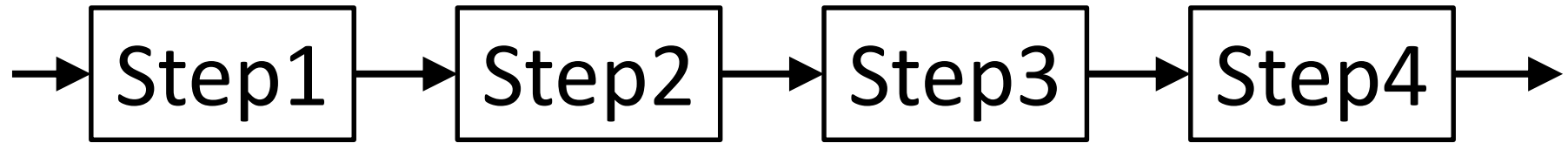


Pipeline

- CPU Instruction pipeline
- Graphics pipeline
- Various algorithms



A step can be executed by a:

- thread
- process
- hardware element

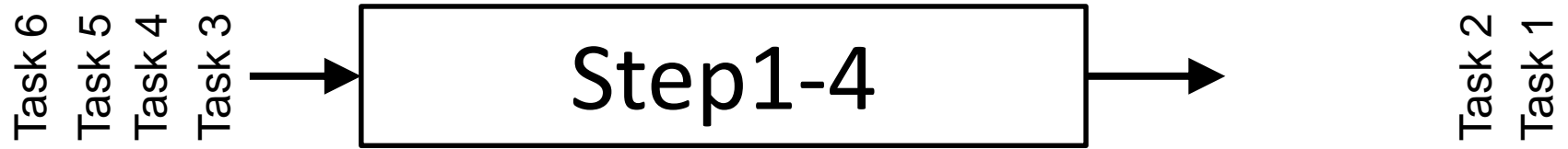
Without Pipeline



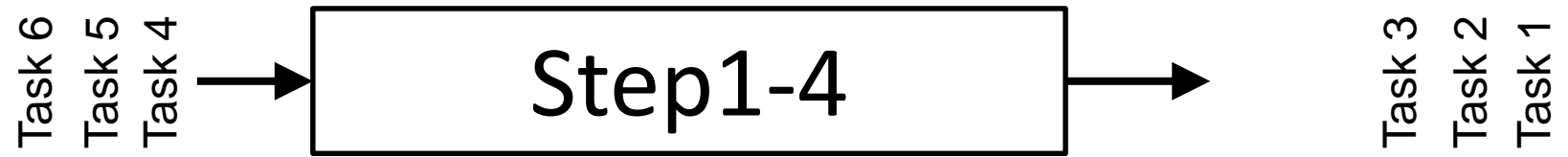
