The Backflow Algorithm

Lecture 37
Section 8.5

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Outline

Definitions

Definition (Critical Path for a Vertex)

The critical path for a vertex is the path of longest processing time from that vertex to END.

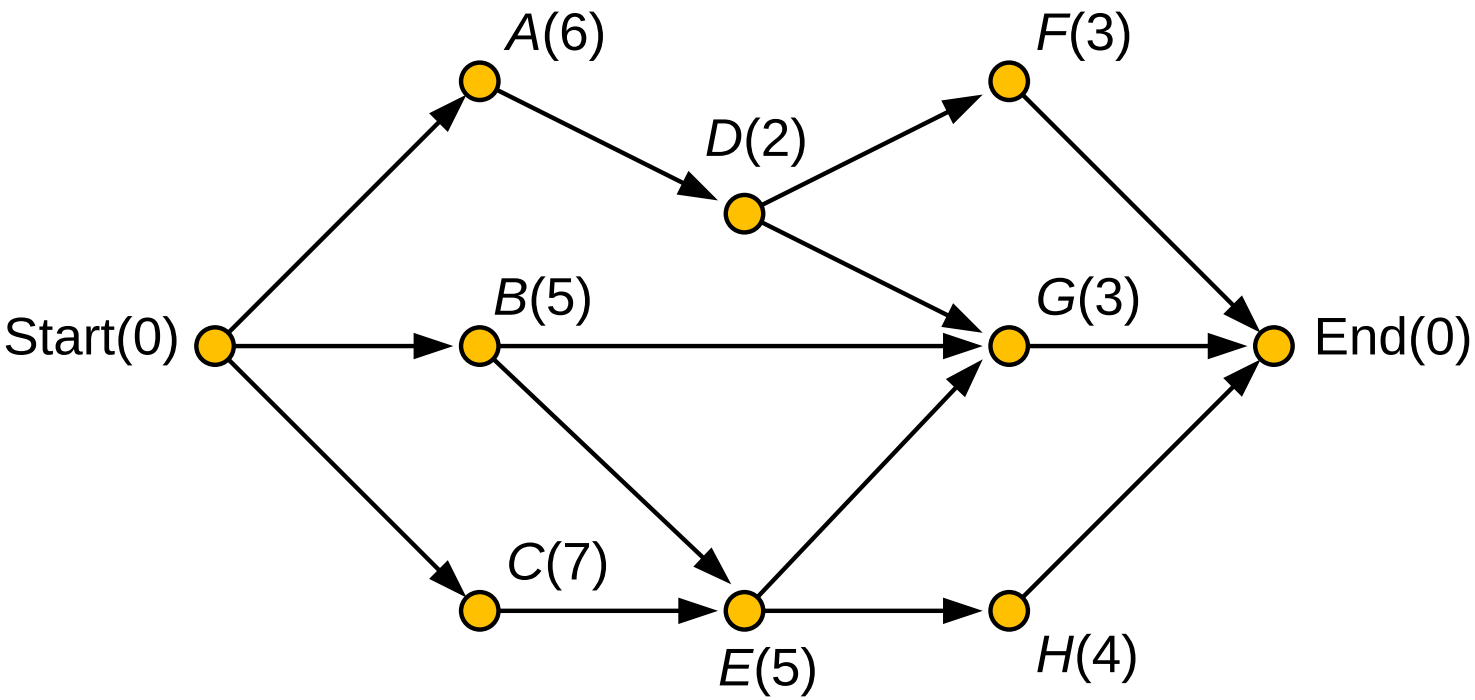
Definition (Critical Path for a Project)

The critical path for a project is the critical path from START to END.

Definition (Critical Time)

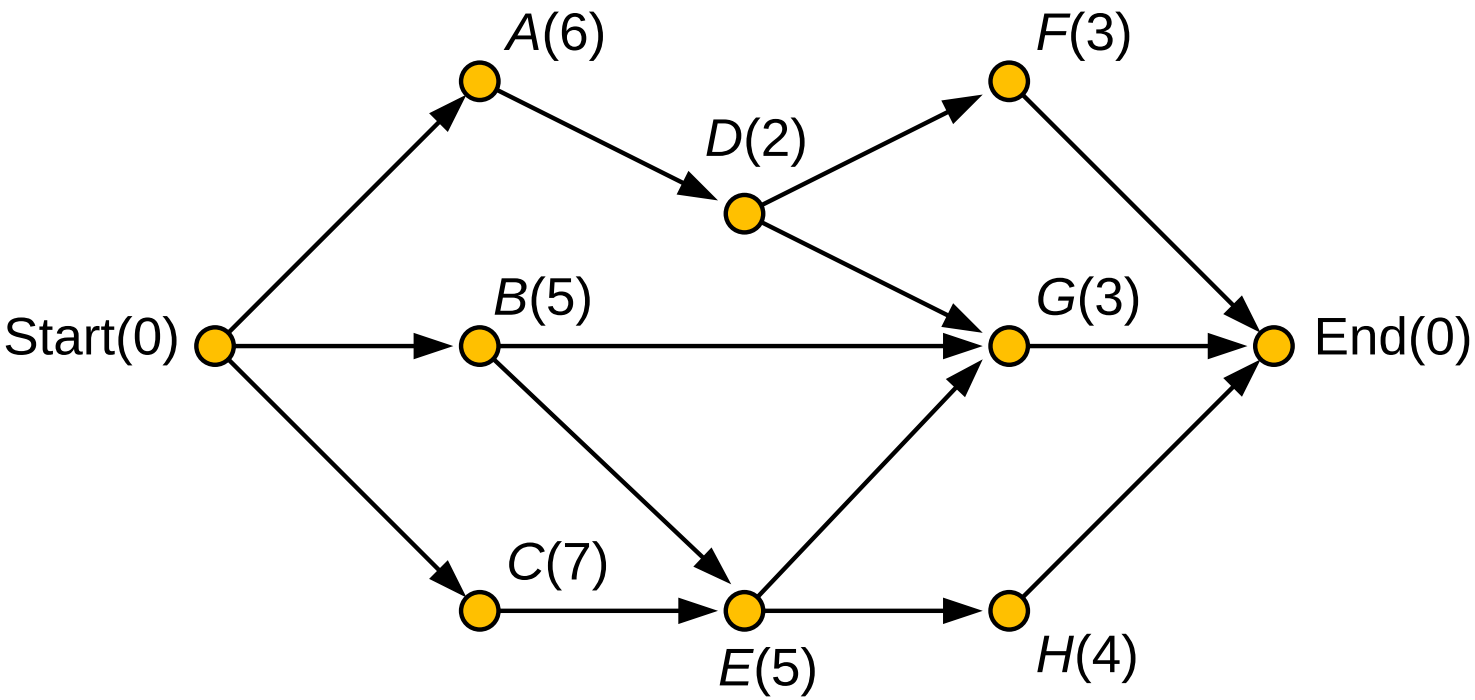
The critical time for a vertex or project is the processing time of its critical path.

