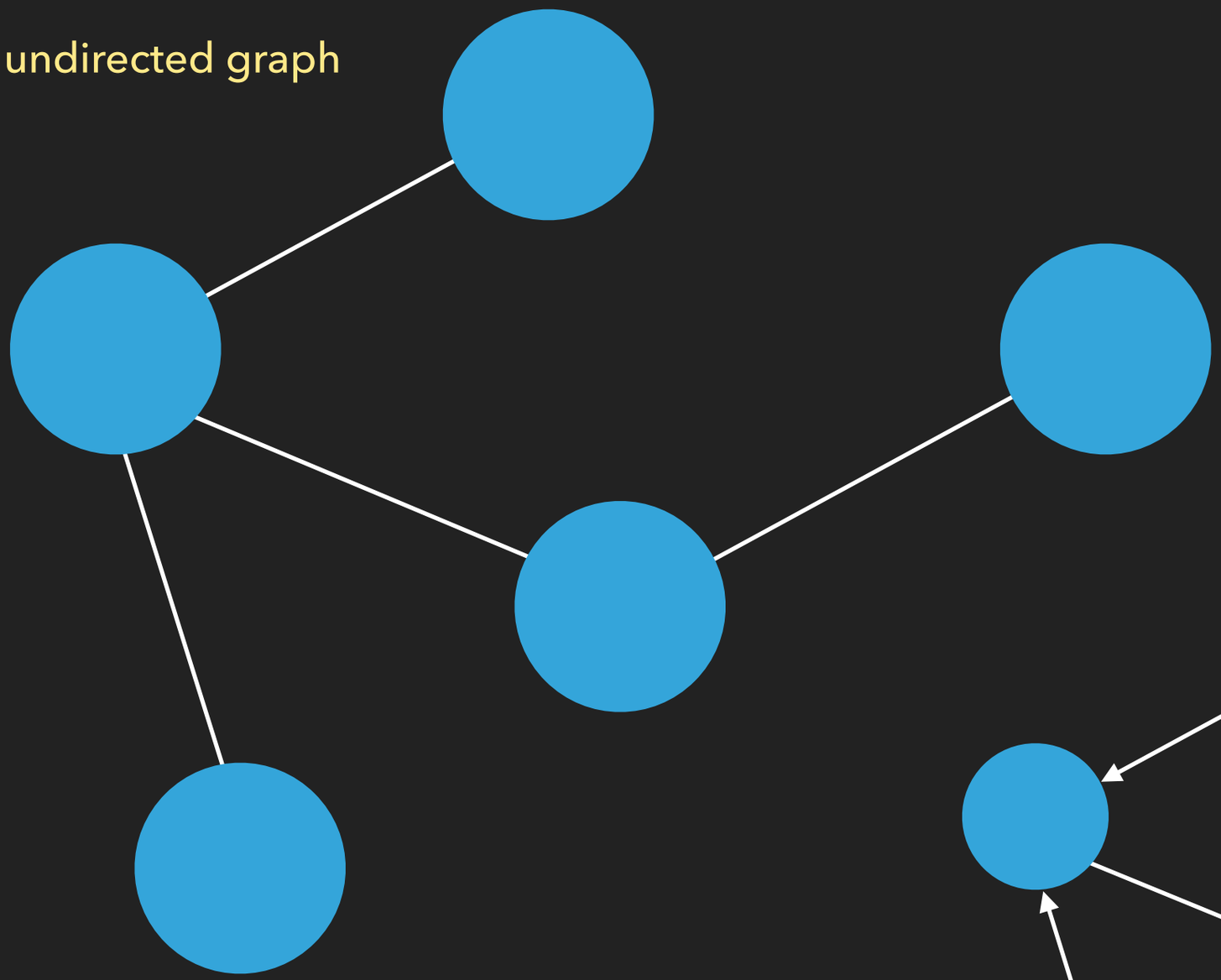
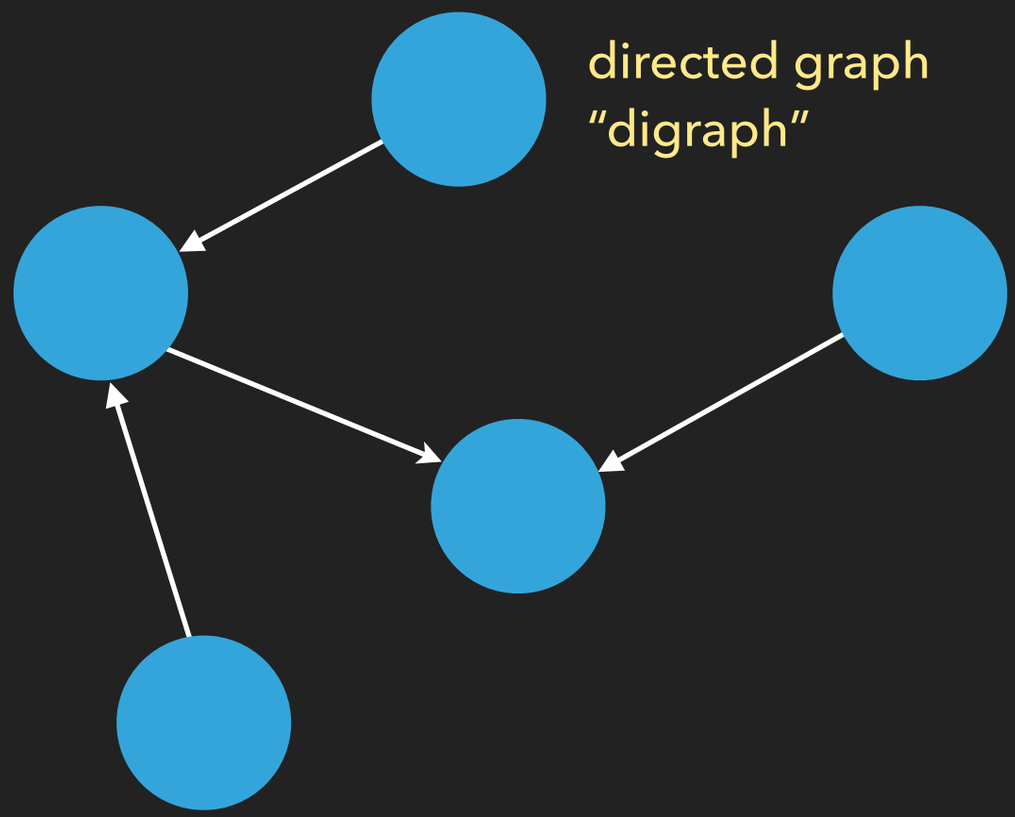
