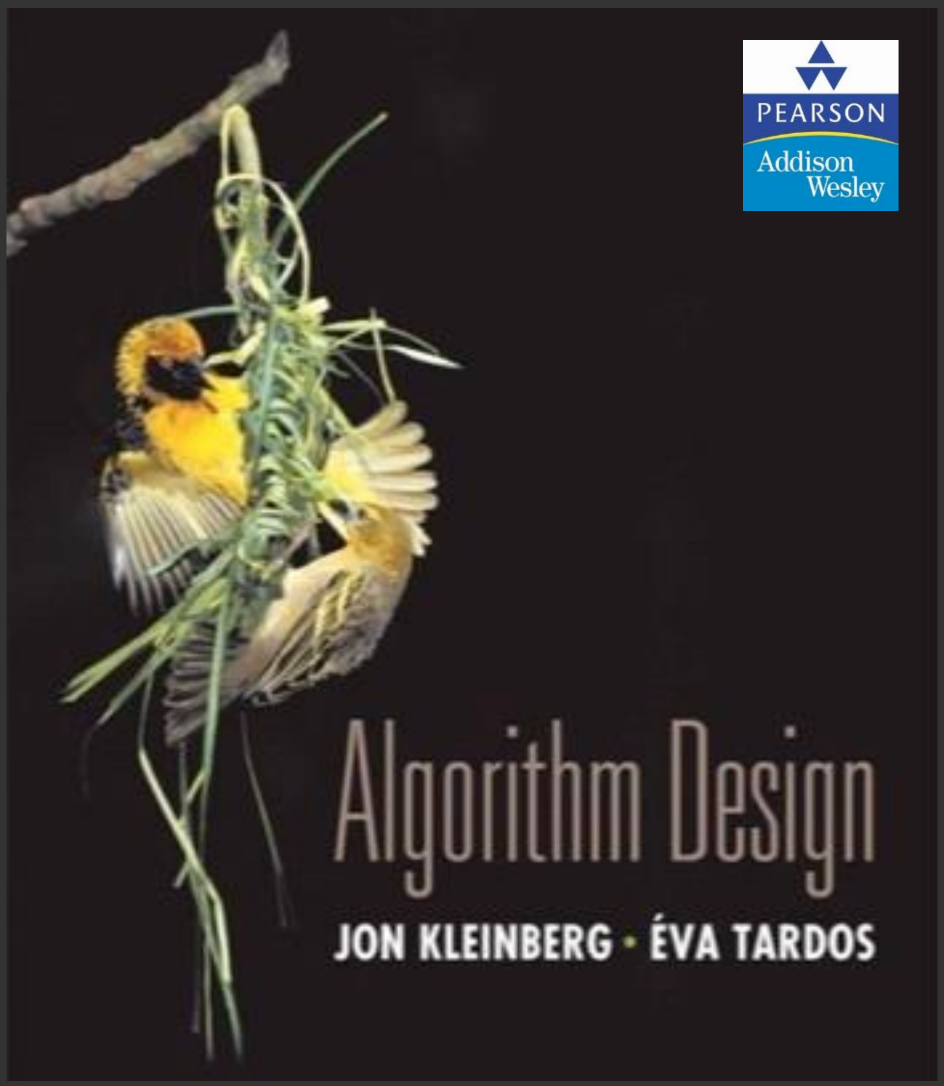

4. Greedy Algorithms II

- *Dijkstra's algorithm demo*
- *improved Dijkstra's algorithm demo*

Lecture slides by Kevin Wayne
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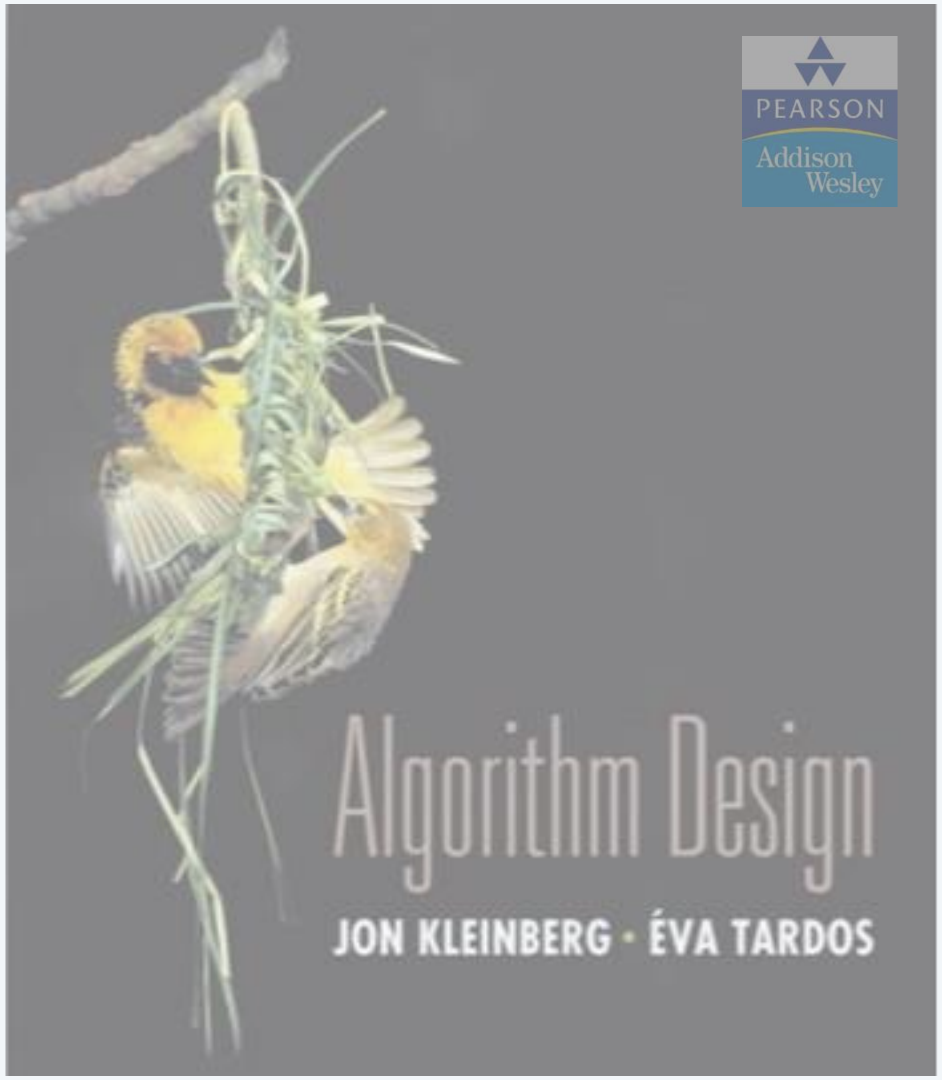
http://www.cs.princeton.edu/~wayne/kleinberg-tardos



4. Greedy Algorithms II

- *Dijkstra's algorithm demo*
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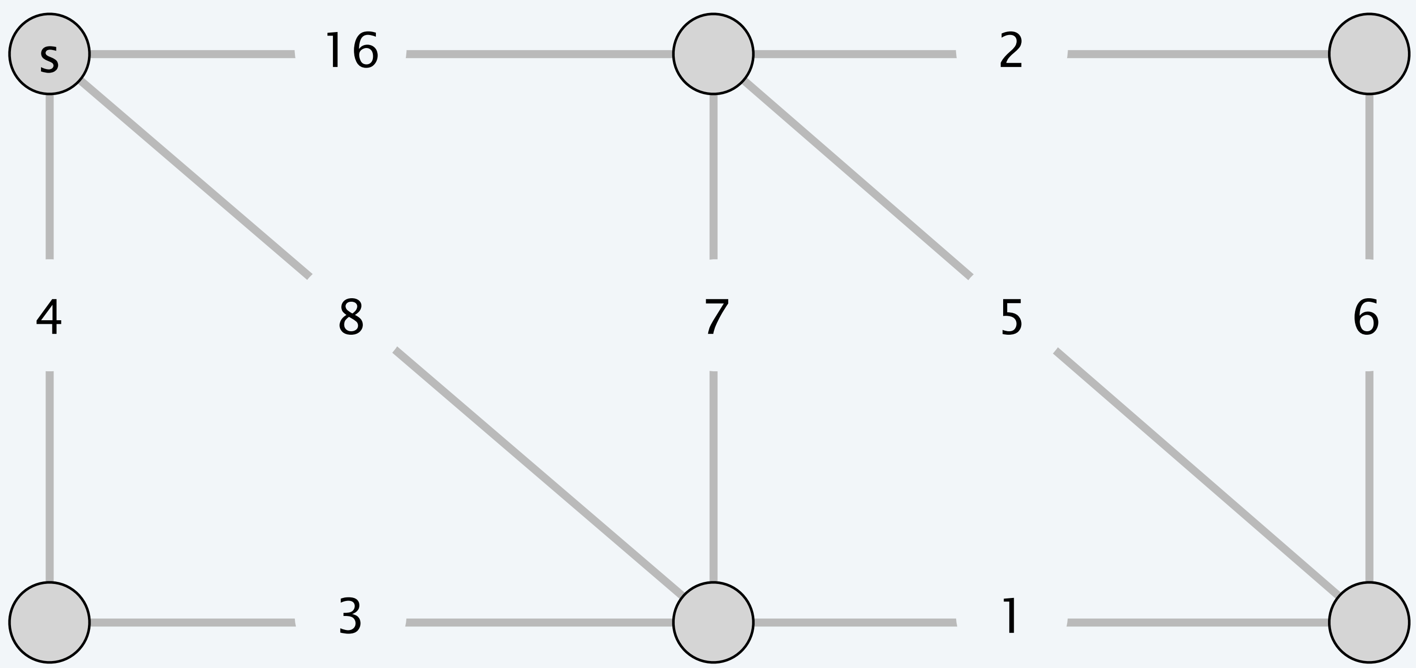
Dijkstra's algorithm demo