Example



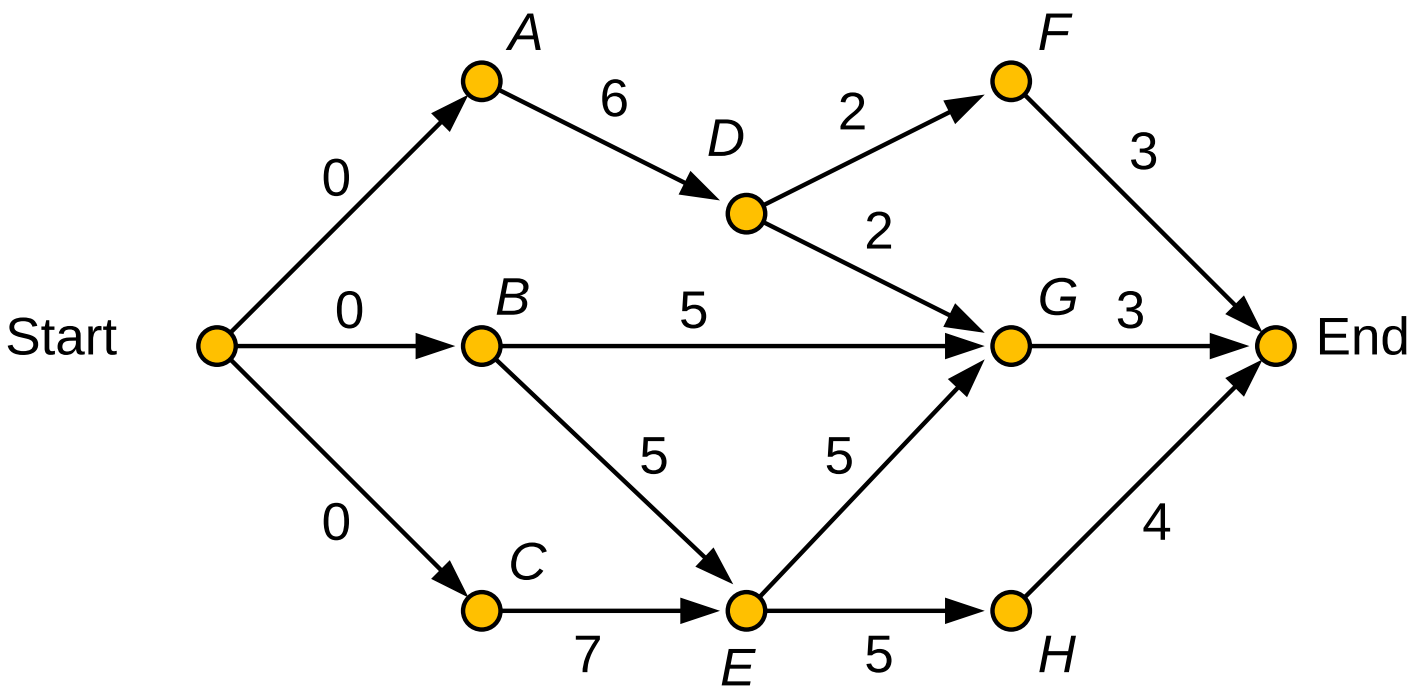
- The critical time of a project is the shortest possible time required to complete the project.

Example



- The critical time of a project is the shortest possible time required to complete the project.
- It is also the longest path (in terms of time) from START to END.