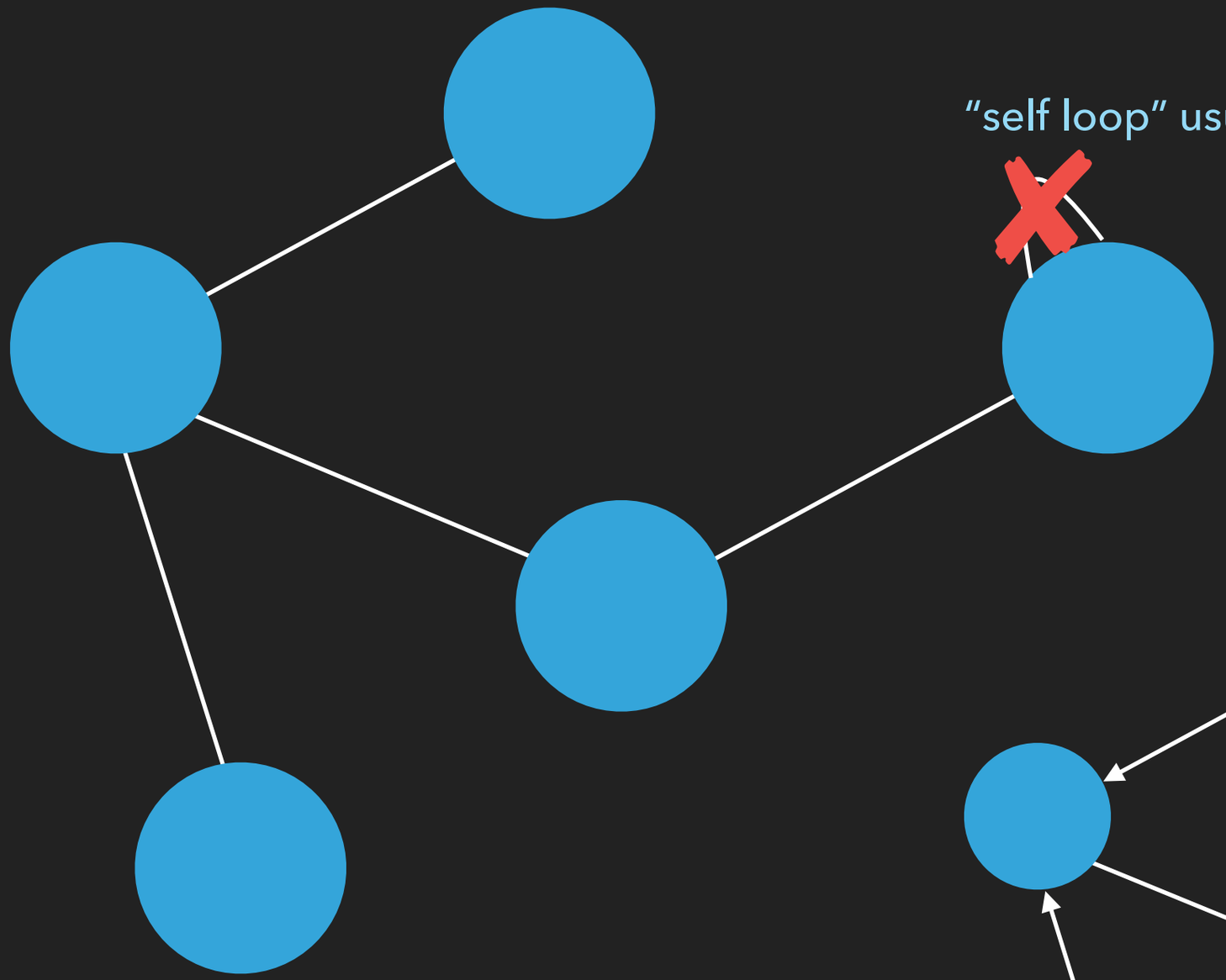
undirected graph