Without Pipeline



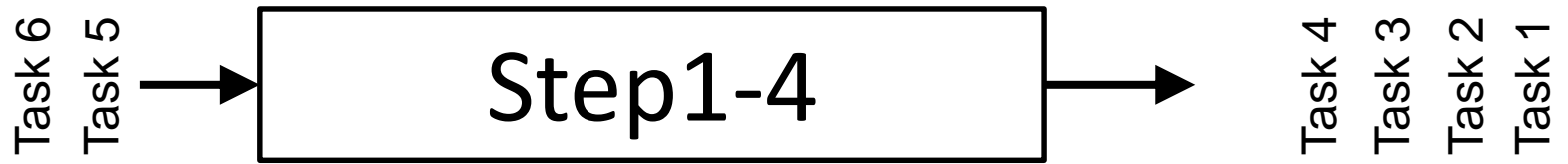
Without Pipeline



Without Pipeline



Without Pipeline



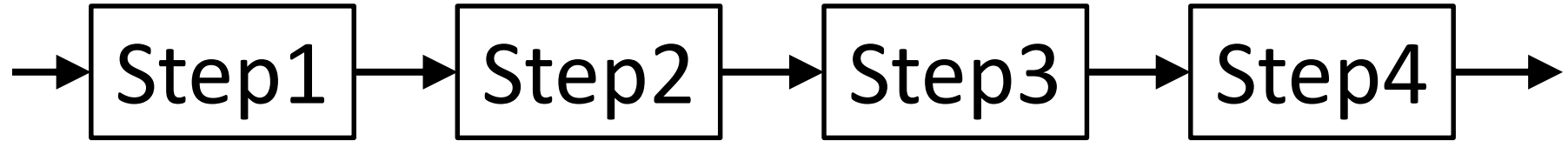
Without Pipeline



$$total_execution_time = task_execution_time * number_of_tasks$$

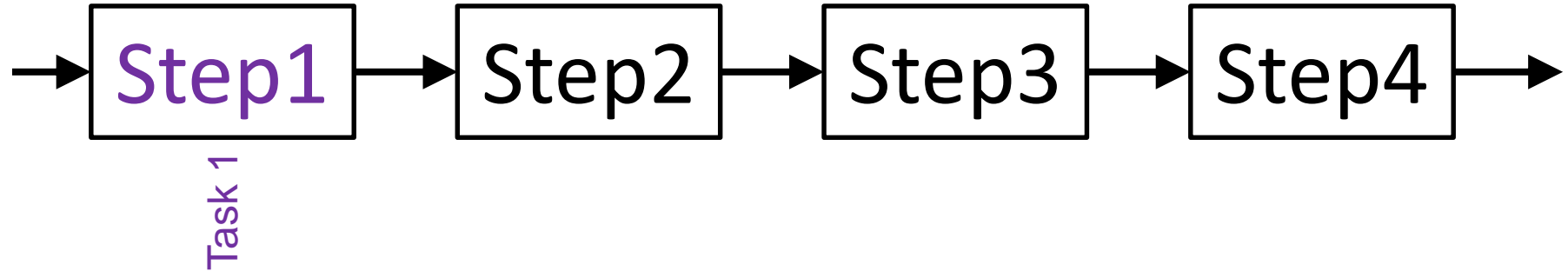
Pipeline