Example



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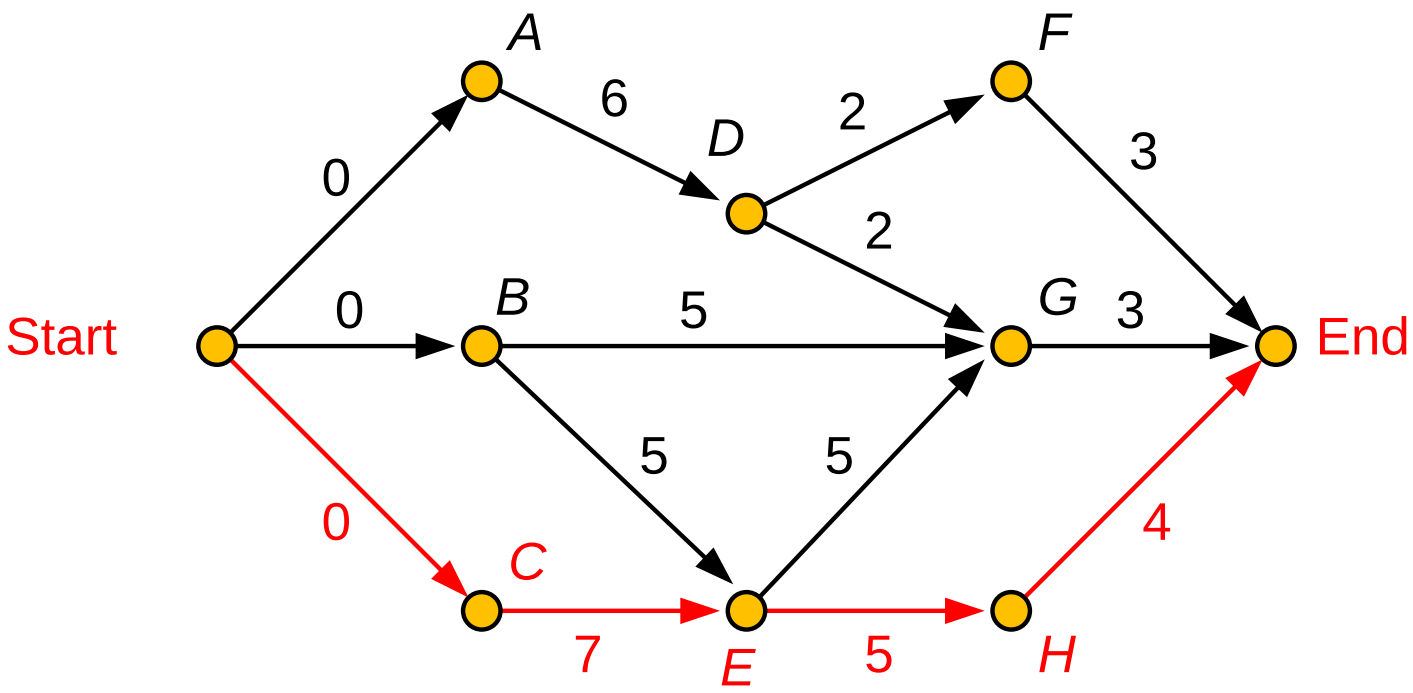

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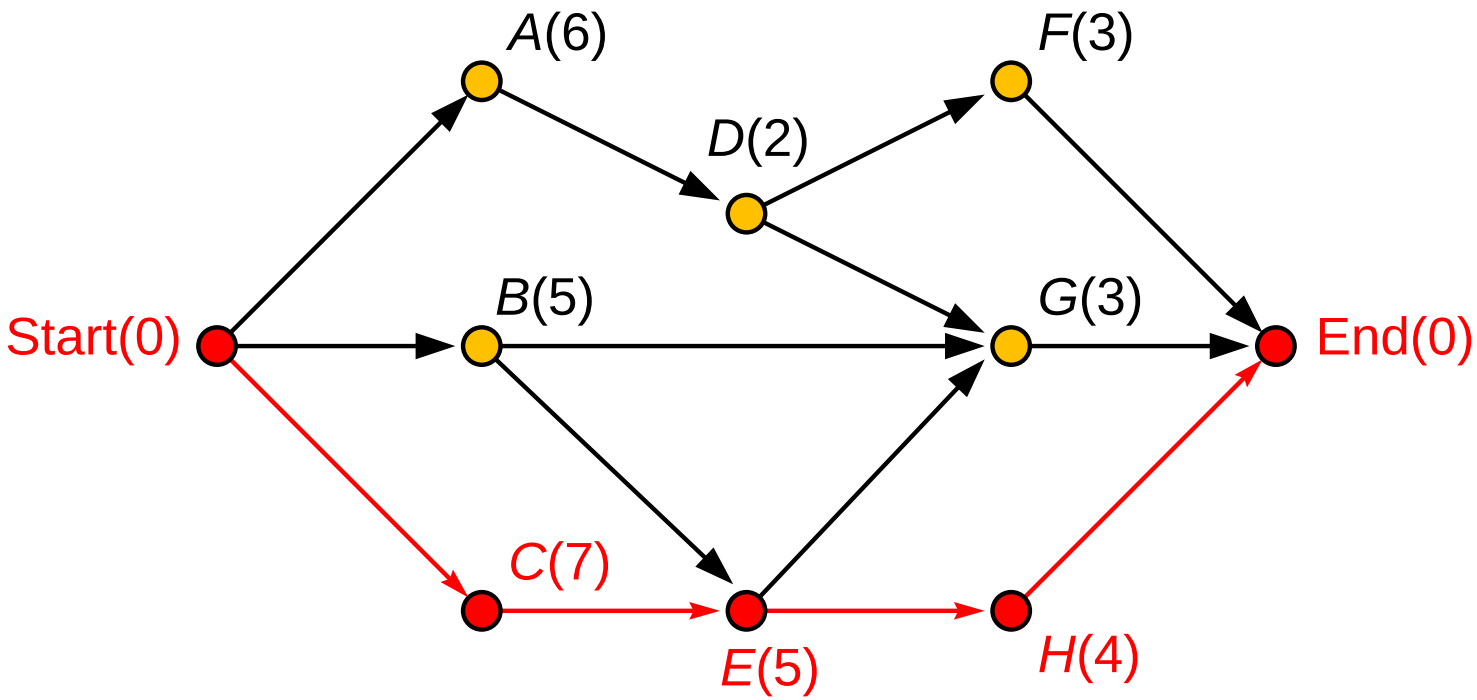


- The critical time of a project is the shortest possible time required to complete the project.
- It is also the longest path (in terms of time) from START to END.

