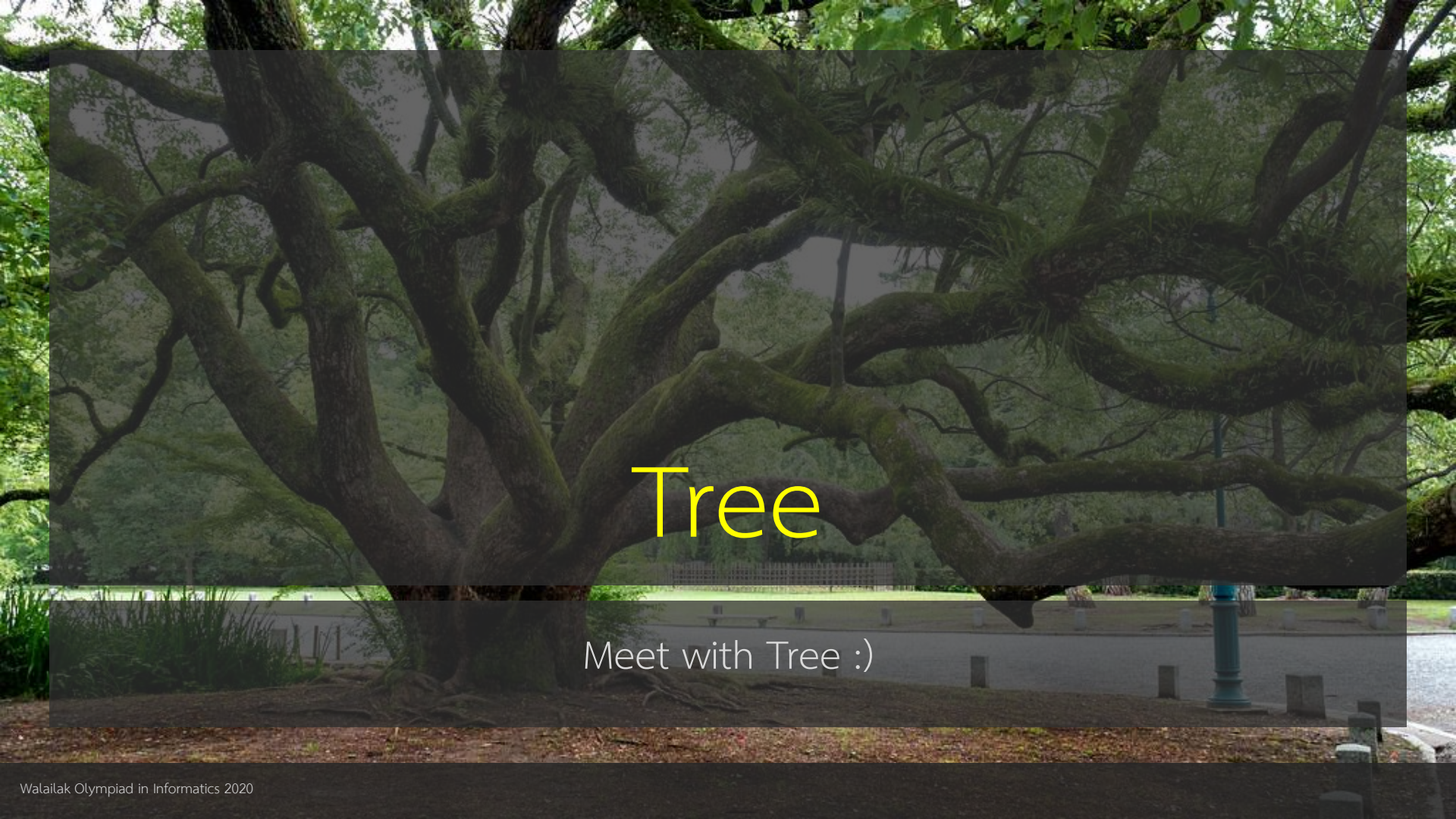


Tree

Meet with Tree :)