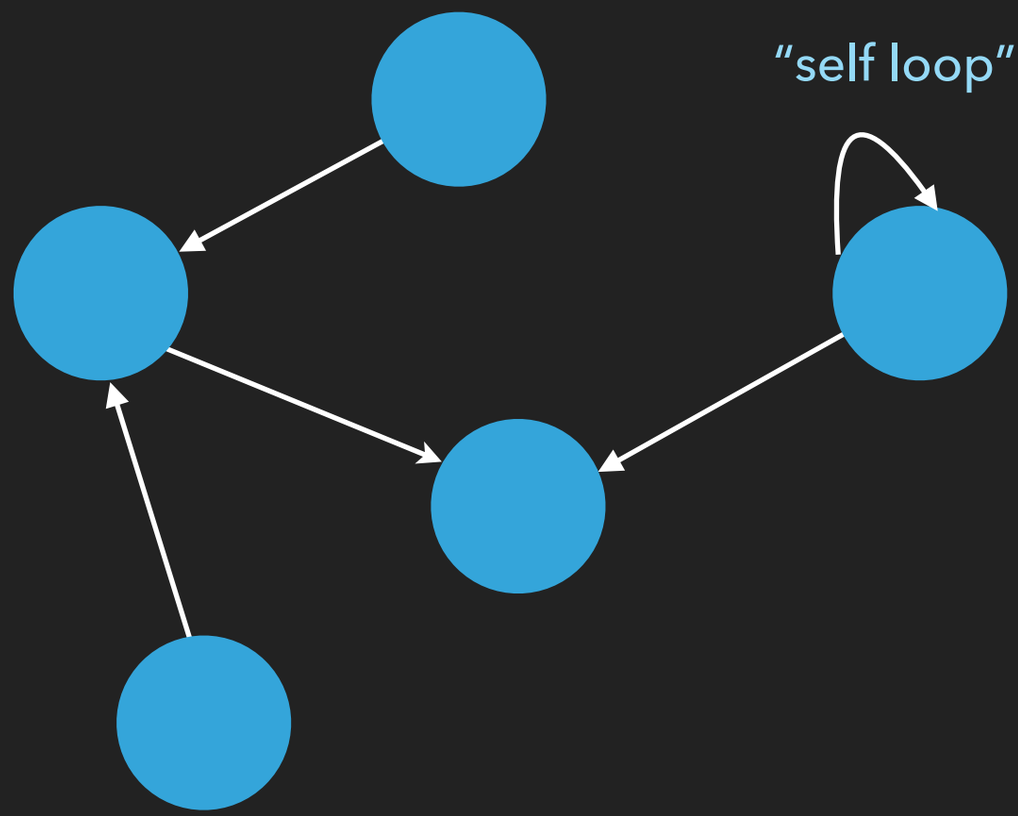
directed graph
“digraph”



