



# Neighbour graph

Draw the graph whose

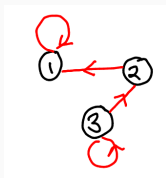
- vertices are the states or territories of Australia,
- two vertices are joined by an edge if they share a border.



Write the adjacency matrix.

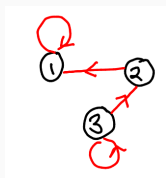
## Another adjacency matrix

Write the adjacency matrix of the following directed graph.



# Degree of a vertex

- The *out-degree* of a vertex is the number of edges going out of it.
  - The *in-degree* of a vertex is the number of edges coming into it.
1. Find the incoming and outgoing degrees in the previous graph.



2. How are you read off the degrees from the adjacency matrix?

# In = out?

True or false:

Sum of all in-degrees = Sum of out-degrees.

# Trees

An undirected graph is a *tree* if it is connected and has no cycles. Draw 3 examples of trees and 3 examples on non-trees.

# Leaves

A *leaf* of a tree is a vertex of degree 1.

True or false: every tree has at least one leaf.

# Edges of a tree

Count the number of vertices and edges in your trees.

- Can you see a pattern?
- Can you explain the pattern?