Outline

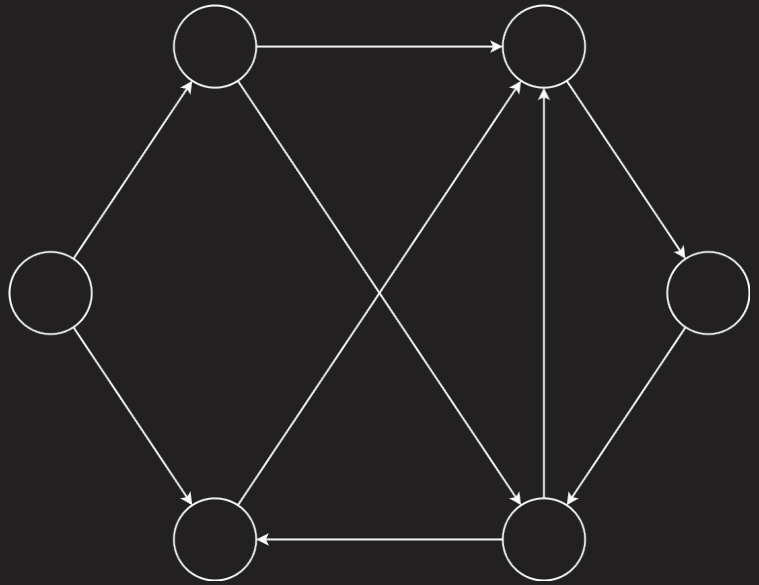
1. What is a Tree data structure?
2. Terminology
3. Applications
4. Binary Tree

Open in Google slides click here

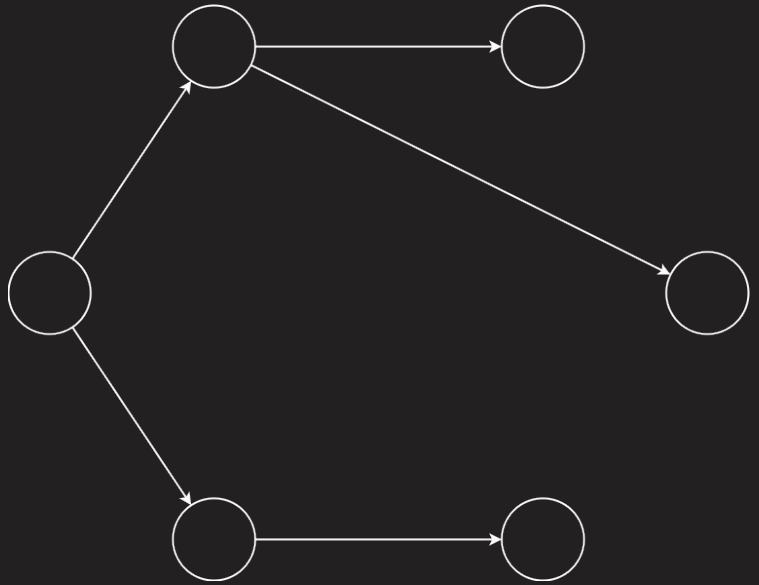
What is a Tree data structure?

What is a Tree data structure?

- Tree is a kind of graph but **doesn't contain** loop/cycle/triangle.



