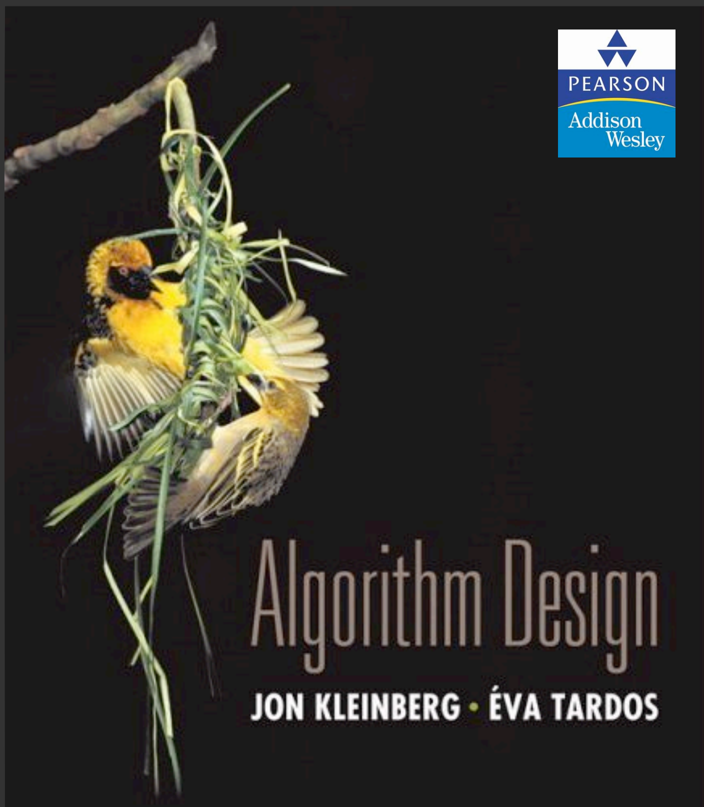


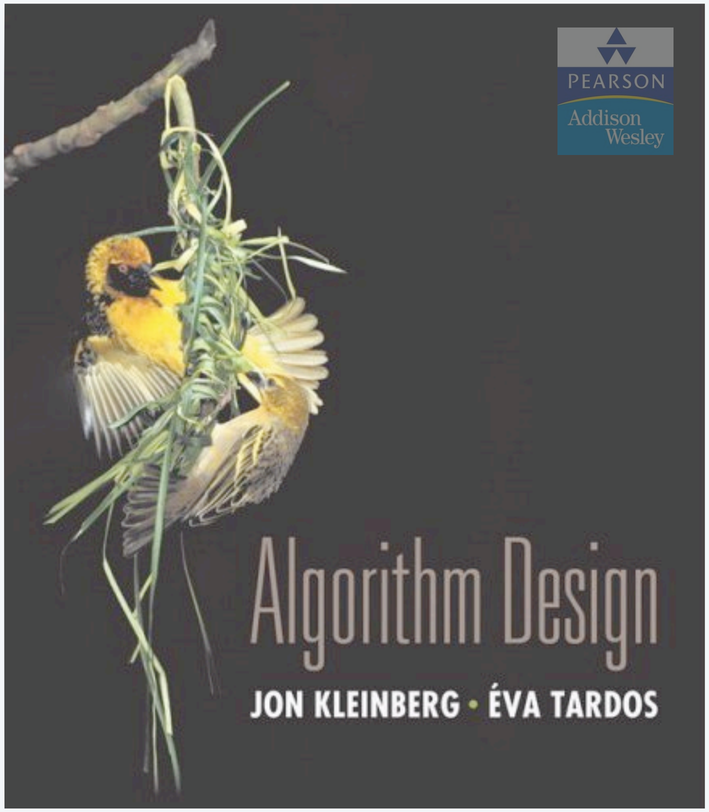

# 4. Greedy Algorithms (Part II)

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

Lecture slides by Kevin Wayne

http://www.cs.princeton.edu/~wayne/kleinberg-tardos

Last updated on Feb 12, 2013 8:02 PM