- Initialize $S = \{ s \}$, $d(s) = 0$.
- Repeatedly choose unexplored node v which minimizes

$$\pi(v) = \min_{e = (u,v) : u \in S} d(u) + \ell_e ,$$

add v to S; set $d(v) = \pi(v)$.



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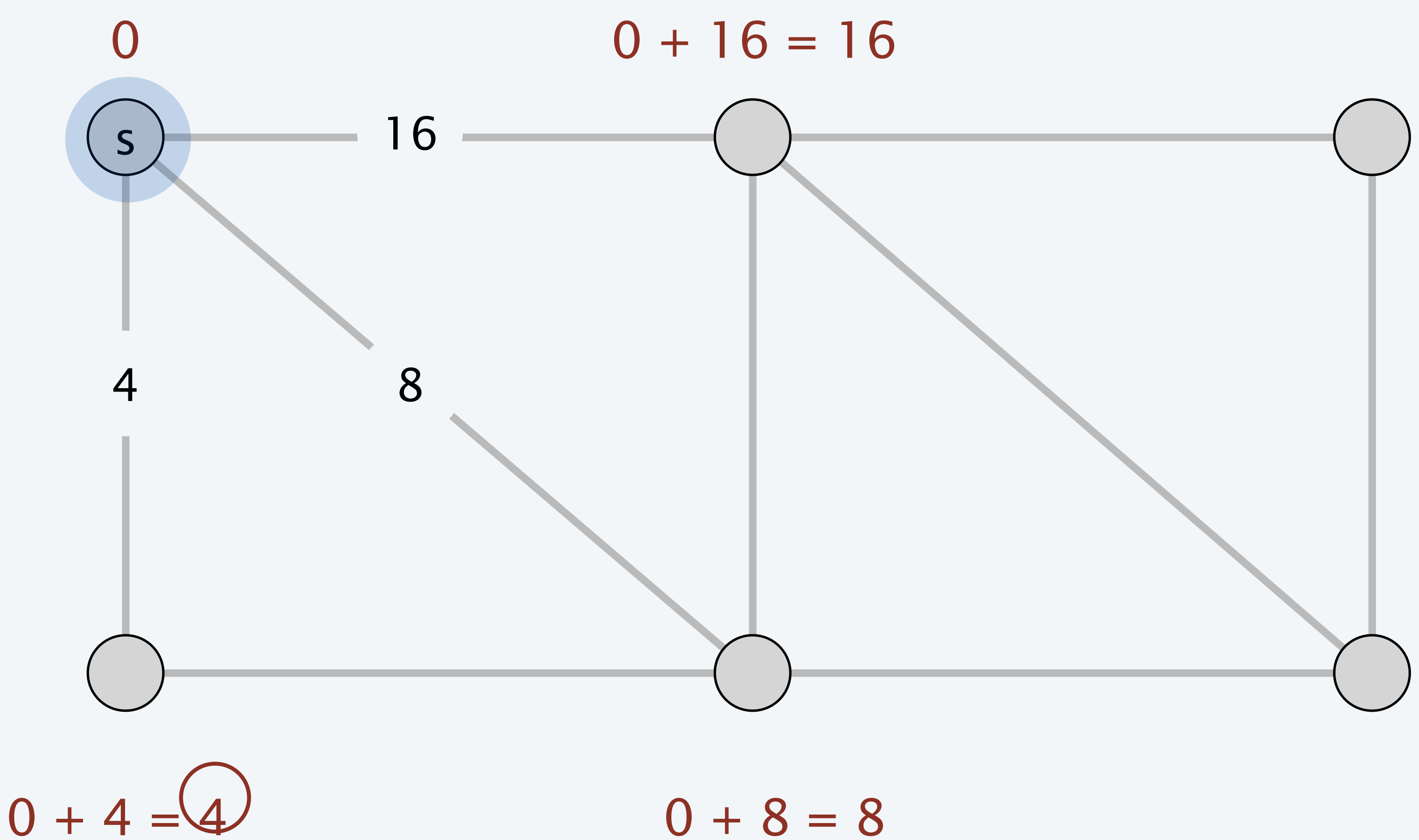

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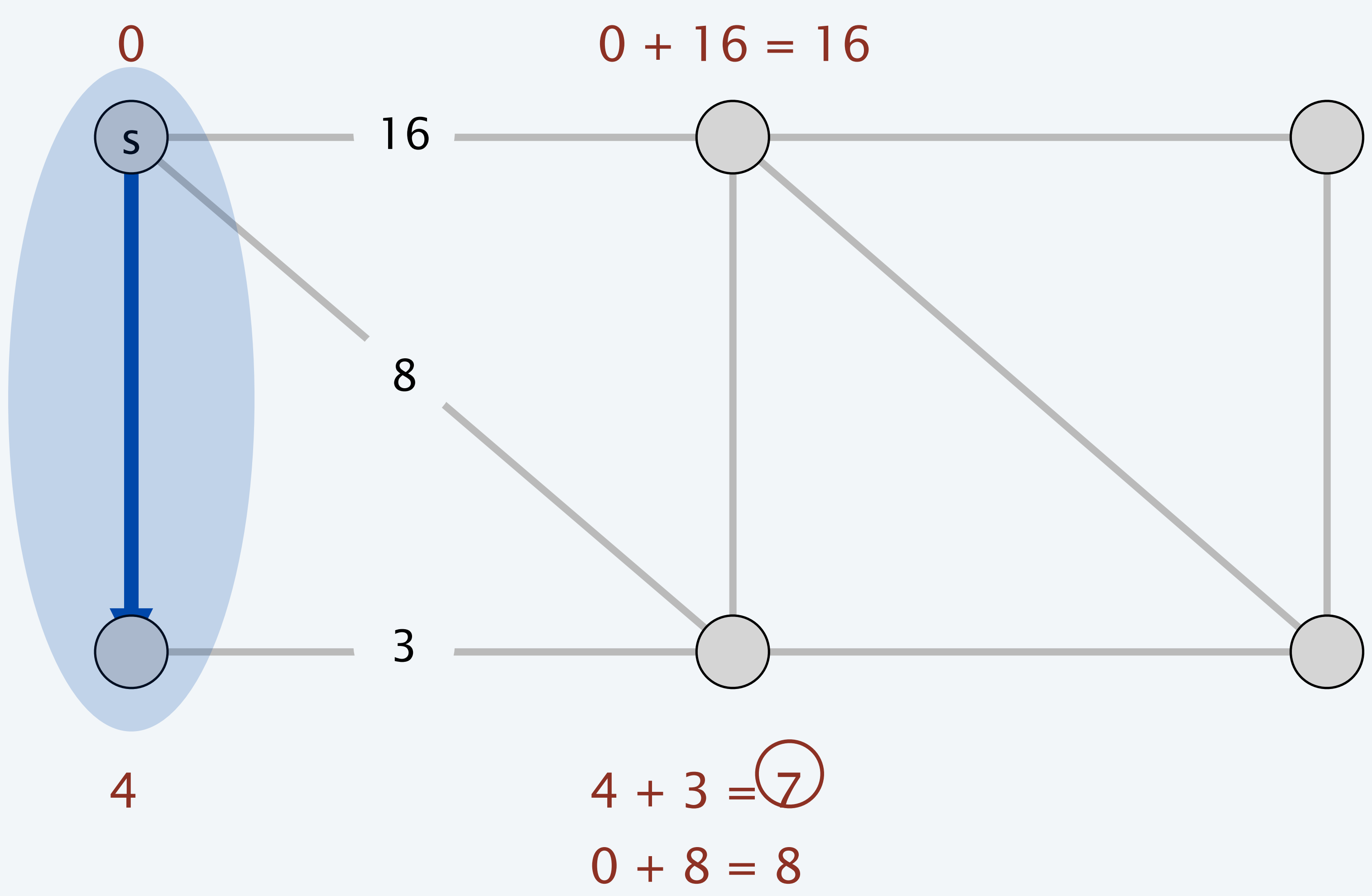