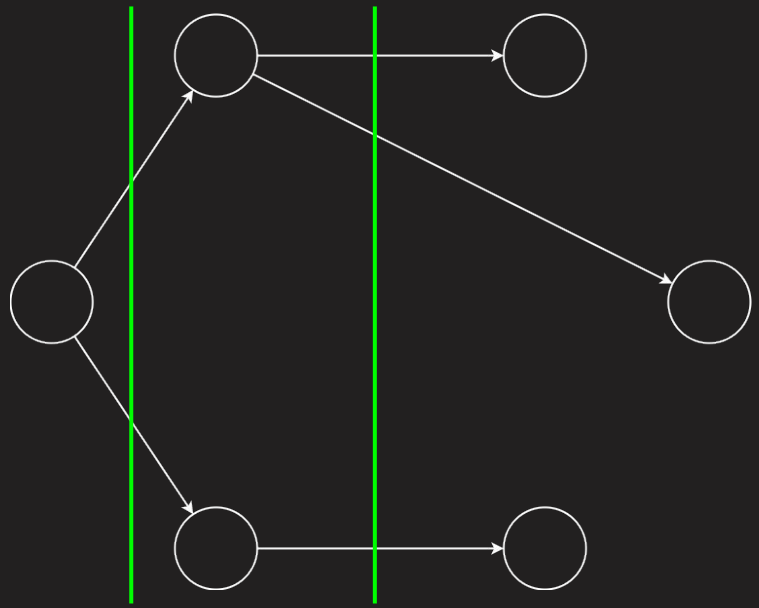
Graph but isn't Tree

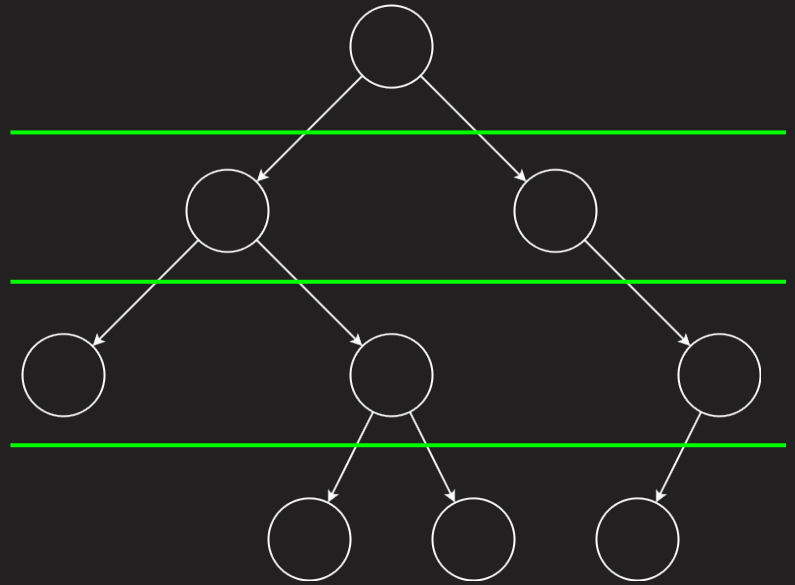


Graph and Tree

What is a Tree data structure?