SECTION 4.4

# 4. GREEDY ALGORITHMS (PART II)

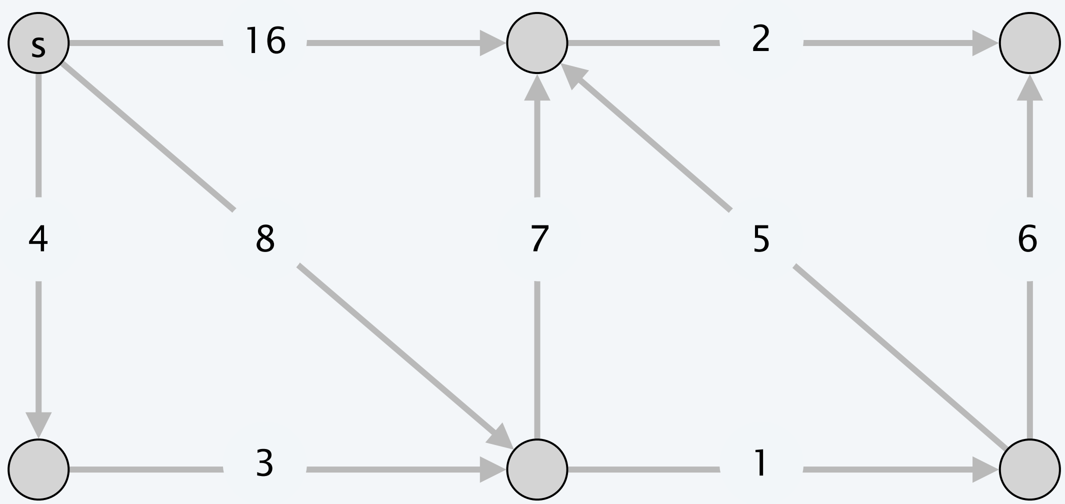
- *Dijkstra's algorithm demo*
- *improved Dijkstra's algorithm demo*

# 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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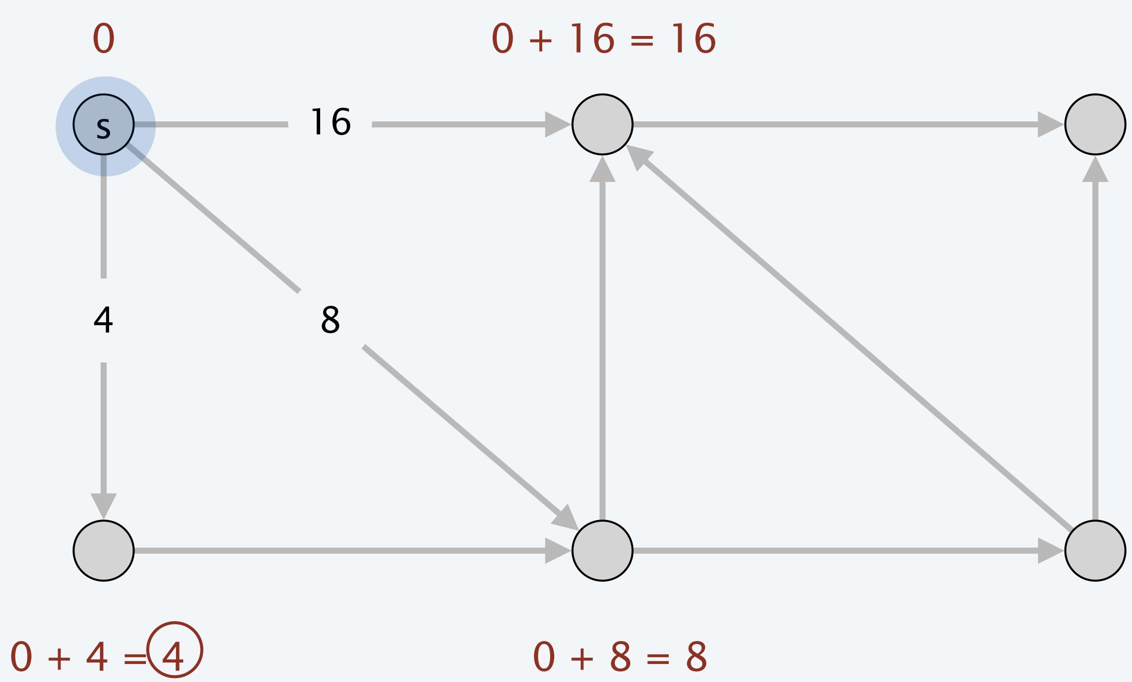