Task 6
Task 5
Task 4
Task 3
Task 2
Task 1



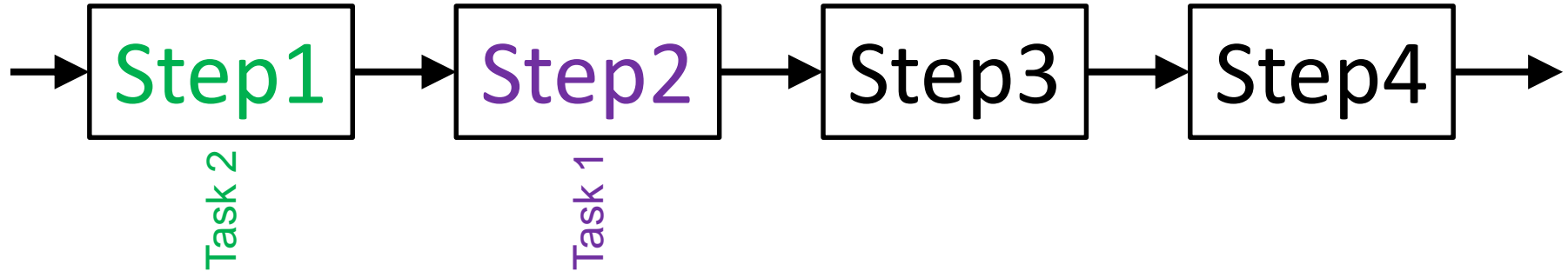
Pipeline

Task 6
Task 5
Task 4
Task 3
Task 2



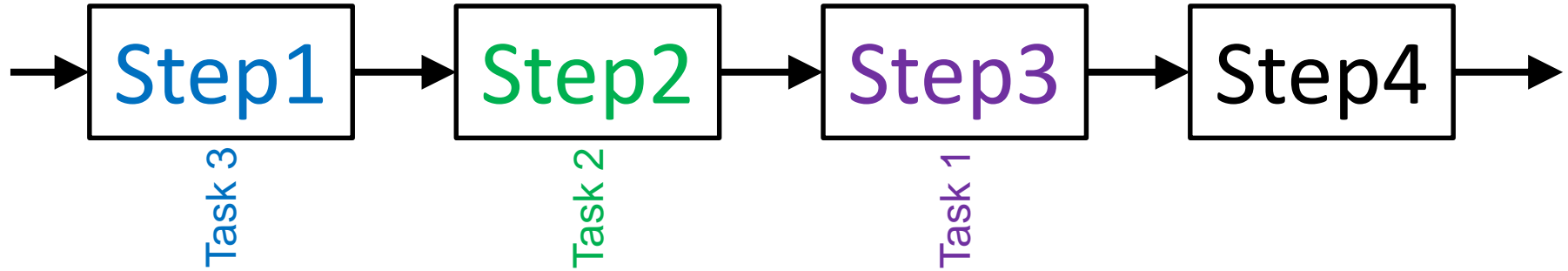
Pipeline

Task 6
Task 5
Task 4
Task 3



Pipeline

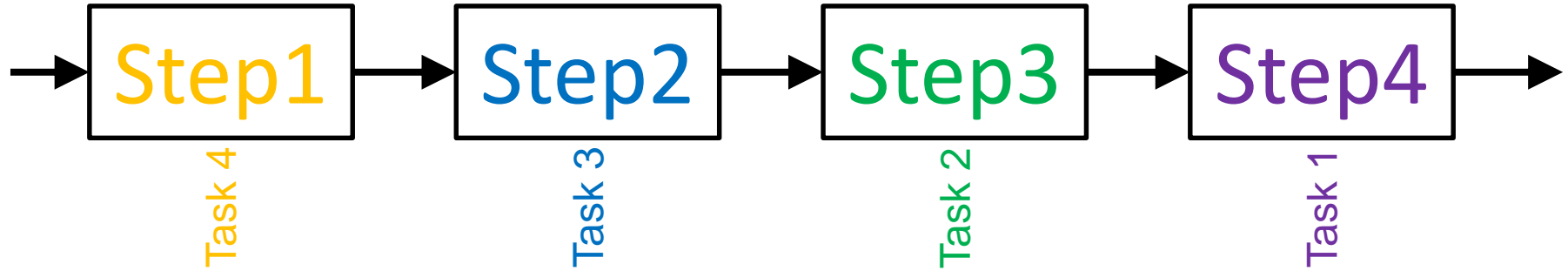
Task 6
Task 5
Task 4