- Hierarchical data structure

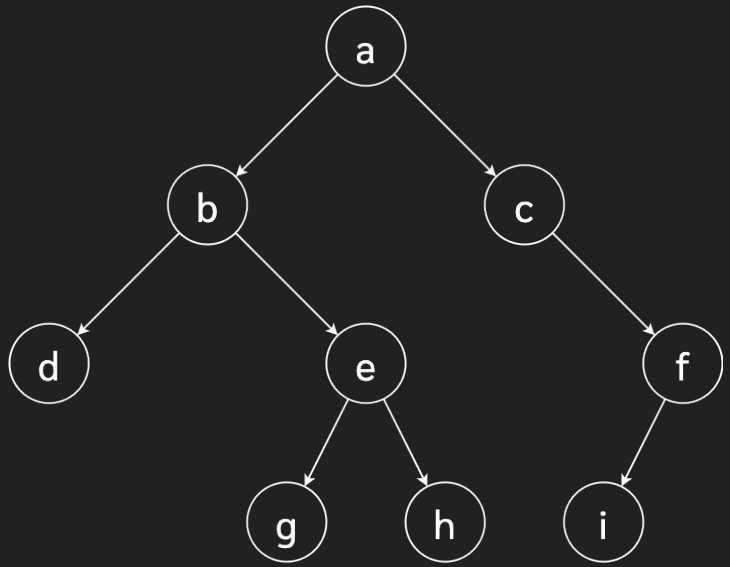




Terminology

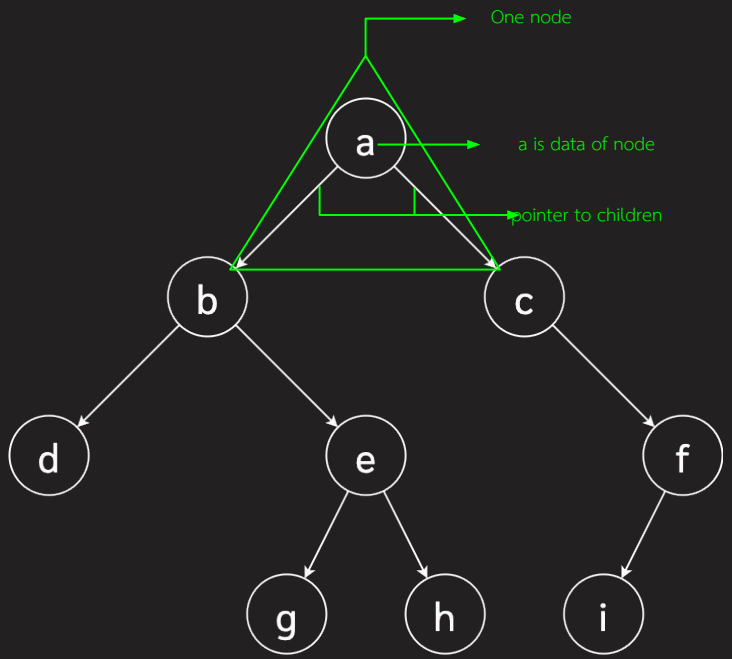
Terminology

- Node
- Root
- Parent
- Child
- Leaf
- Level



Terminology

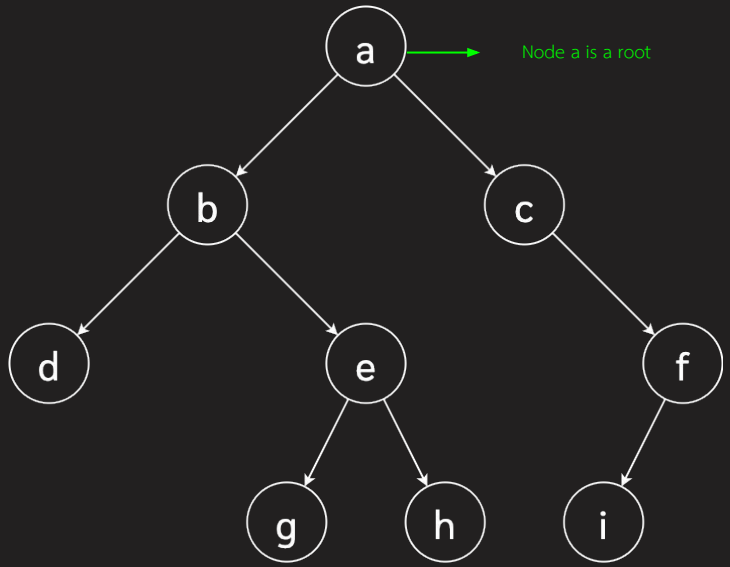
- **Node**
  - Each node contains
    - Data
    - Pointer to child(ren)
- Root
- Parent
- Child
- Leaf
- Level



Terminology

- Node
- **Root**
- Parent
- Child
- Leaf
- Level

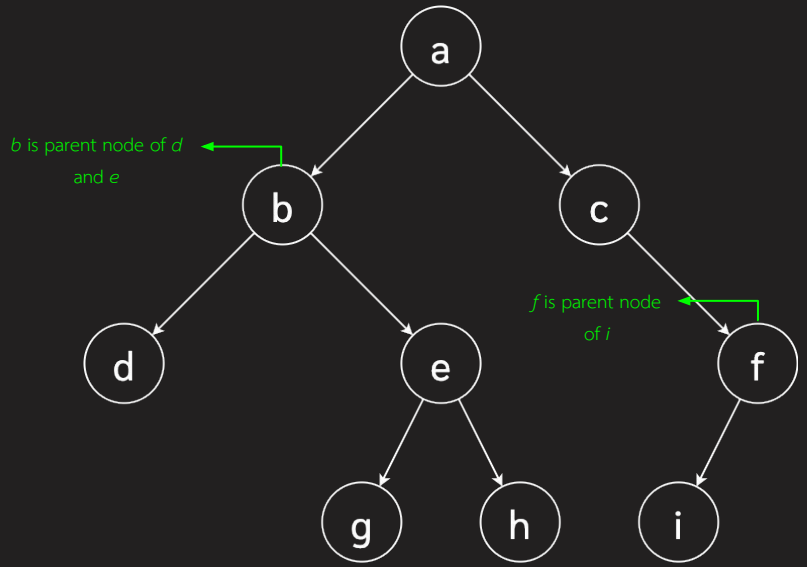
- The Topmost node
- Each tree has **only one** root