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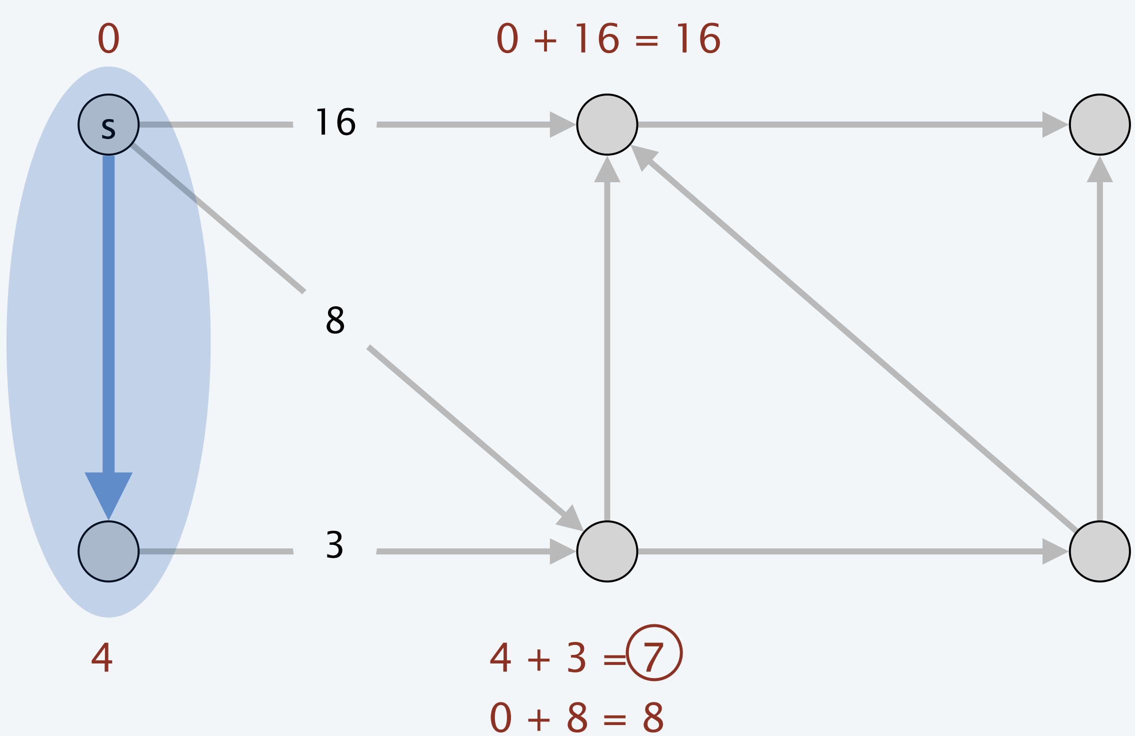

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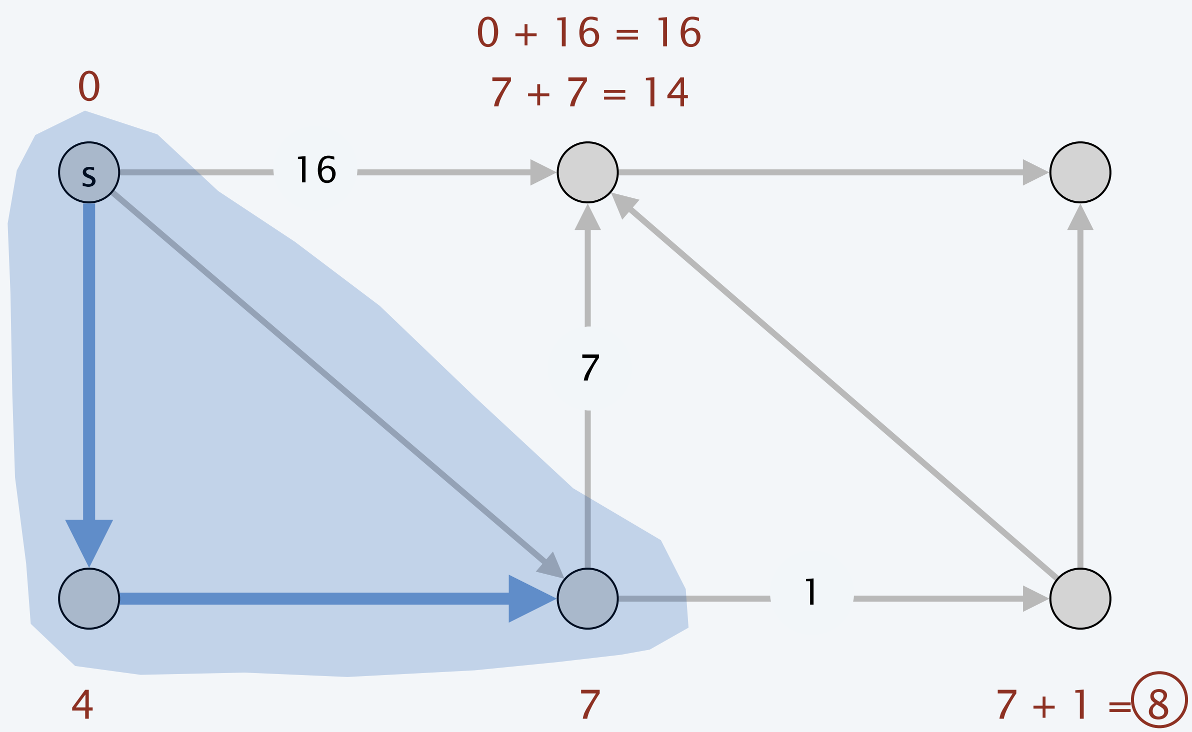

