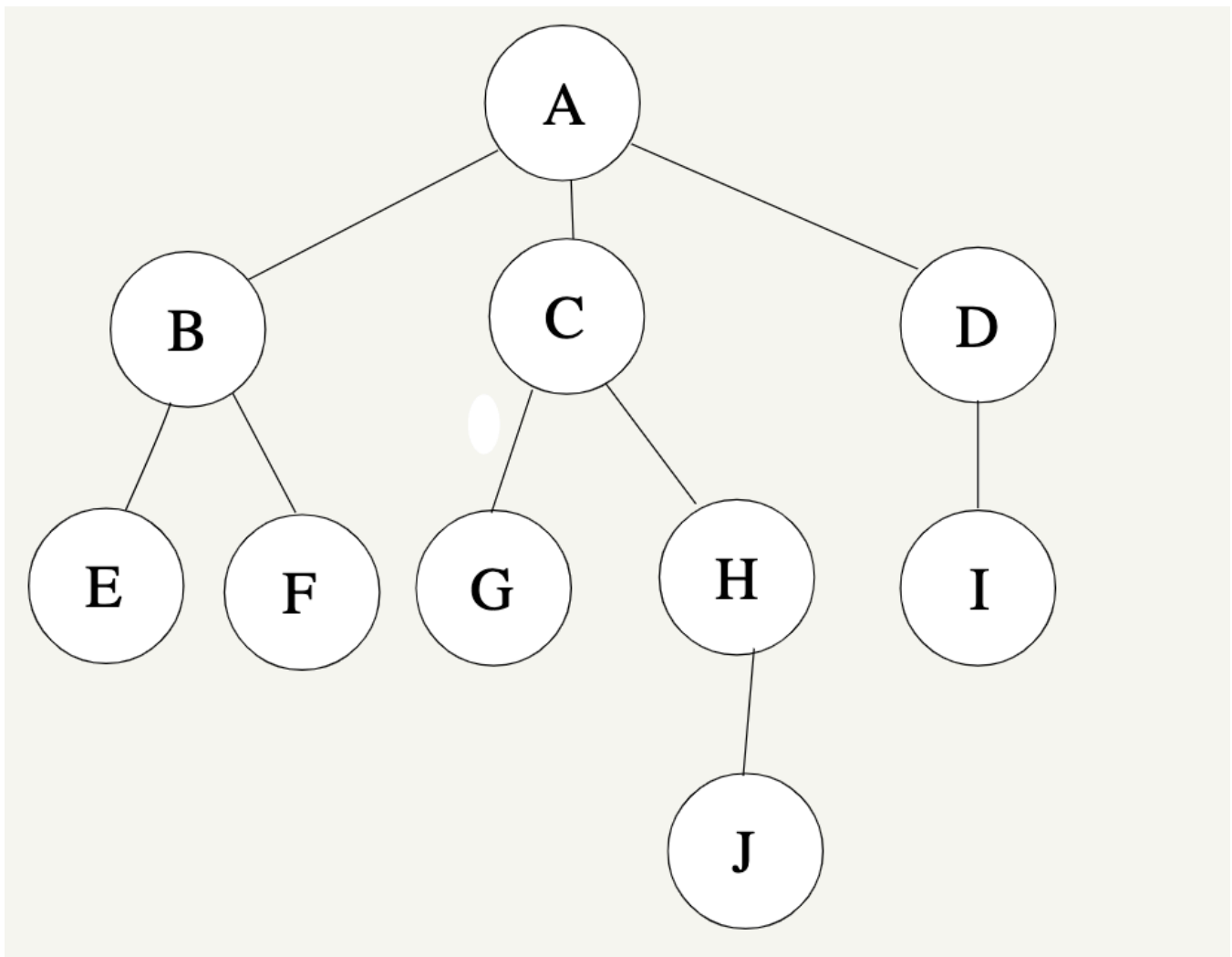


## 6.1 Introduction to Trees

### TREE DATA STRUCTURE:

- Hierarchical structure
- Recursive data structure (**Trees are either**)
  - Empty /
  - Has a **root value** connected to any number of other trees (**subtrees** of the tree)



### WHEN THE TREE ISN'T EMPTY:

- Has a **root with 0+ subtrees**

**INTERNAL VALUES:**

- The **children that aren't leafs**, the ones that have at least one subtree

**SIZE:**

- # of values in the tree

**LEAF:**

- A value with no subtrees

**HEIGHT:**

- The length of the *longest path from root to one of its leaves*

**CHILDREN OF A VALUE:**

- All values **directly** connected to that value
- Equal to the number of its "subtrees"

**DESCENDANTS:**

- Its children, the children of its children... etc.

**PARENT:**

- The value **immediately above** & connected to it
- Every value has a parent except the root!

**ANCESTORS:**

- Its parent, the parent of its parent ... etc.

**ARITY/ BRANCHING FACTOR:**

- The max number of children for any node