Terminology

- Node
- Root
- **Parent**
- Child
- Leaf
- Level

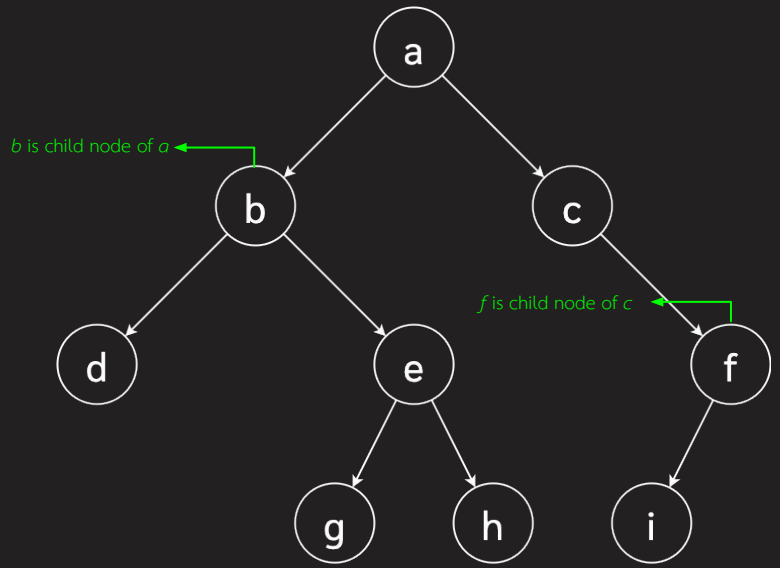
- Have **at least** one node under



Terminology

- Node
- Root
- Parent
- **Child**
- Leaf
- Level

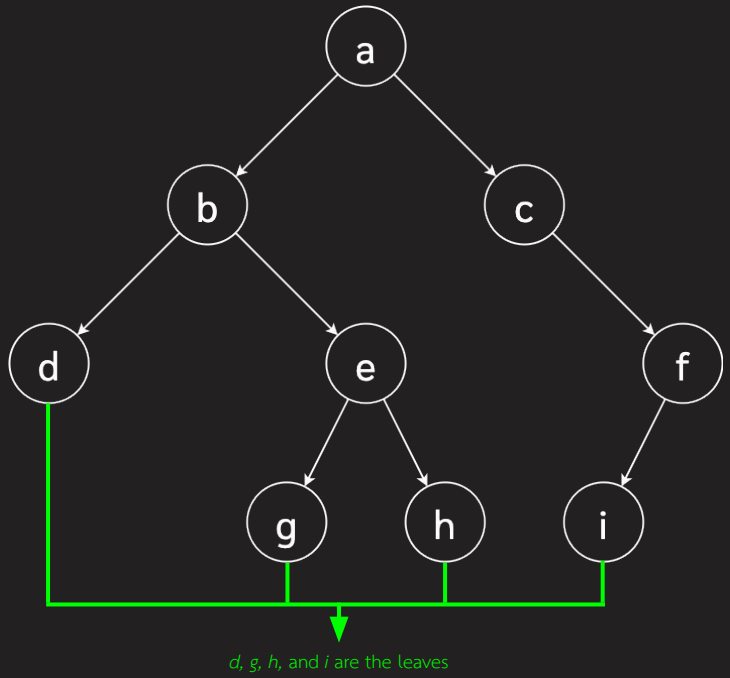
- **Descendant** of a node
- All nodes except root are child nodes