GRAPHS



“self loop” usually not allowed in undirected graphs



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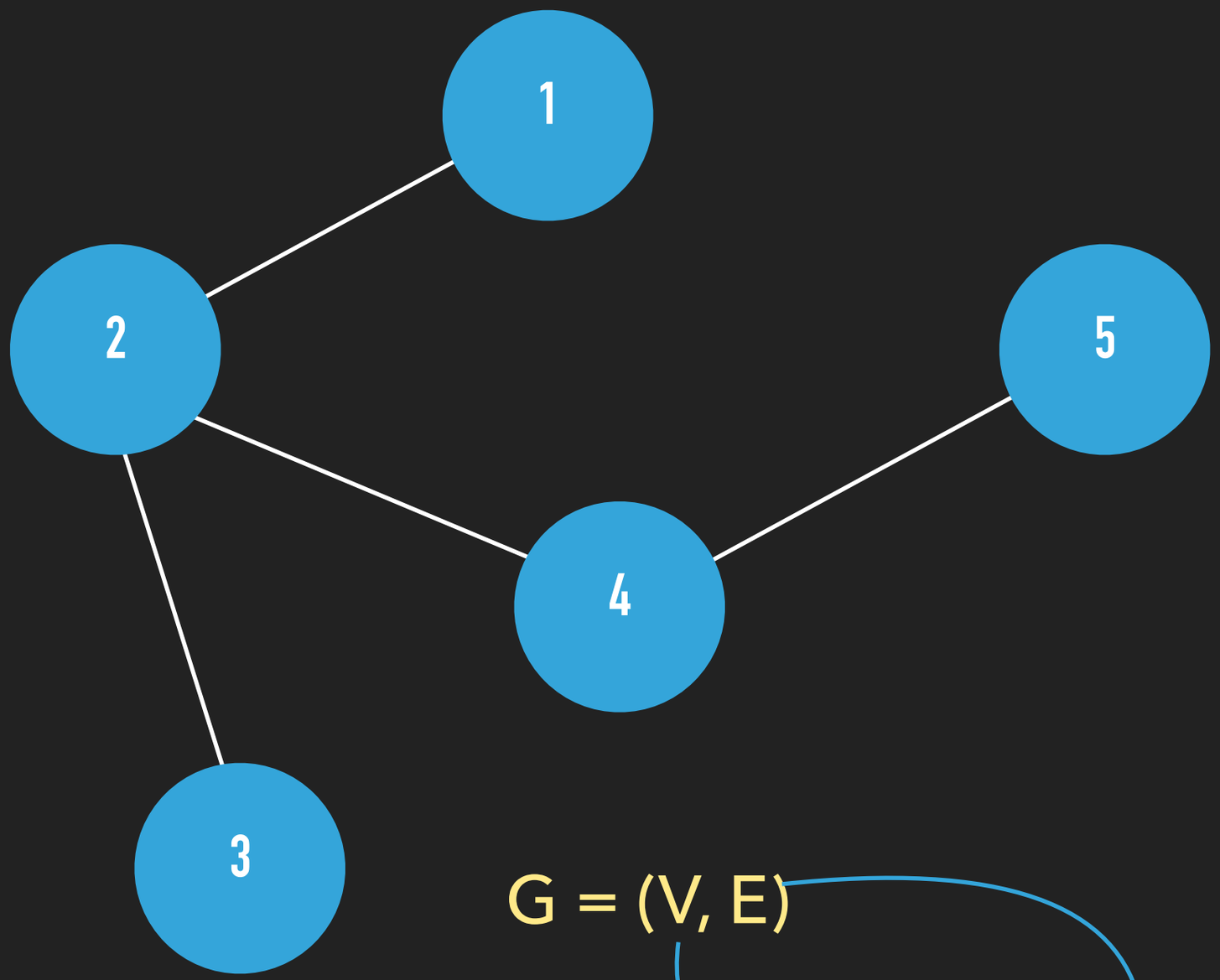
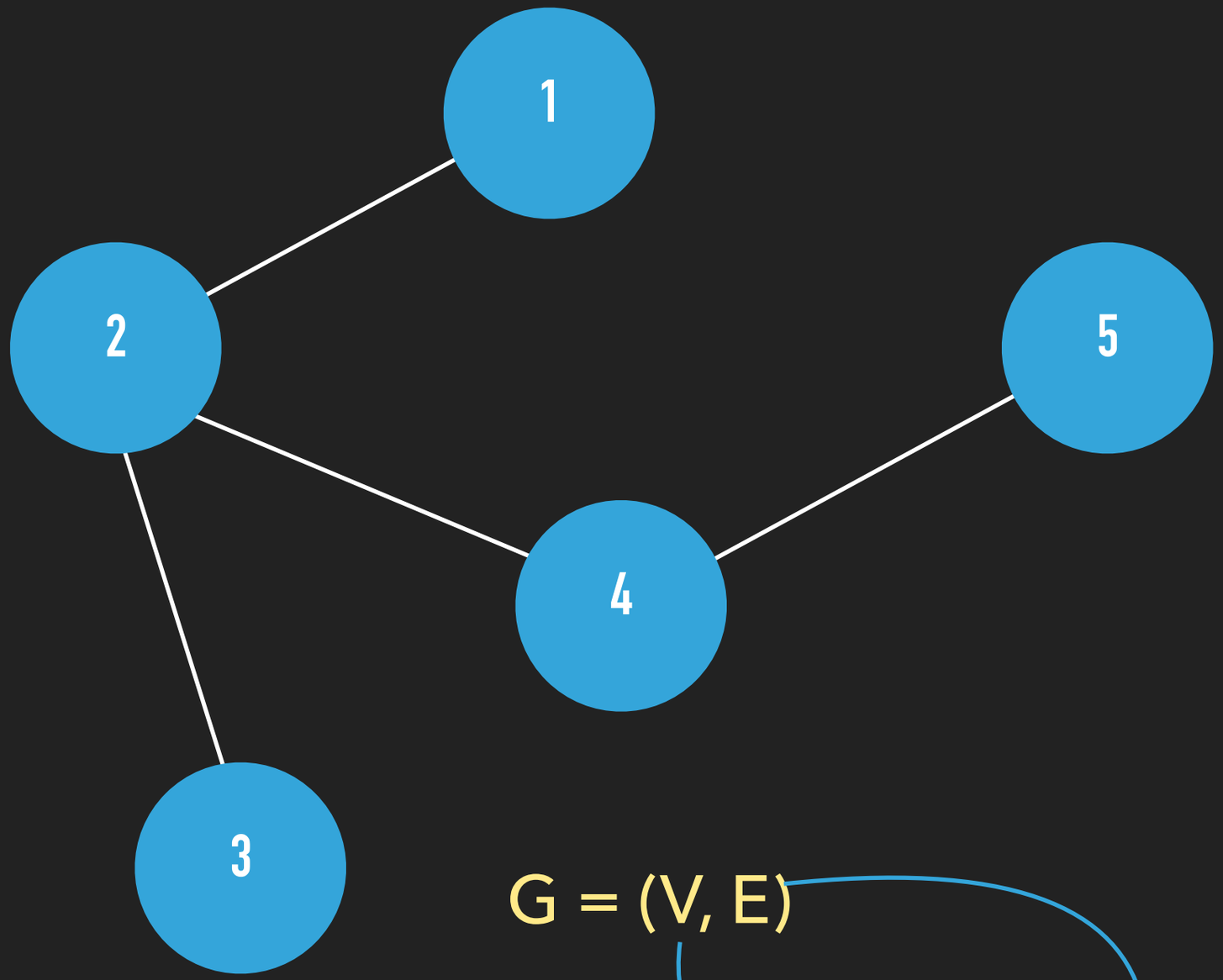


G = (V, E)

G = ({1, 2, 3, 4, 5} , { {1,2}, {2,3}, {2,4}, {4, 5} })

