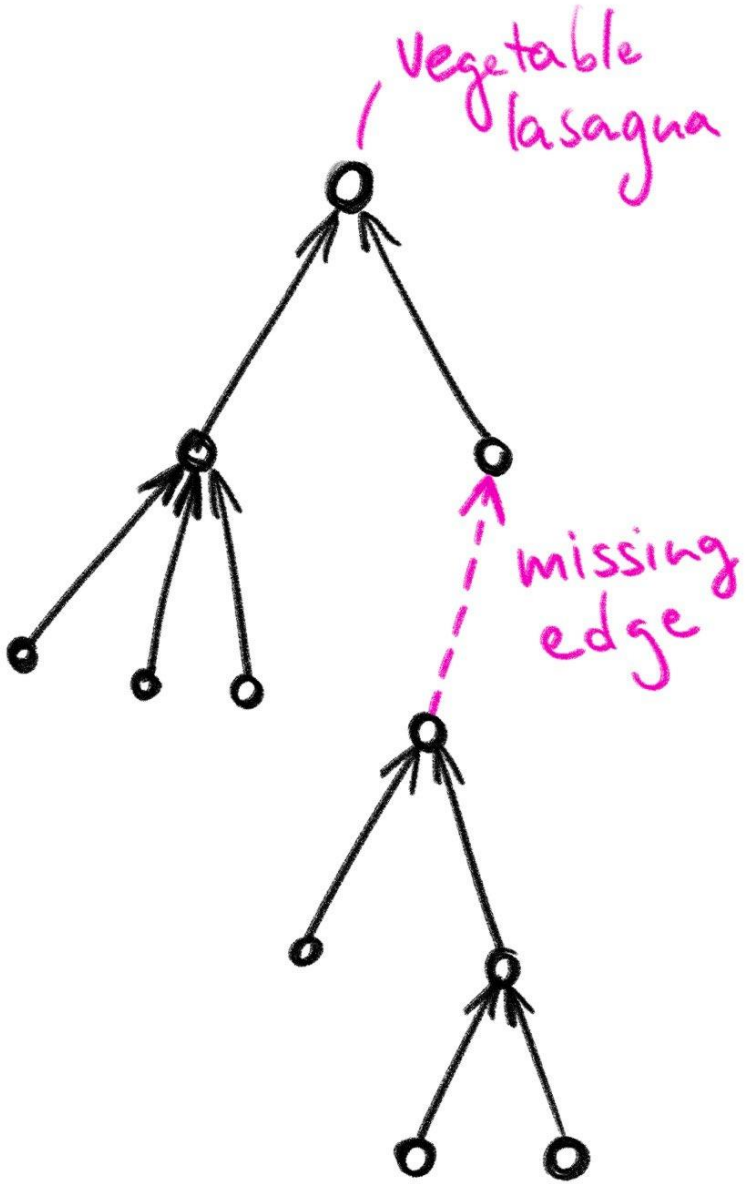
# Dine Travel

**Problem**

- given a directed tree with **one edge missing** and
- a **topological sorting** size $n$ of the full tree (without the missing edge)
- find the **number of possibilities** where the missing edge could be inserted and
- one **example** of a possible missing edge
- check if given **already contradicts** the topo sort



**Solution**

- find **two components** of the graph and their respective **roots**
- one root must be the lasagna
- the other one (position $p$ in the topo sort) can be connected to **any node** that comes **after it**
- number of possibilities = $n - p$
- if $\exists\ edge(u, v)$ with $\boldsymbol{time(u) > time(v)}$, there's a contradiction

- complexity: $\mathcal{O}(n)$