Outline

The Backflow Algorithm

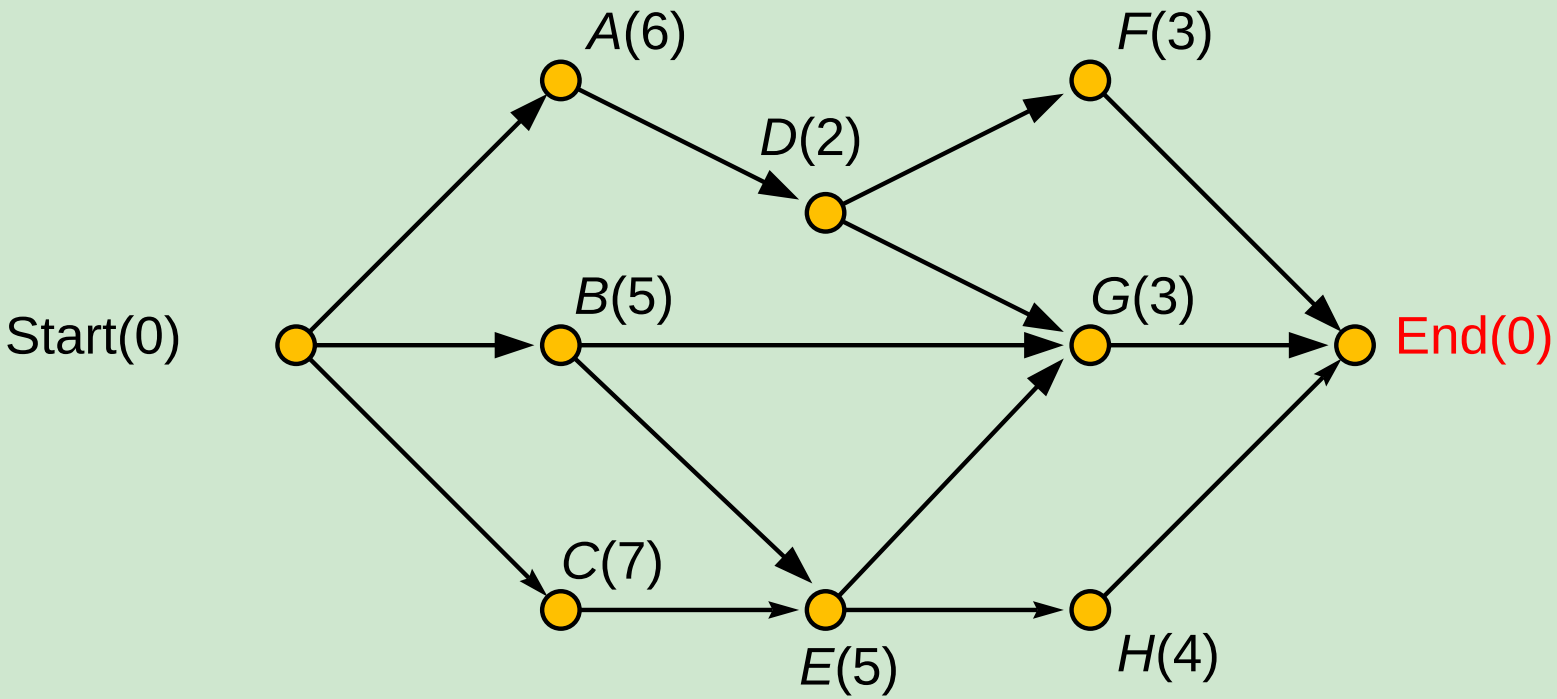
Definition (The Backflow Algorithm)

The backflow algorithm finds the critical path by the following method.

1. Beginning with END and working back to START, find the critical time for each vertex.
   - The critical time for a vertex is the processing time for that vertex plus the largest critical time of its immediate successors.
2. The critical path for the project is the path from START to END whose edges connect each vertex to its successor with the greatest critical time.