GRAPHS

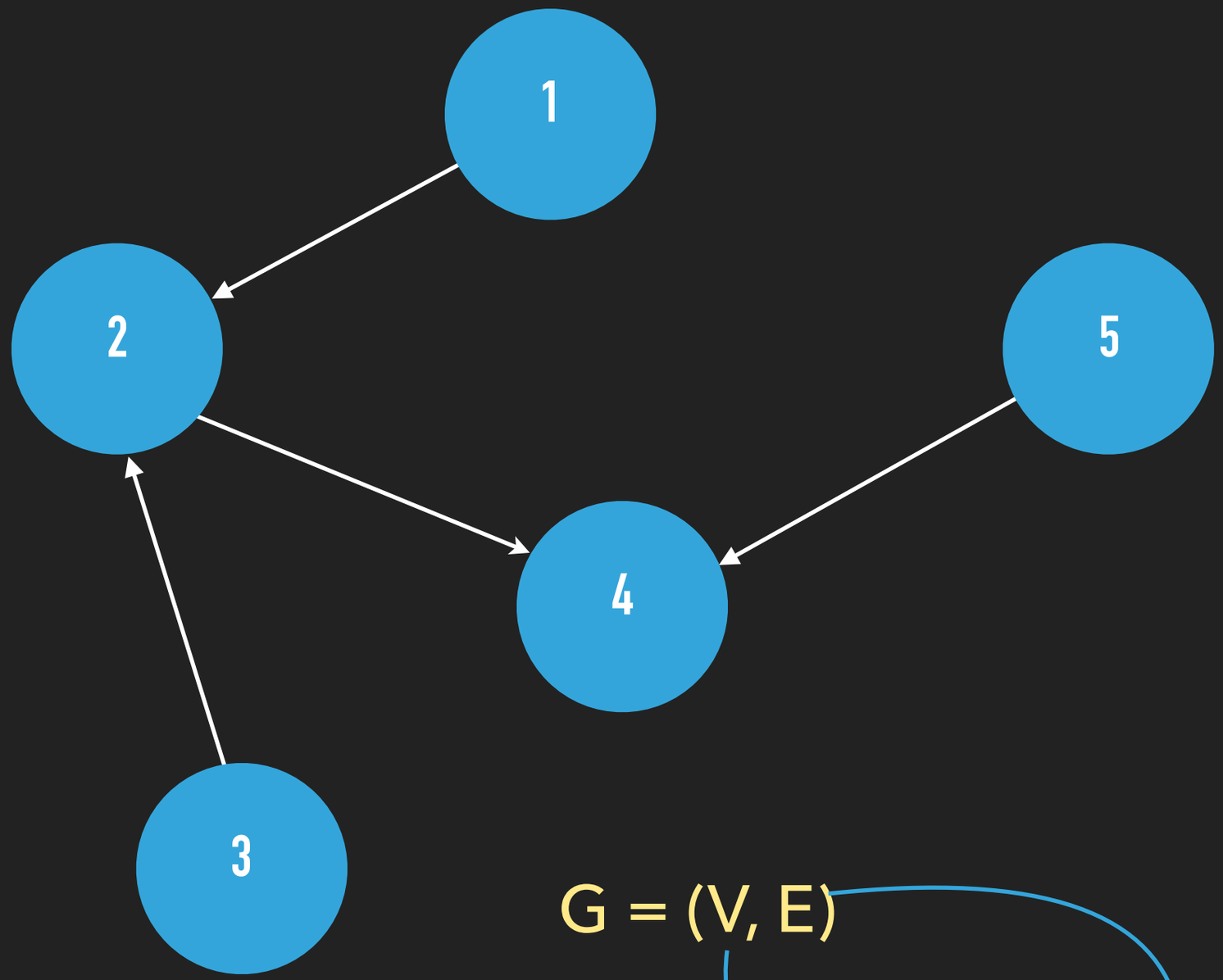


G = (V, E)

G = ({1, 2, 3, 4, 5} , { {1,2}, {2,3}, {2,4}, {4, 5} })

Notice that these are “unordered pairs”

GRAPHS



G = (V, E)

G = ({1, 2, 3, 4, 5} , { (1,2), (3,2), (2,4), (5, 4) })

Notice that these are “ordered pairs”, following the order of the edge.

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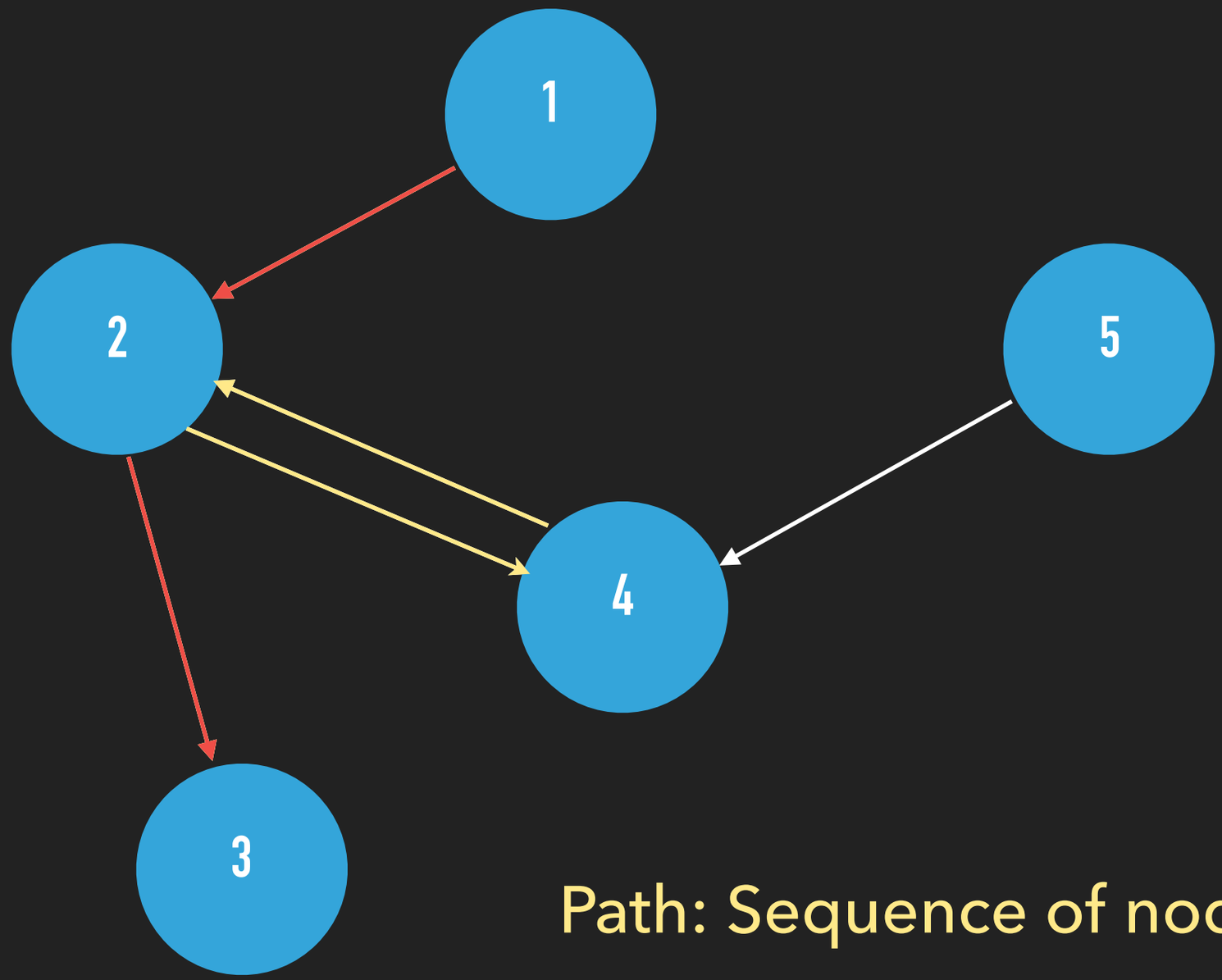