Terminology

- Node
- Root
- Parent
- Child
- **Leaf**
- Level

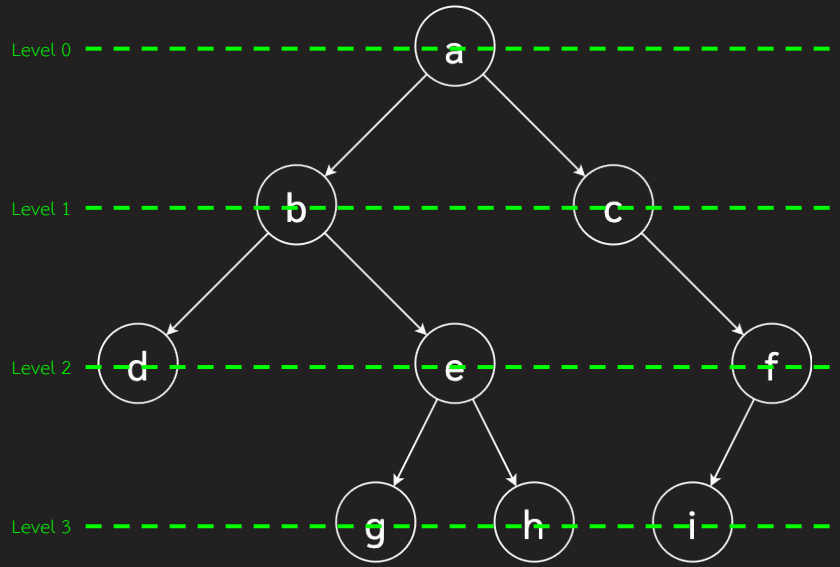
- The node that **Has no child**



Terminology

- Node
- Root
- Parent
- Child
- Leaf
- **Level**

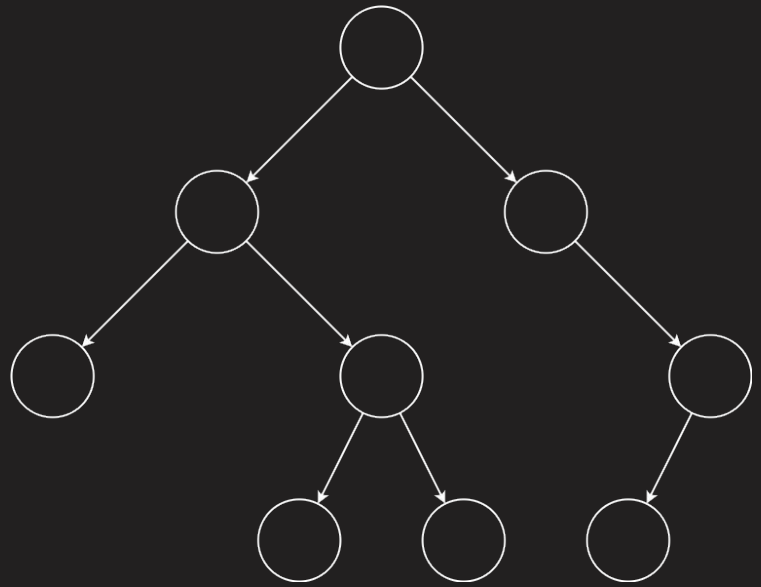
- Each step **from the root** is called level of a tree



Applications and Benefits

Application

- Manage hierarchical data
  - File system
  - Organization data
- Binary Search Tree
- Heap/ priority queue