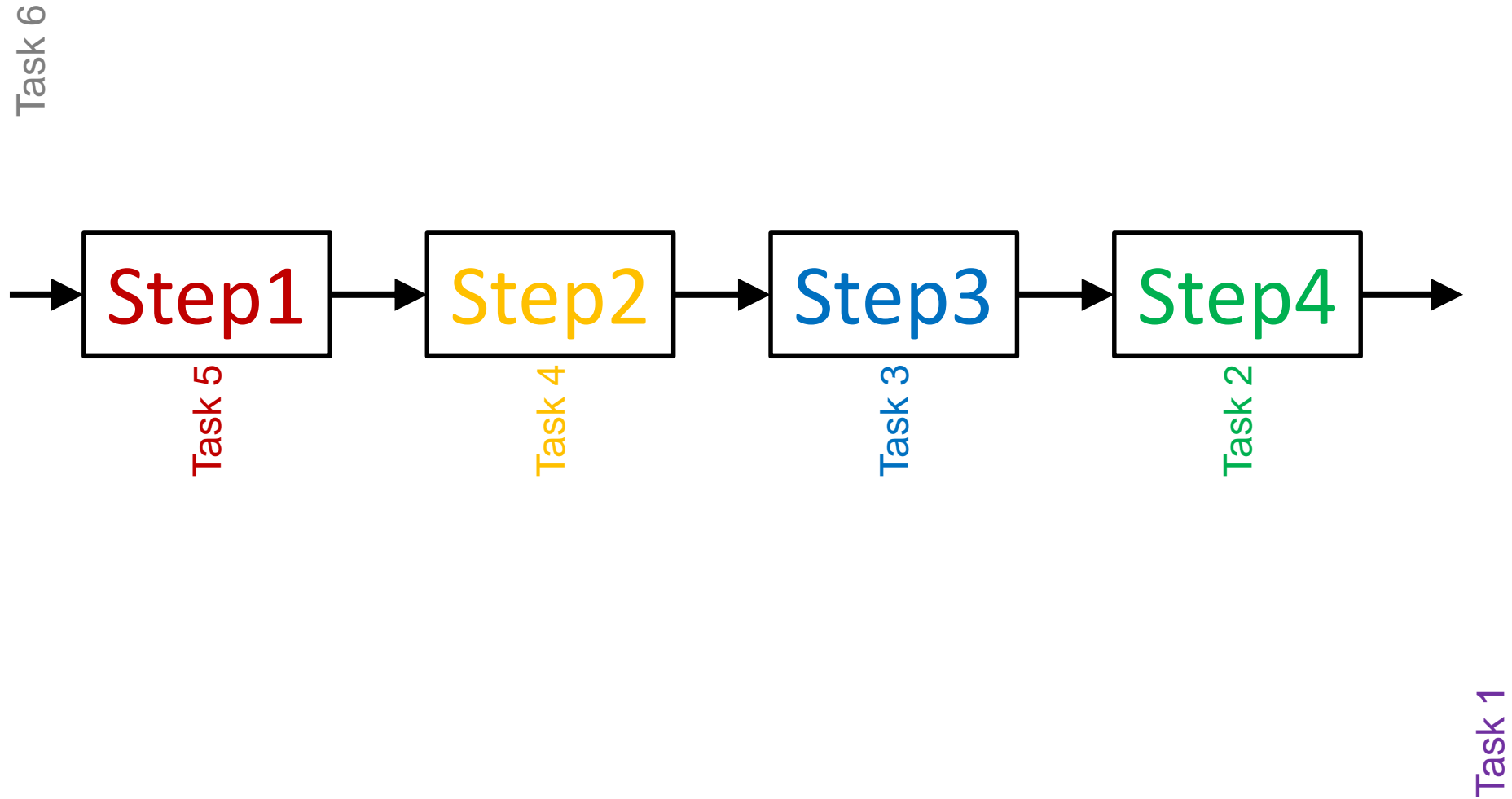
Pipeline

Task 6

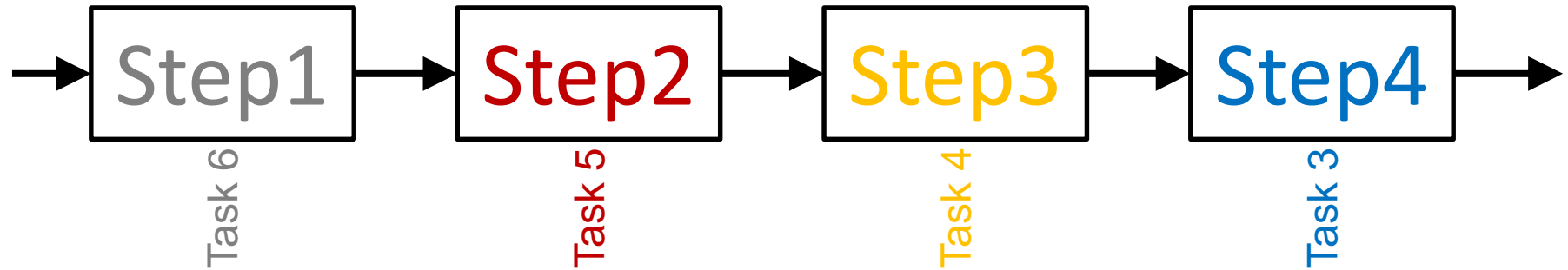
Task 5



Pipeline

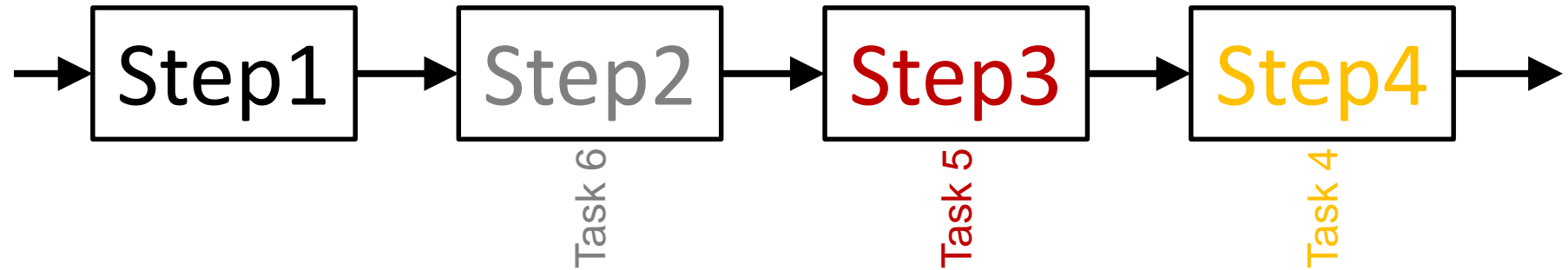


Pipeline



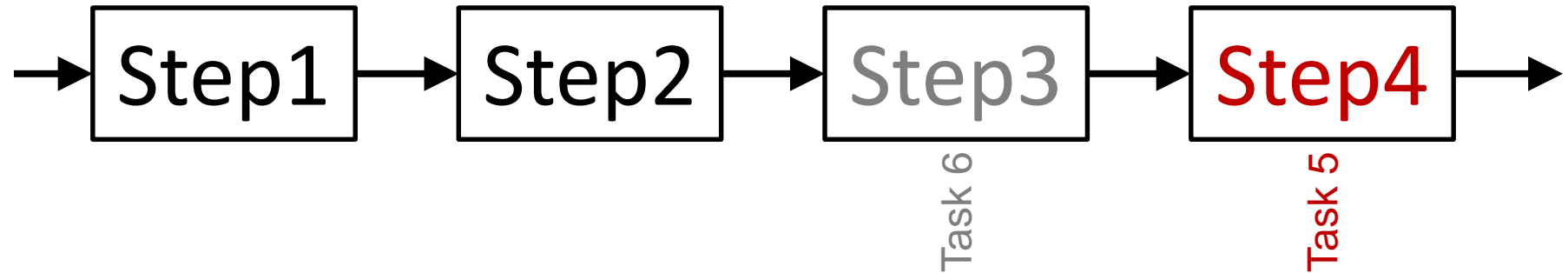
Task 2
Task 1

Pipeline



Task 3
Task 2
Task 1

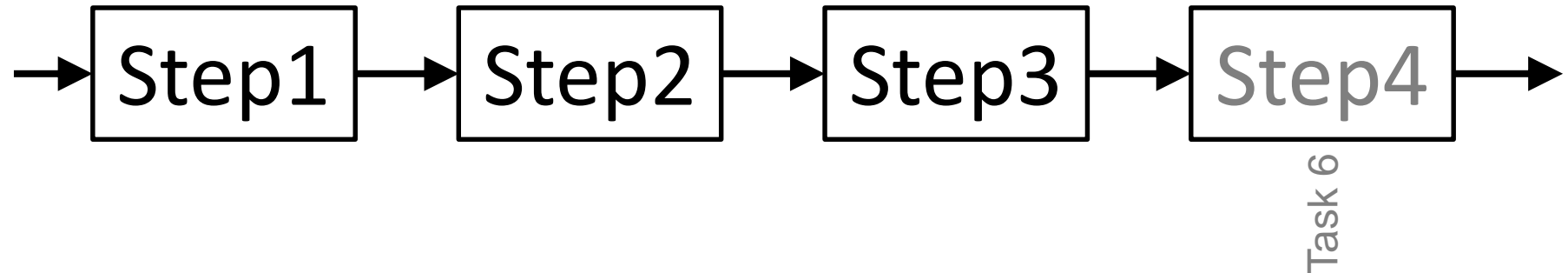
Pipeline



Task 4
Task 3
Task 2
Task 1

Pipeline

Ideal: $step_execution_time = \frac{task_execution_time}{number_of_steps}$



After *number_of_steps* tasks:

$$total_execution_time = number_of_tasks * step_execution_time$$

One task finishes at every “step tick”

Task 5
Task 4
Task 3
Task 2
Task 1