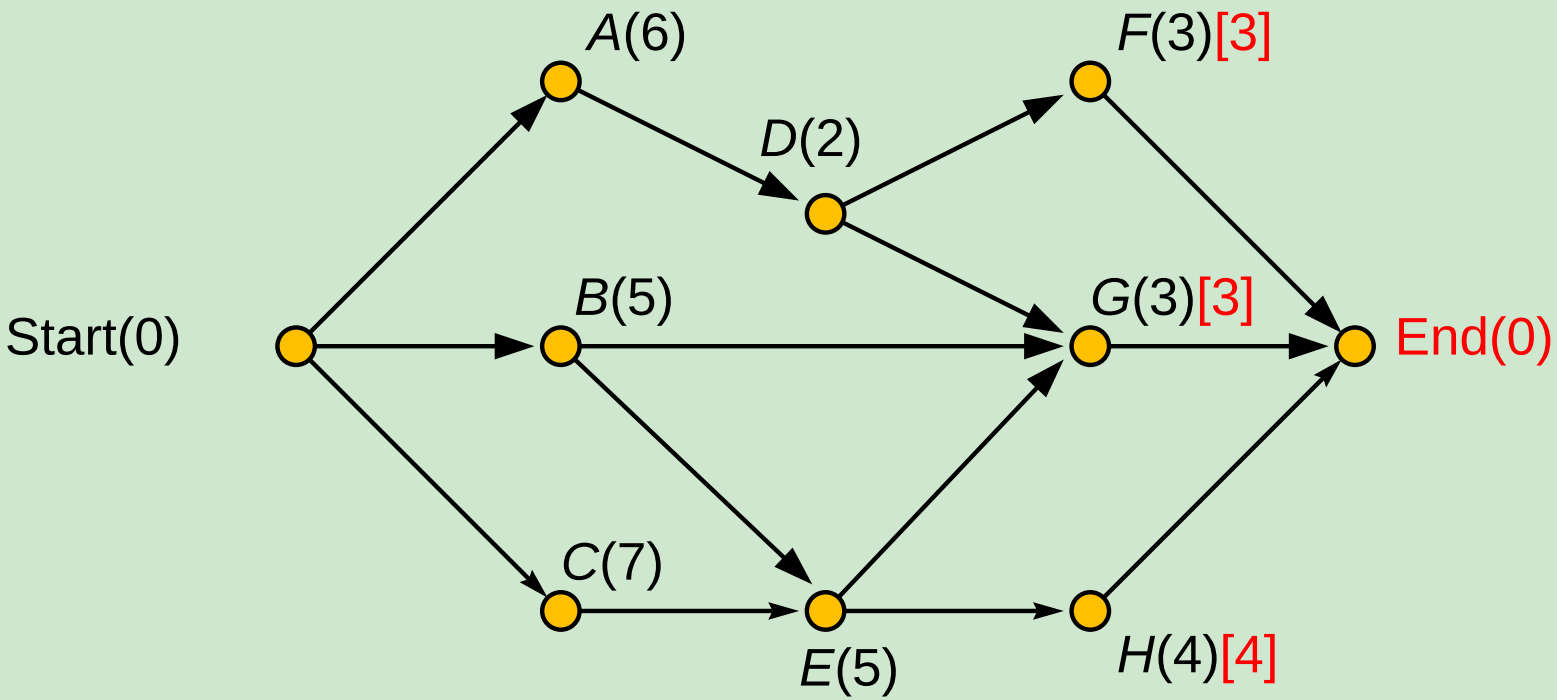
The Backflow Algorithm

Example (The Backflow Algorithm)



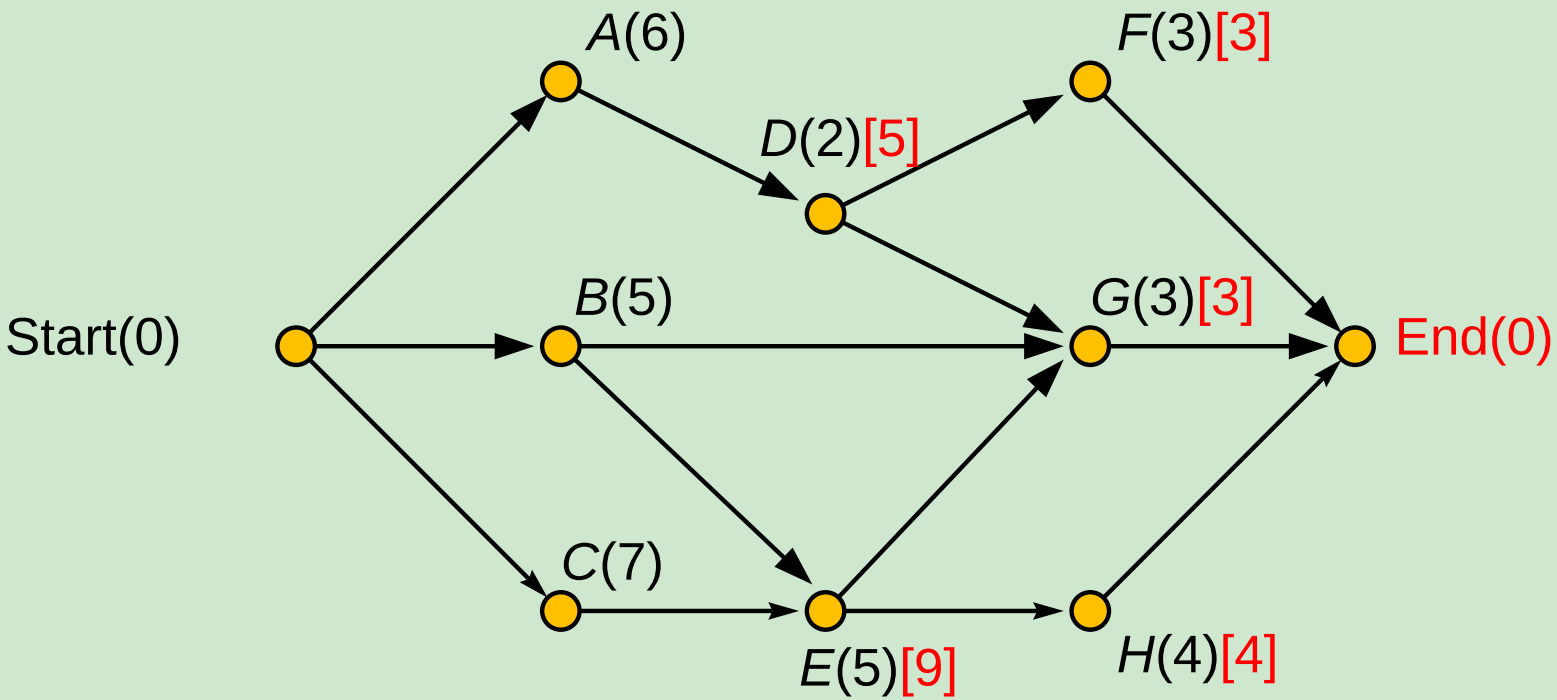
The Backflow Algorithm

Example (The Backflow Algorithm)