Path: Sequence of nodes connected by edges.
(1, 2, 4, 2, 3)

Simple Path: A path with no repeated nodes.
(1, 2, 3)

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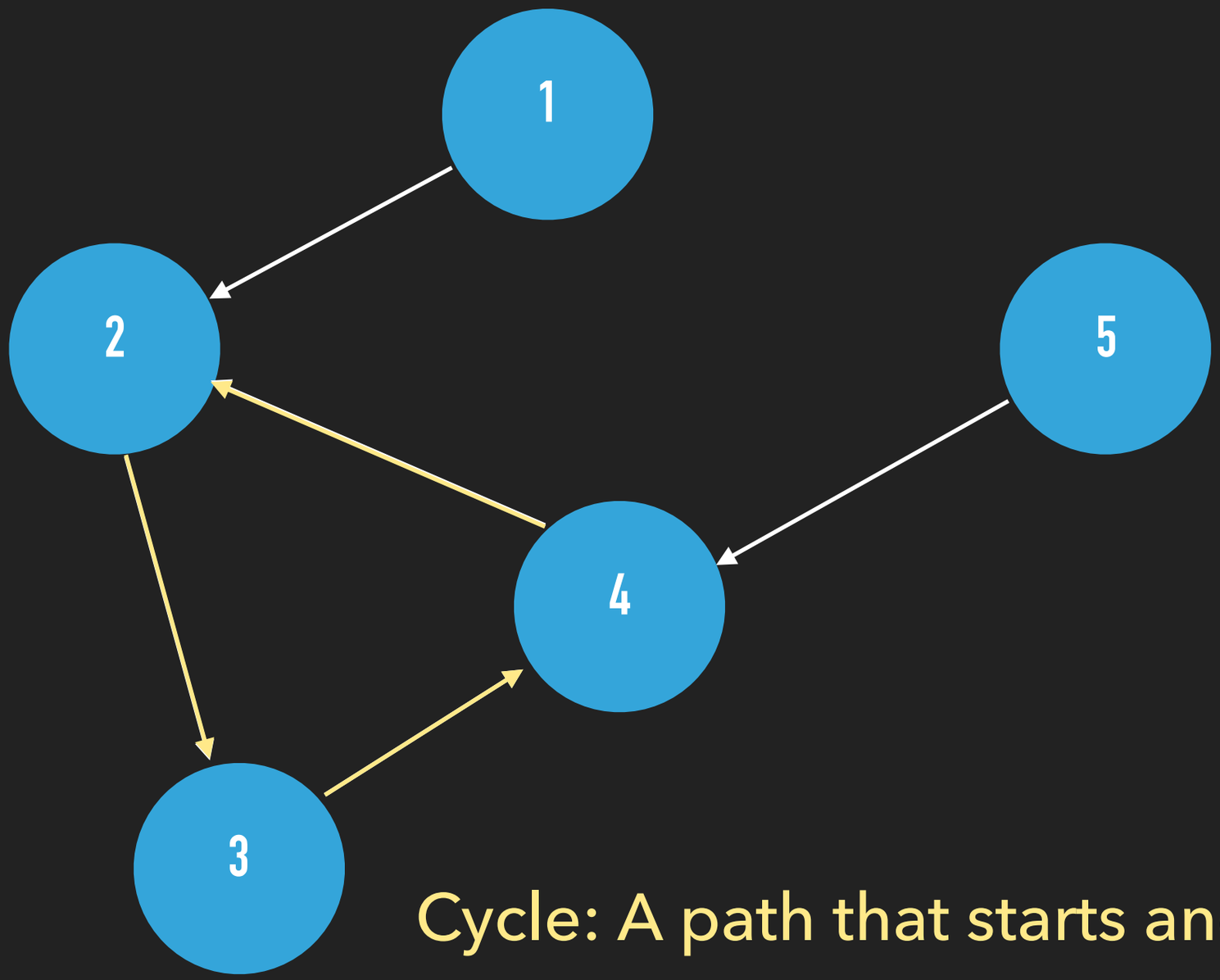

Cycle: A path that starts and ends at the same node.
(2, 3, 4, 2)

Simple Cycle: A cycle with no repeated nodes except the first and the last.

