

# Degree of Concurrency

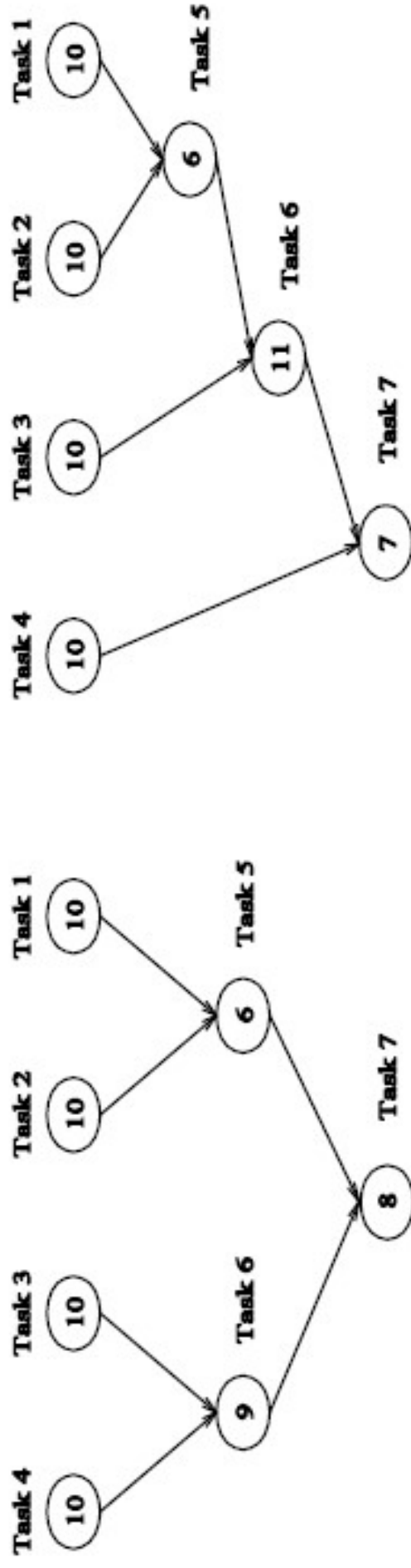
- **Degree of Concurrency:** # of tasks that can execute in parallel
  - **maximum degree of concurrency:** largest # of concurrent tasks at any point of the execution
  - **average degree of concurrency:** average # of tasks that can be executed concurrently
- Degree of Concurrency vs. Task Granularity
  - Inverse relation

## Critical Path of Task Graph

- **Critical path:** The longest directed path between any pair of *start node* (node with no incoming edge) and *finish node* (node with on outgoing edges).
- **Critical path length:** The sum of weights of nodes along critical path.
  - The weights of a node is the size or the amount of work associated with the corresponding task
- **Average degree of concurrency** = total amount of work / critical path length

# Example: Critical Path Length

Task-dependency graphs of query processing operation



**Left graph:**

Critical path length = 27

Average degree of concurrency =  $63/27 = 2.33$

**Right graph:**

Critical path length = 34

Average degree of concurrency =  $64/34 = 1.88$