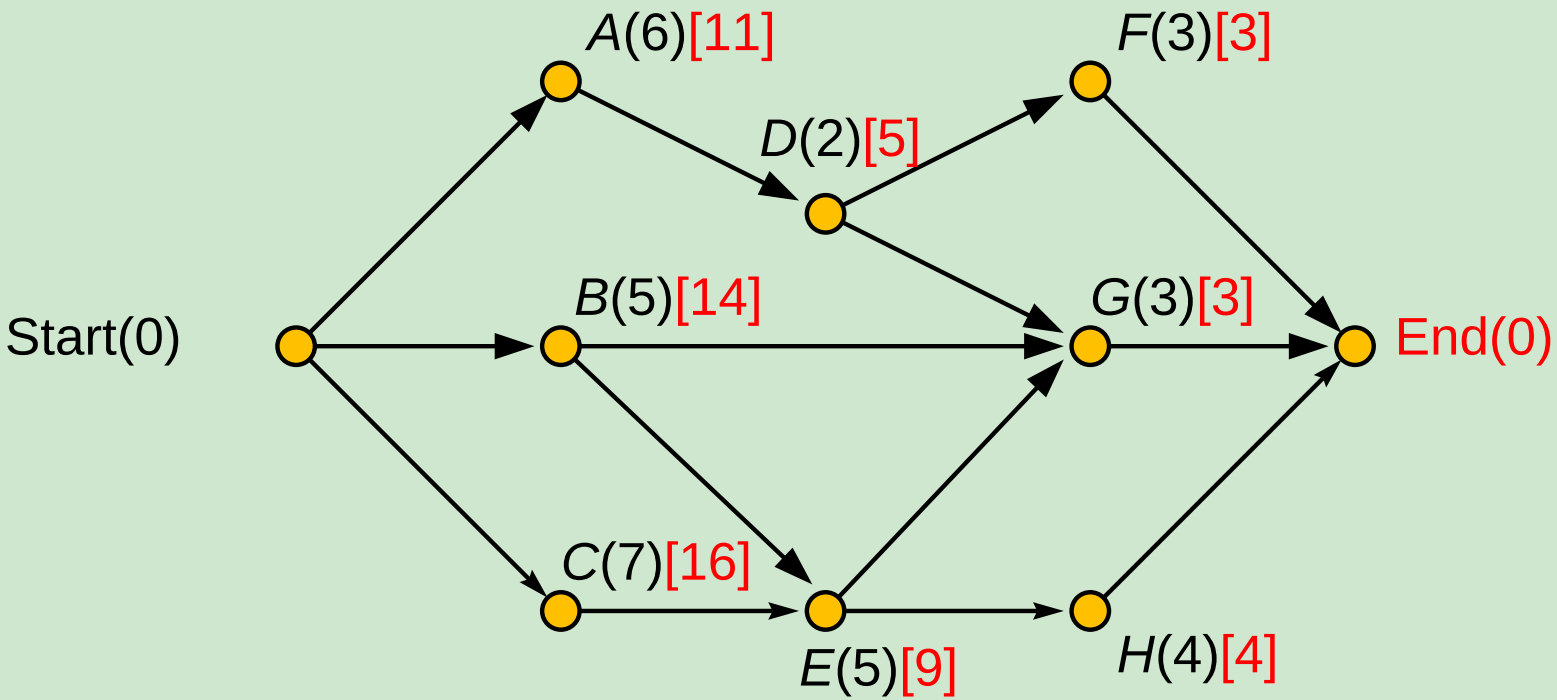
The Backflow Algorithm

Example (The Backflow Algorithm)