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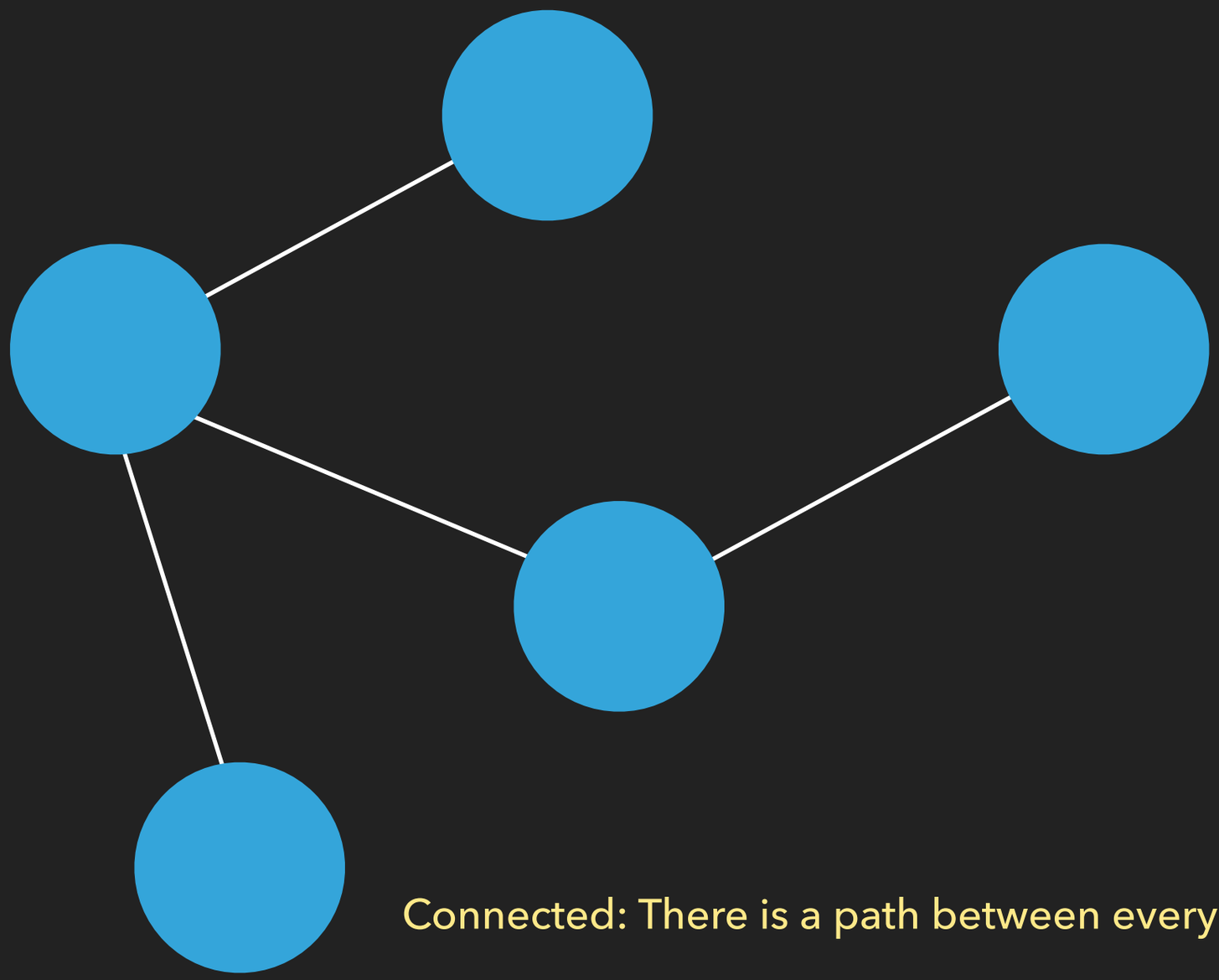

Connected: There is a path between every pair of nodes.

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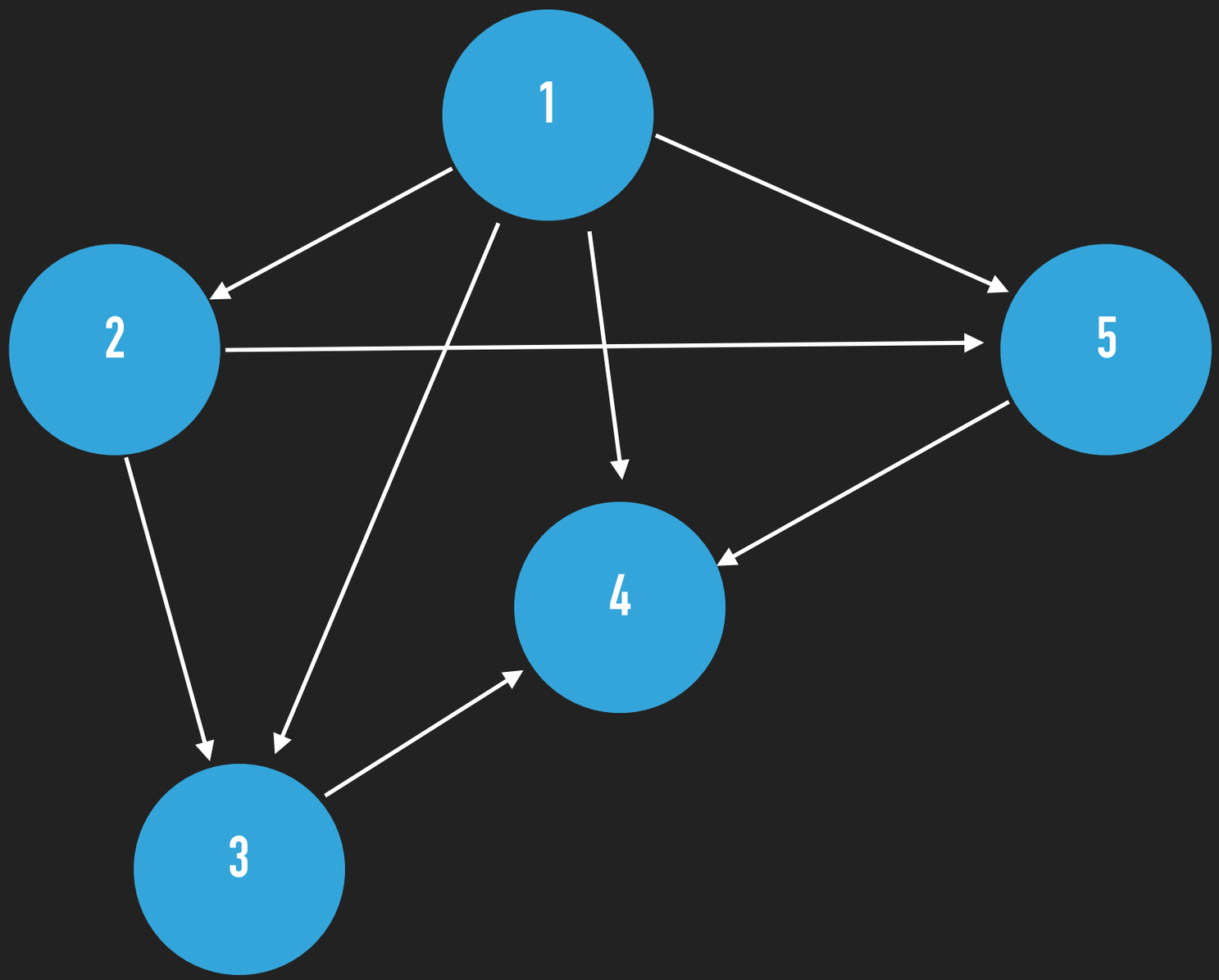