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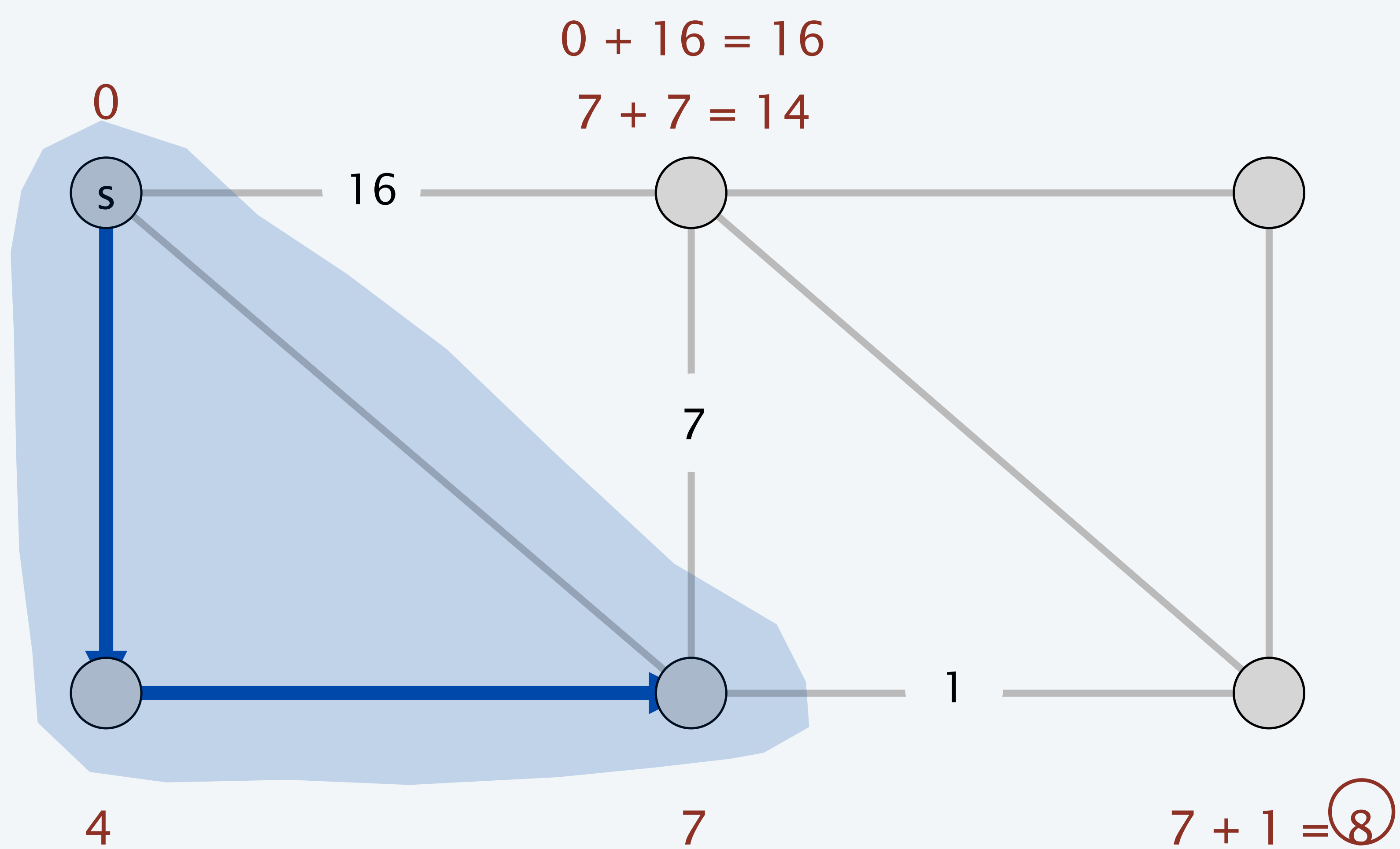

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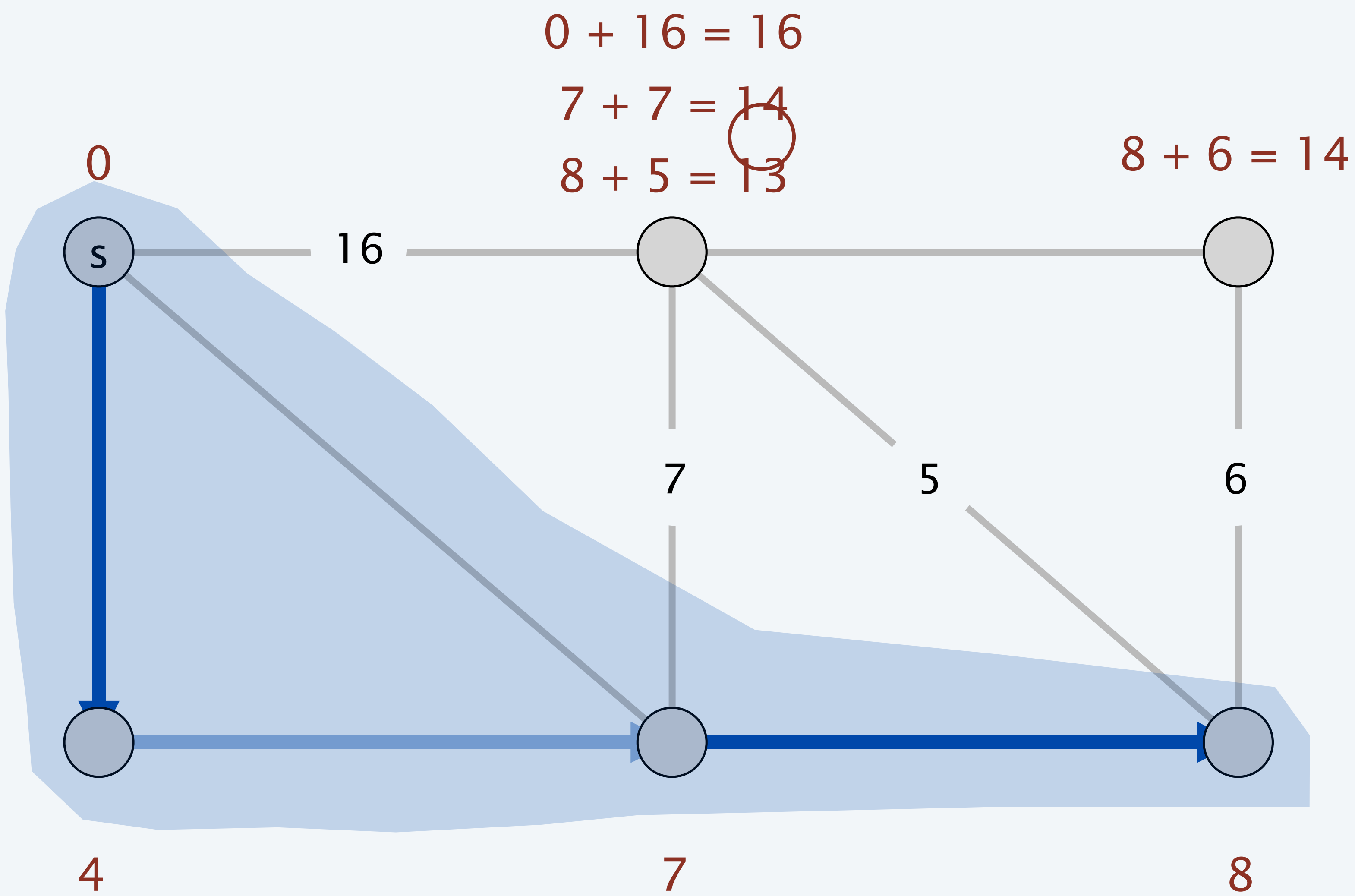