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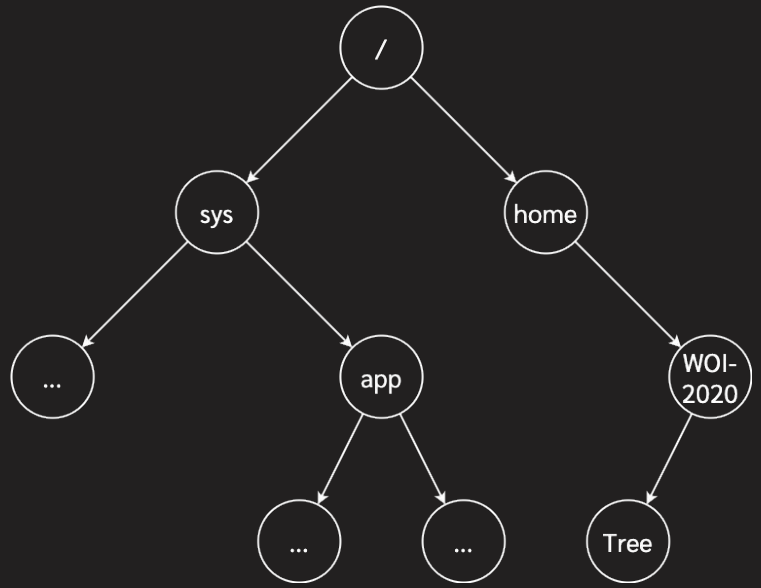
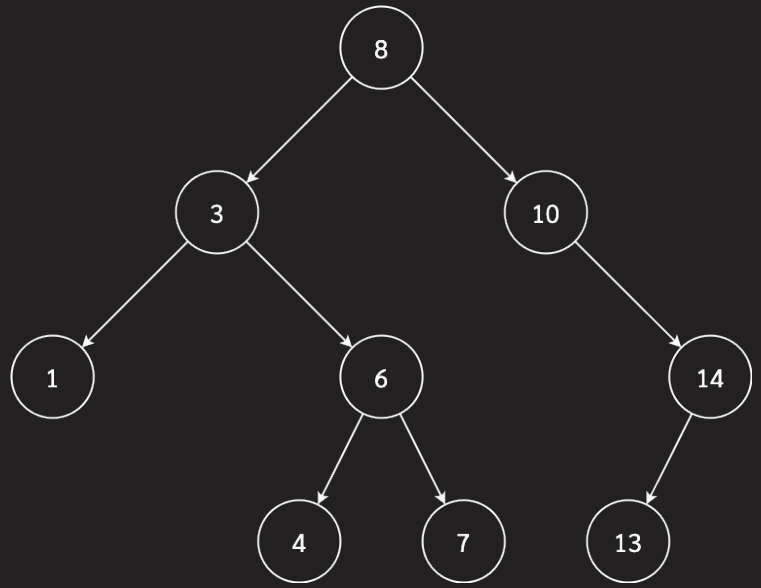


Application

- Manage hierarchical data
  - File system
  - Organization data
- **Binary Search Tree**
- Heap/ priority queue



Application

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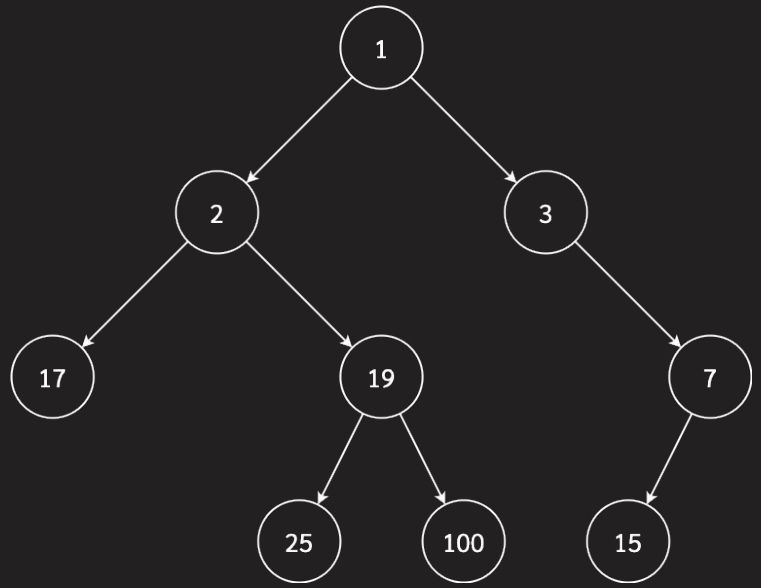

Benefit from Tree

- Manipulate hierarchical data
- Make information easy to search
- Manipulate sorted list of data
- Router algorithm
- Form of a multi-stage decision making