Strongly Connected: There is a directed path between every pair of nodes.

What needs to change about this graph to make it strongly connected?

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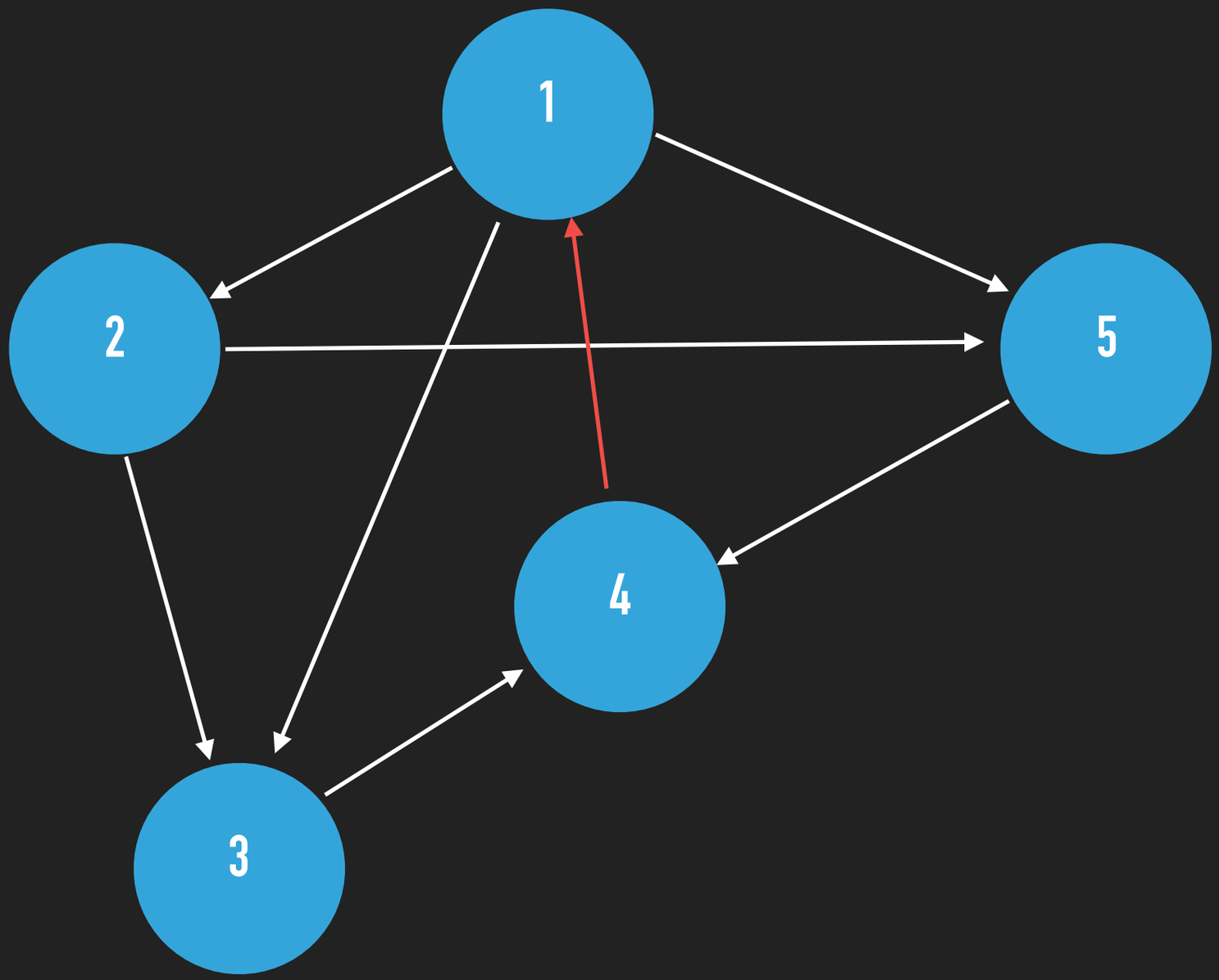

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What needs to change about this graph to make it strongly connected?