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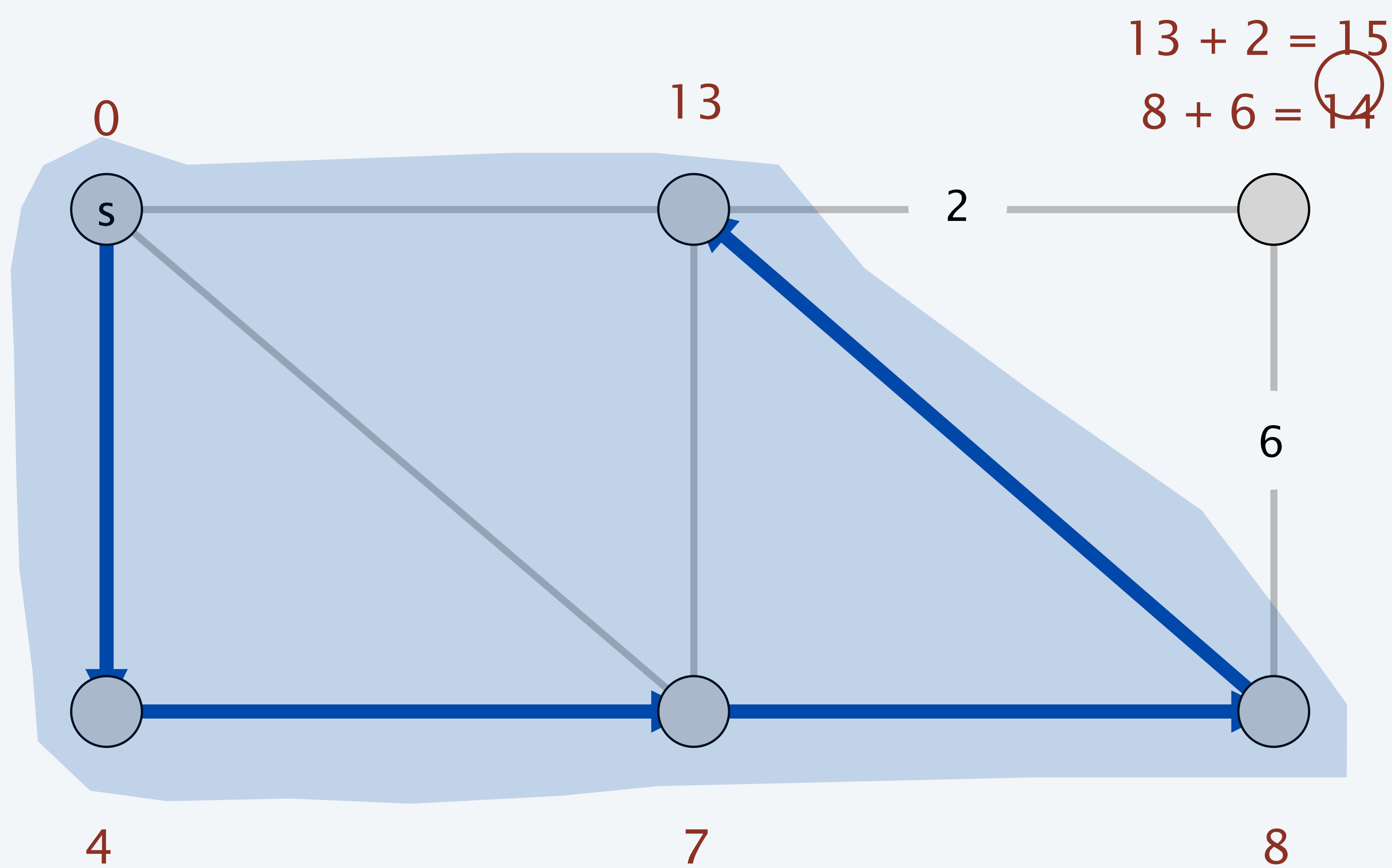

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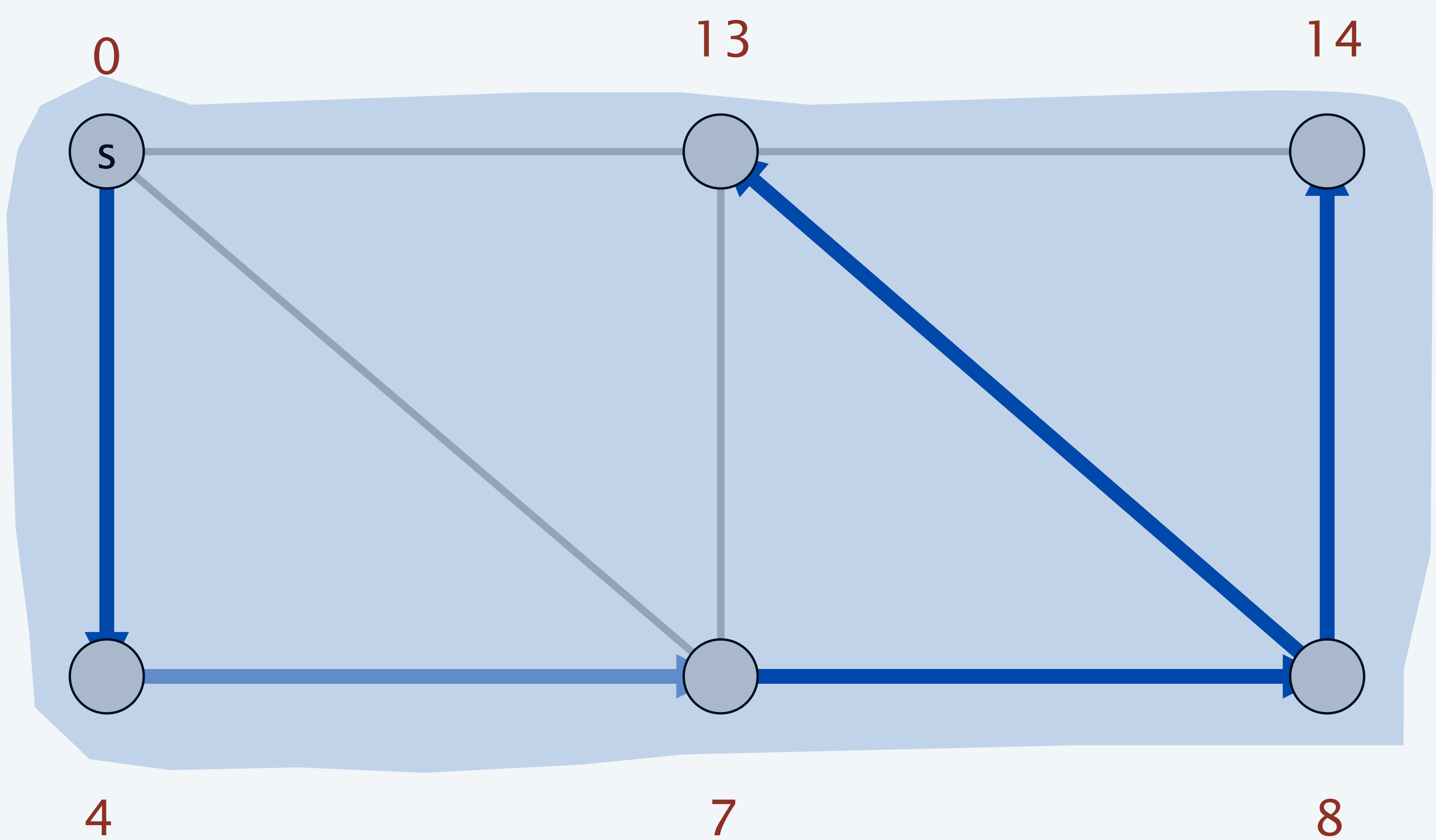