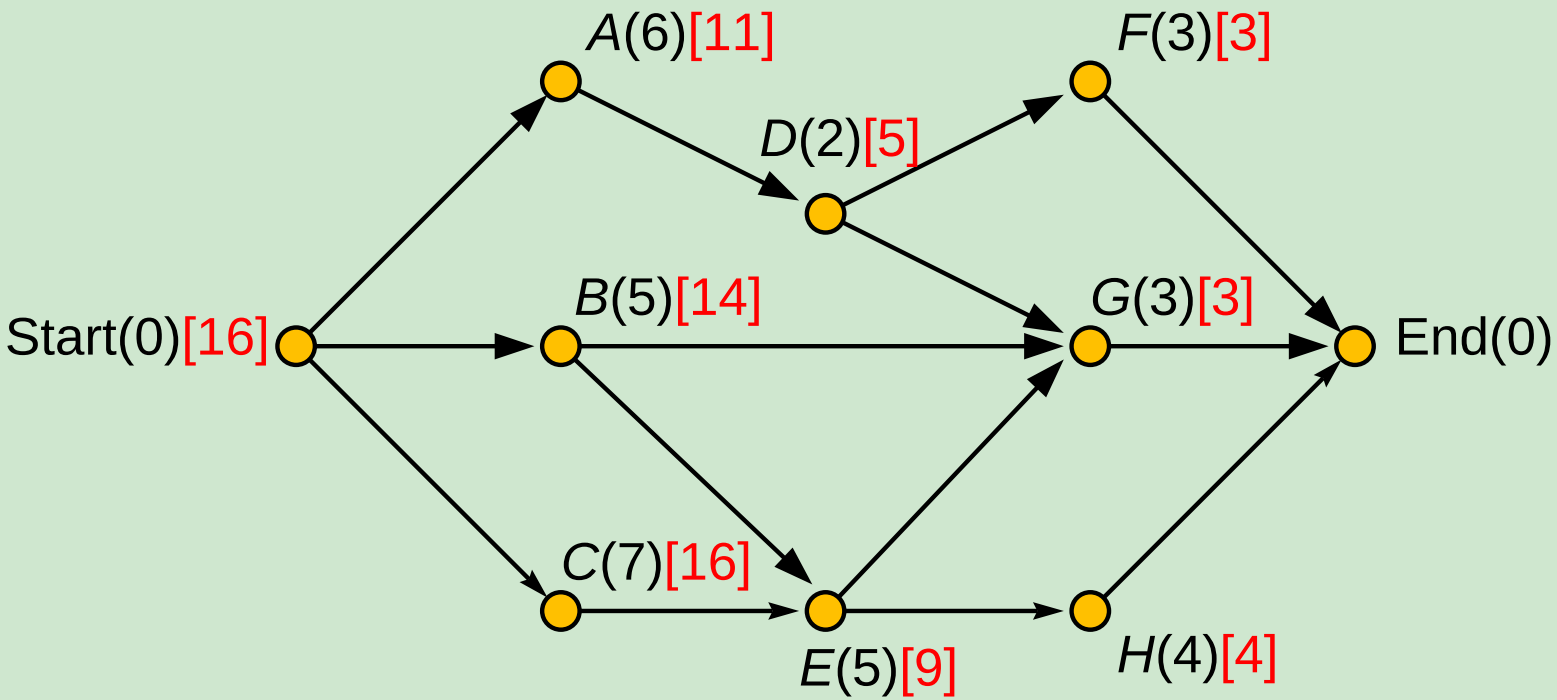
The Backflow Algorithm

Example (The Backflow Algorithm)



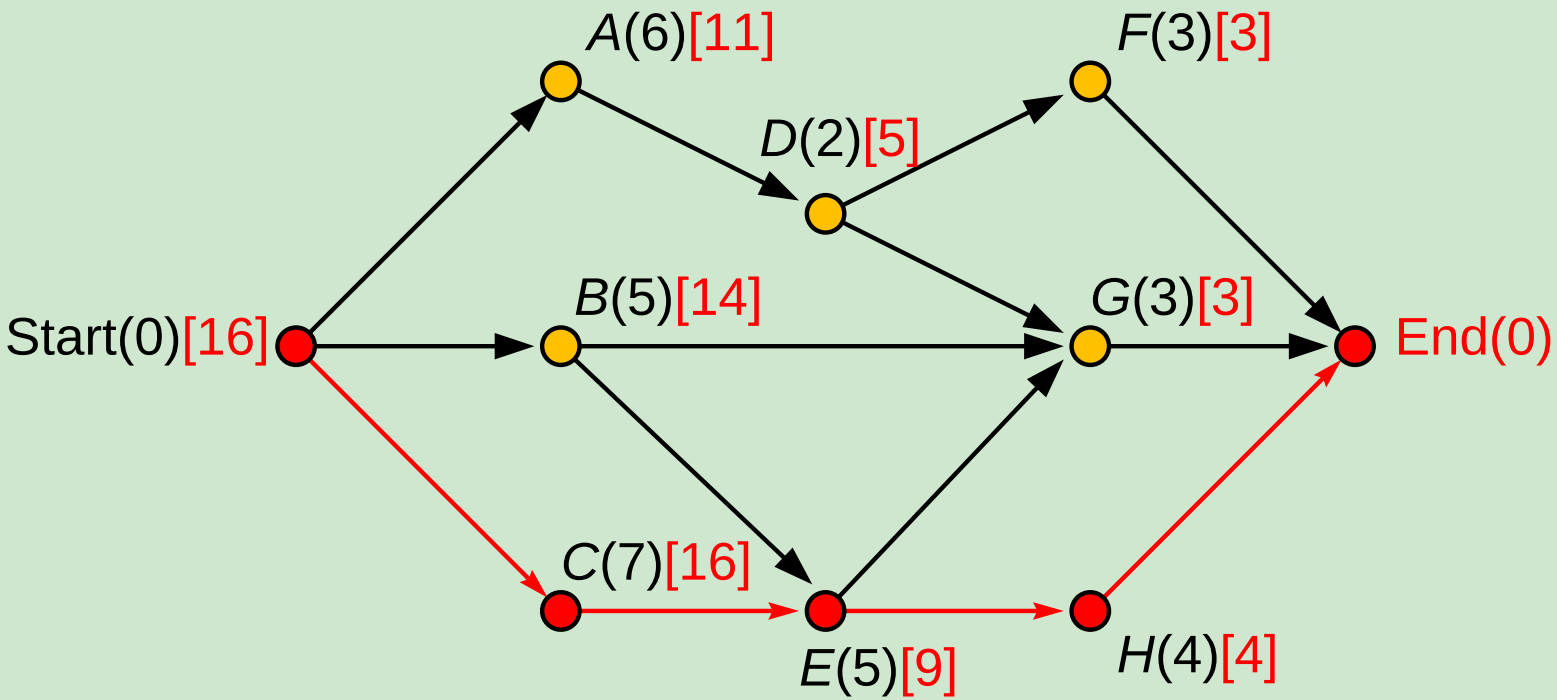
The Backflow Algorithm

Example (The Backflow Algorithm)