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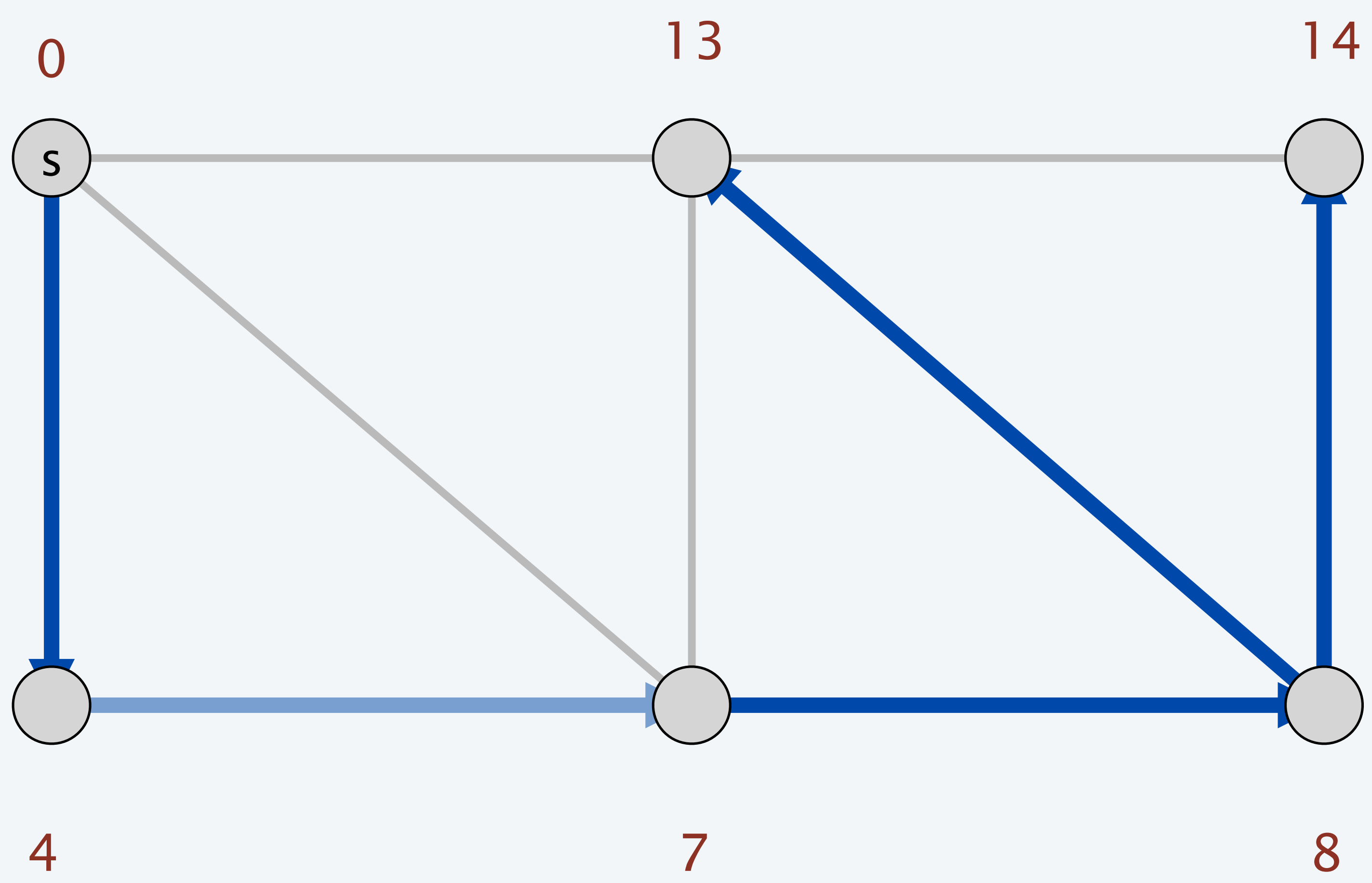
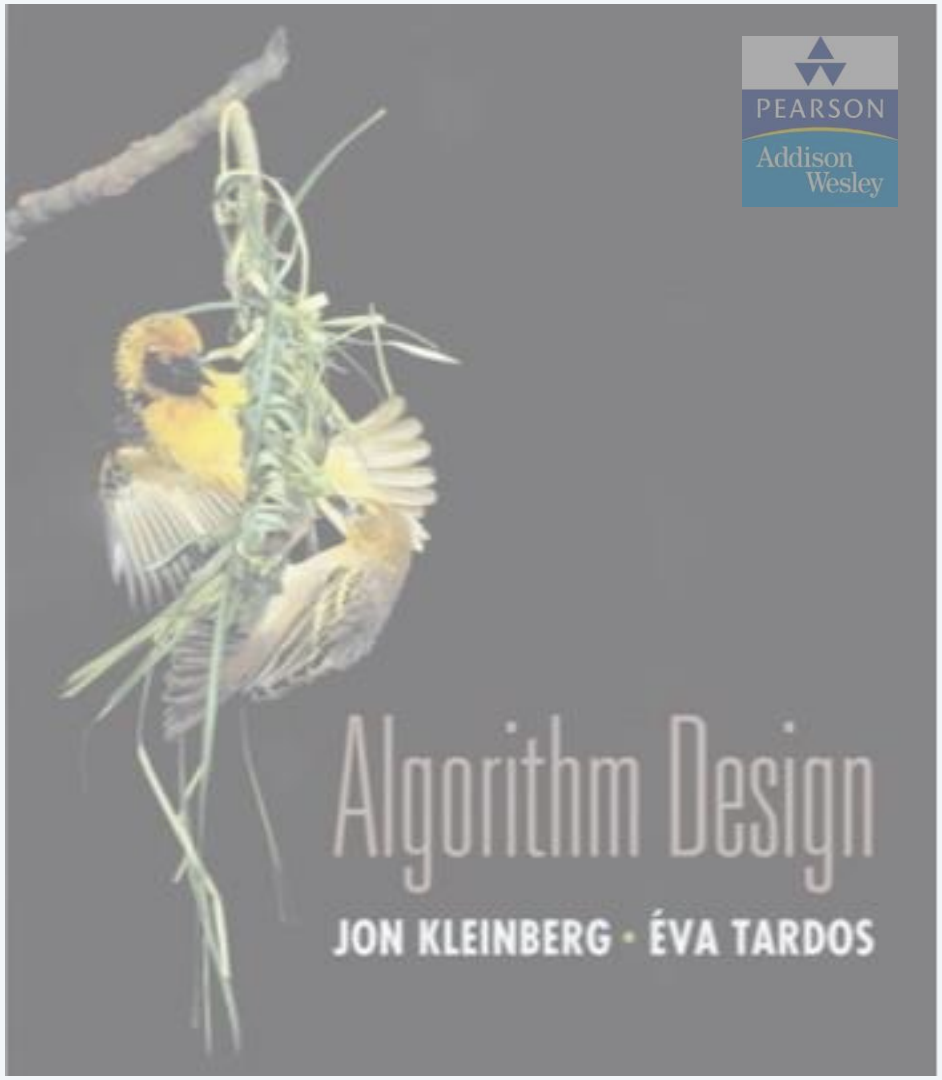


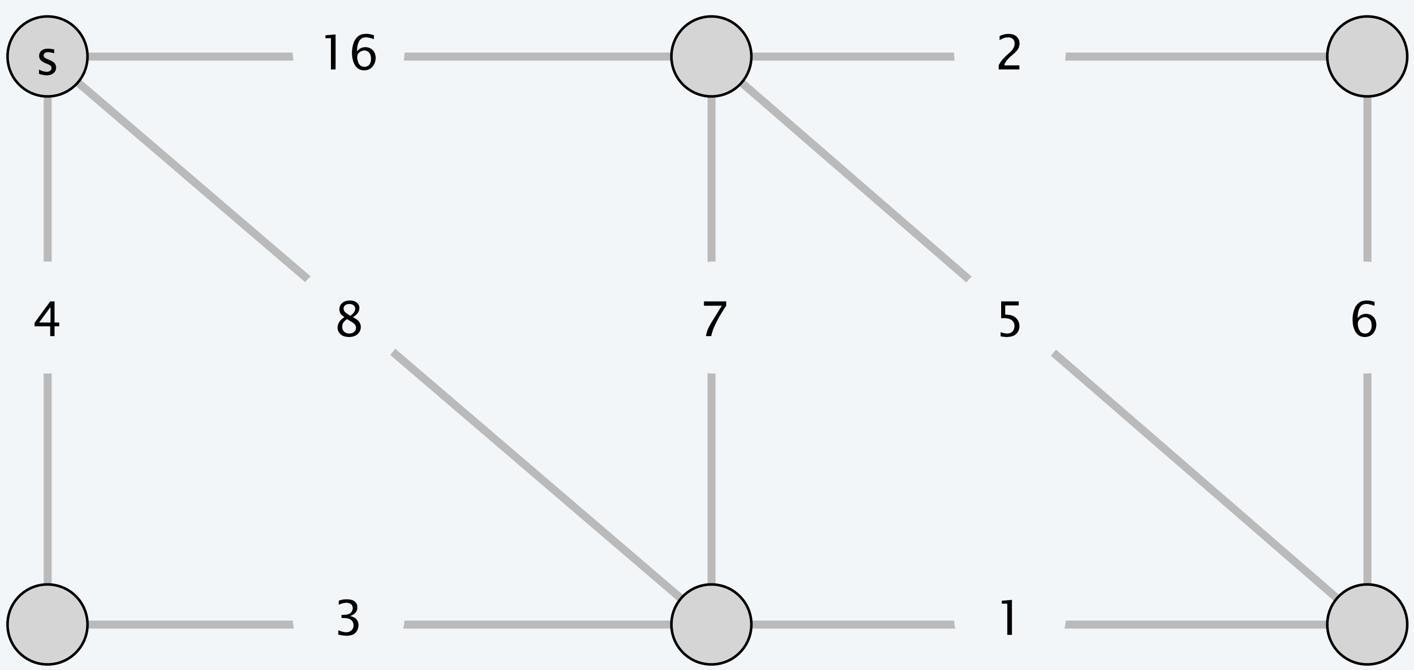


4. GREEDY ALGORITHMS II

- *Dijkstra's algorithm demo*
- *improved Dijkstra's algorithm demo*

Improved Dijkstra's algorithm demo

- Initialize $\pi(s) = 0$.
- Repeatedly choose $u \notin S$ with minimum $\pi(v)$.
  - for each edge (u, v) leaving u, set $\pi(v) = \min \{ \pi(v), \pi(u) + \ell(u, v) \}$
  - add u to S



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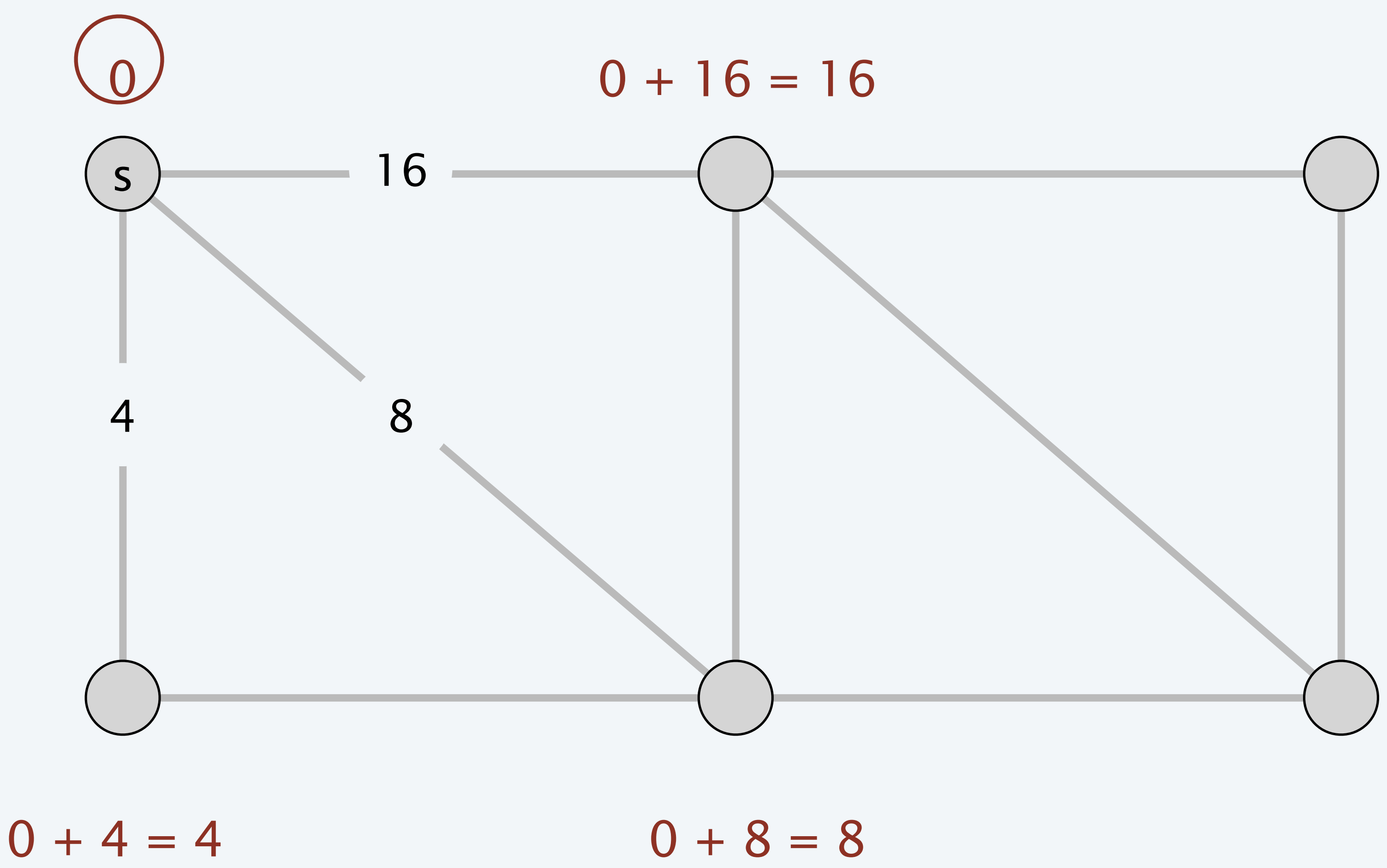

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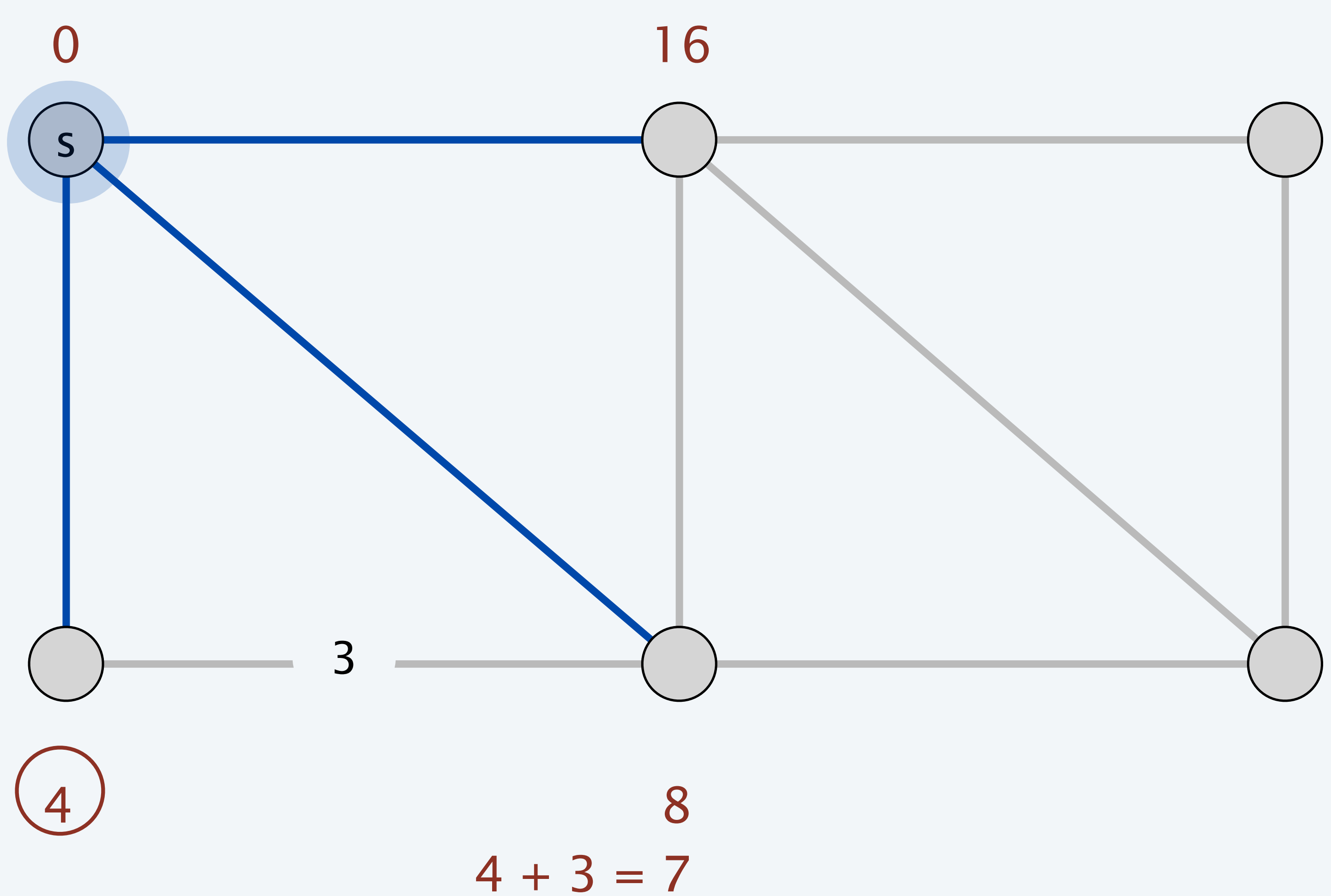