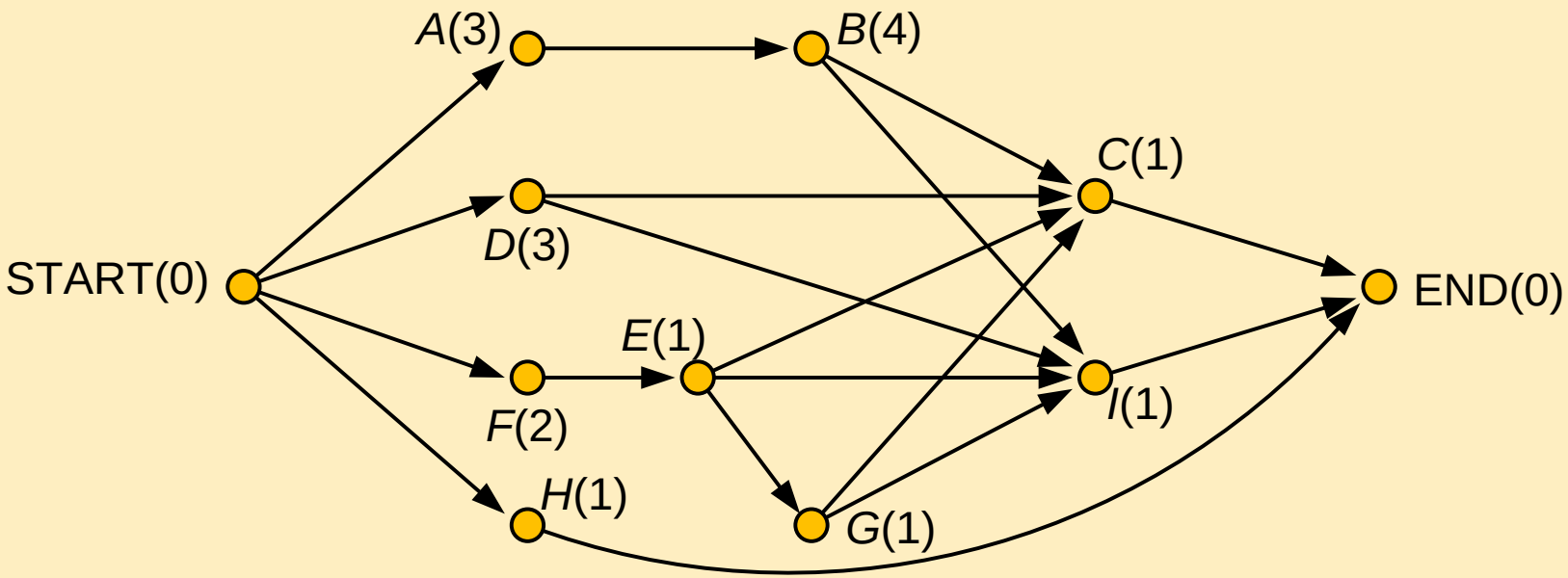
The Backflow Algorithm

Example (The Backflow Algorithm)



Example

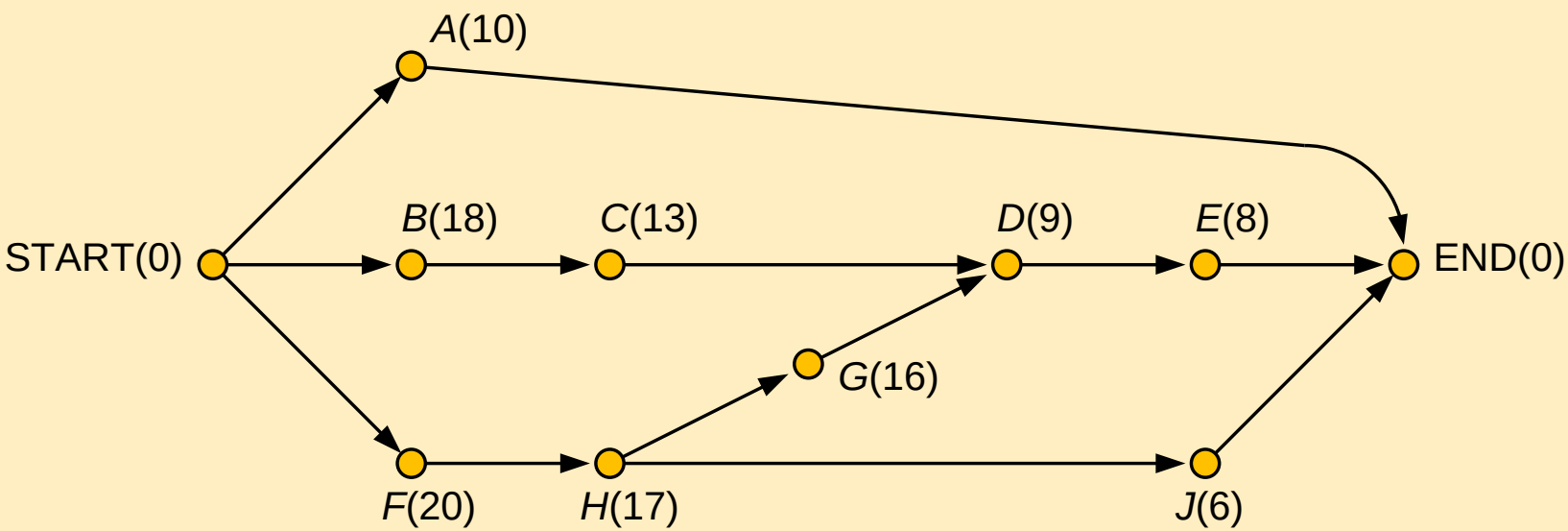
Planning a Meeting



Outline

Practice

Practice



- Use the Backflow Algorithm to find the critical path.

Outline

Assignment

Assignment

- Chapter 8: Exercises 49, 50, 51, 52, 56.