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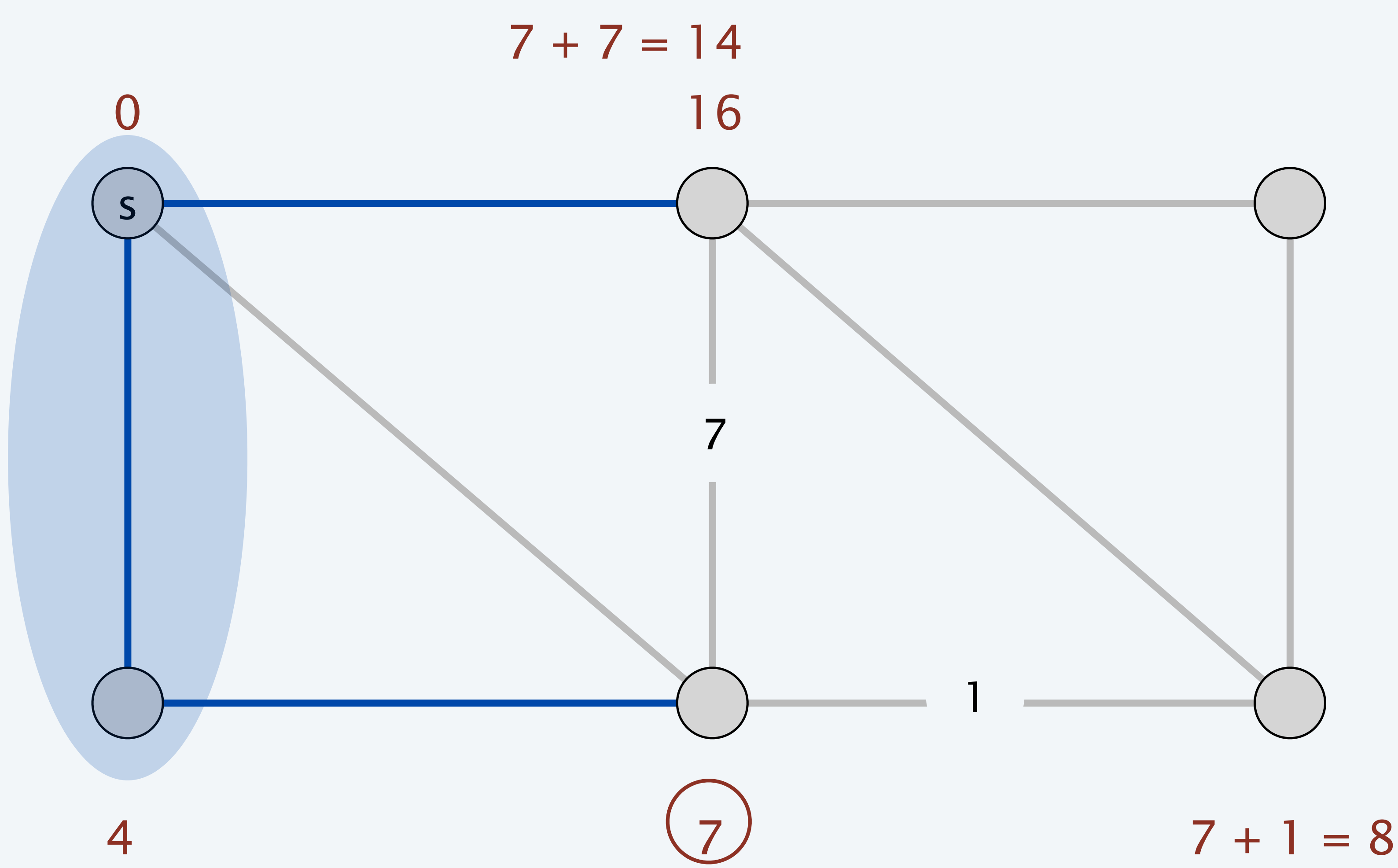

Improved Dijkstra's algorithm demo

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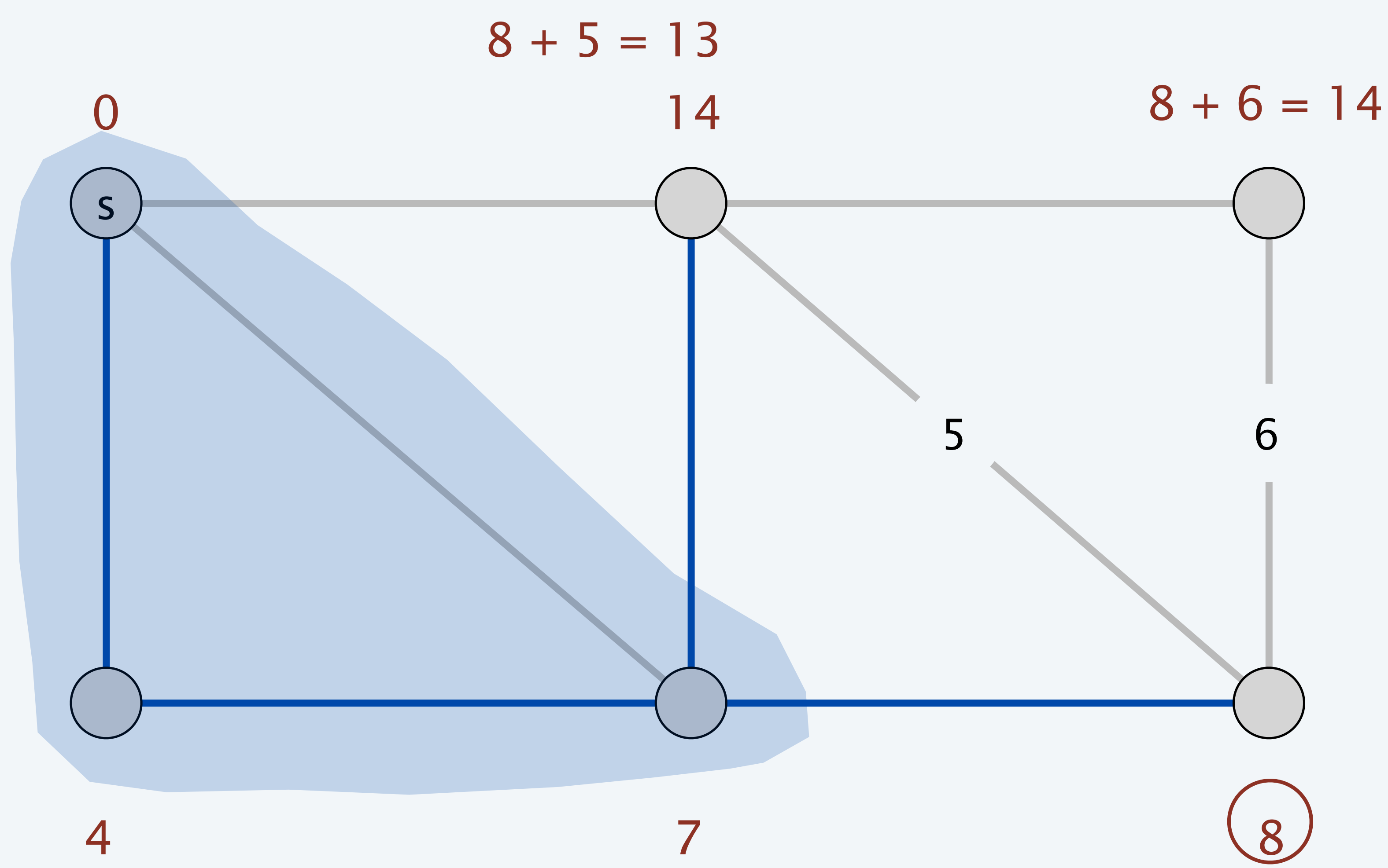

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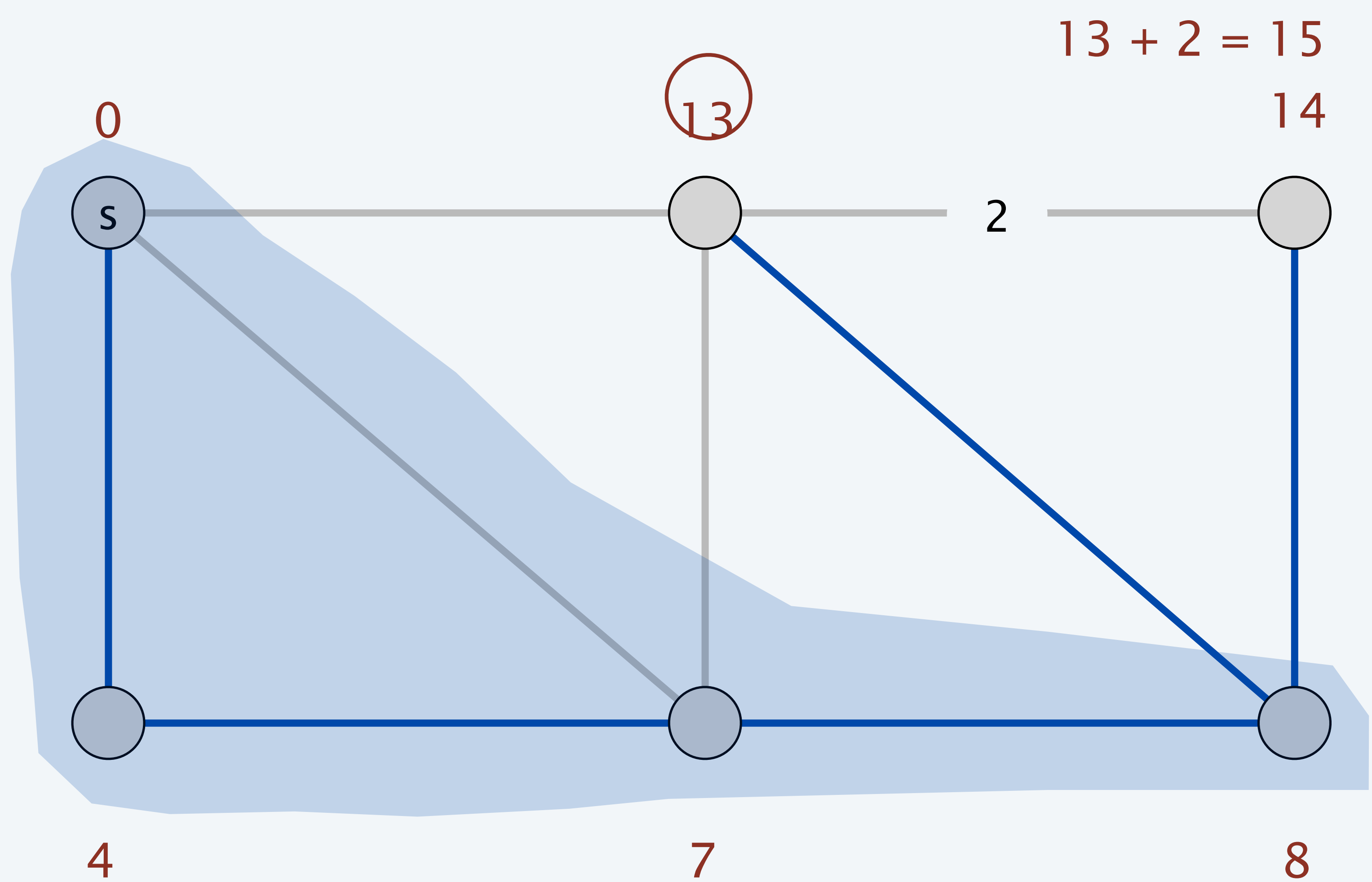

Improved Dijkstra's algorithm demo

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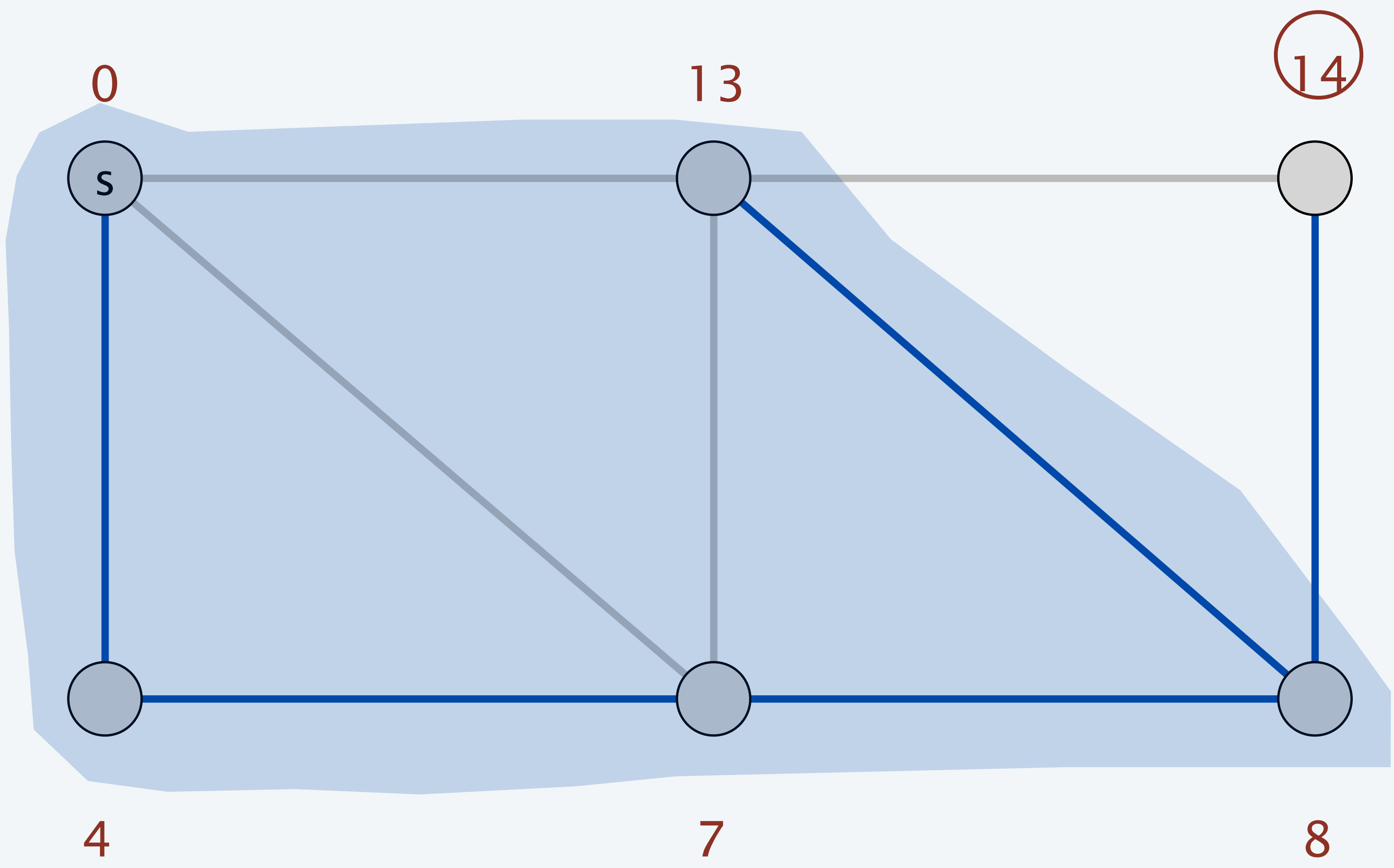

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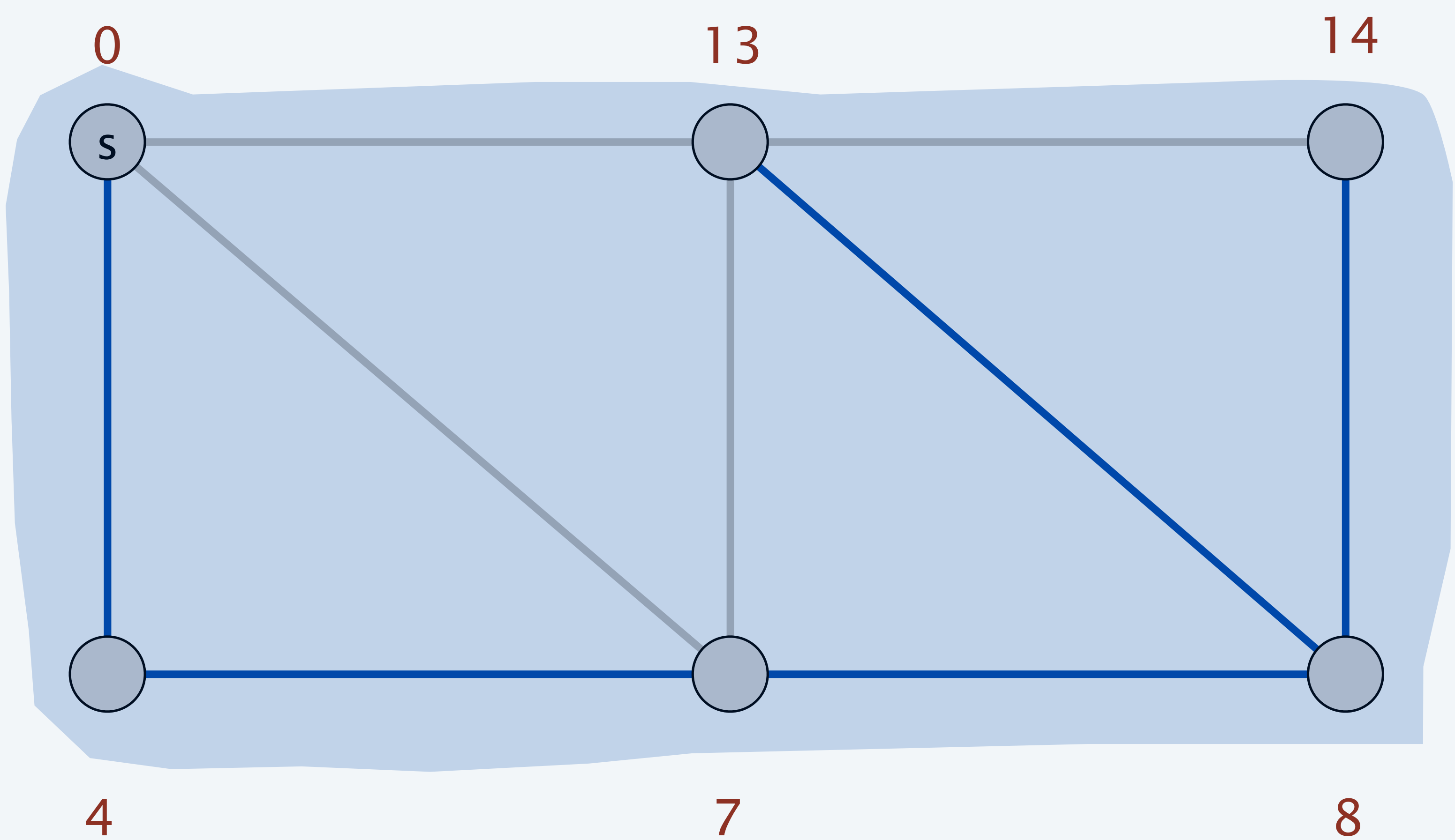

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