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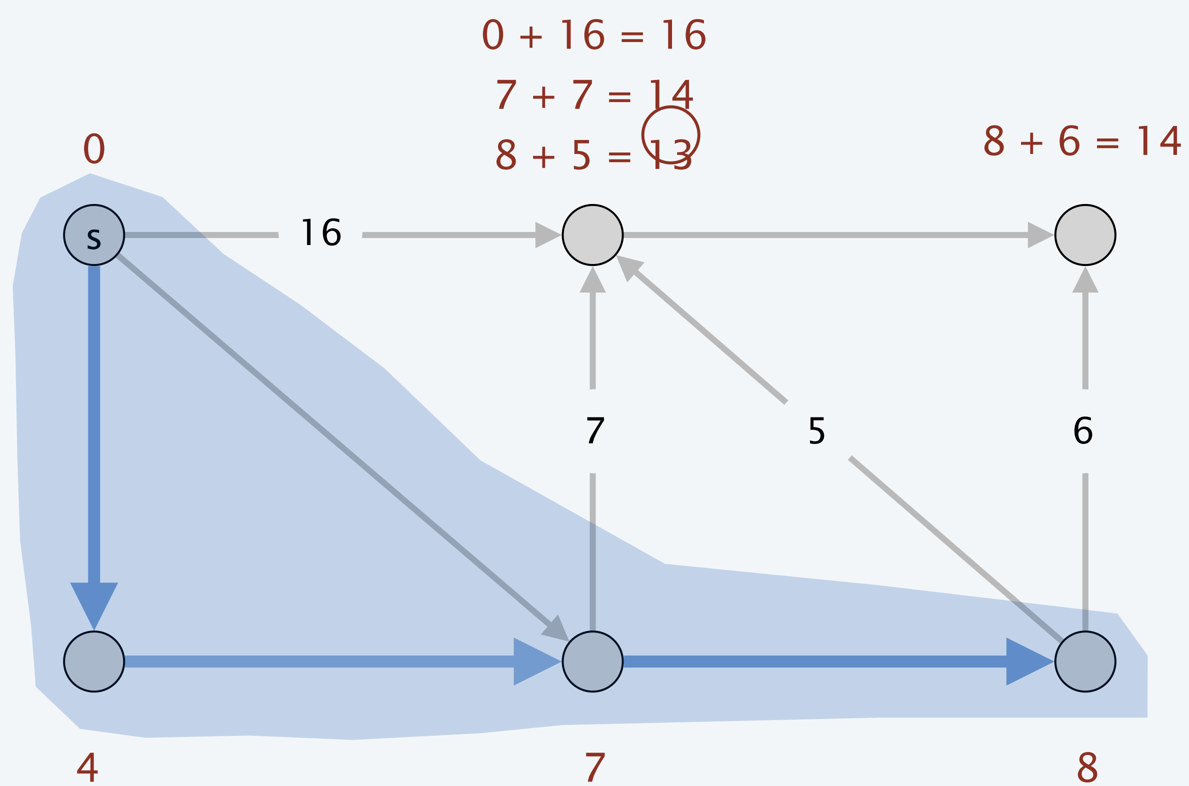

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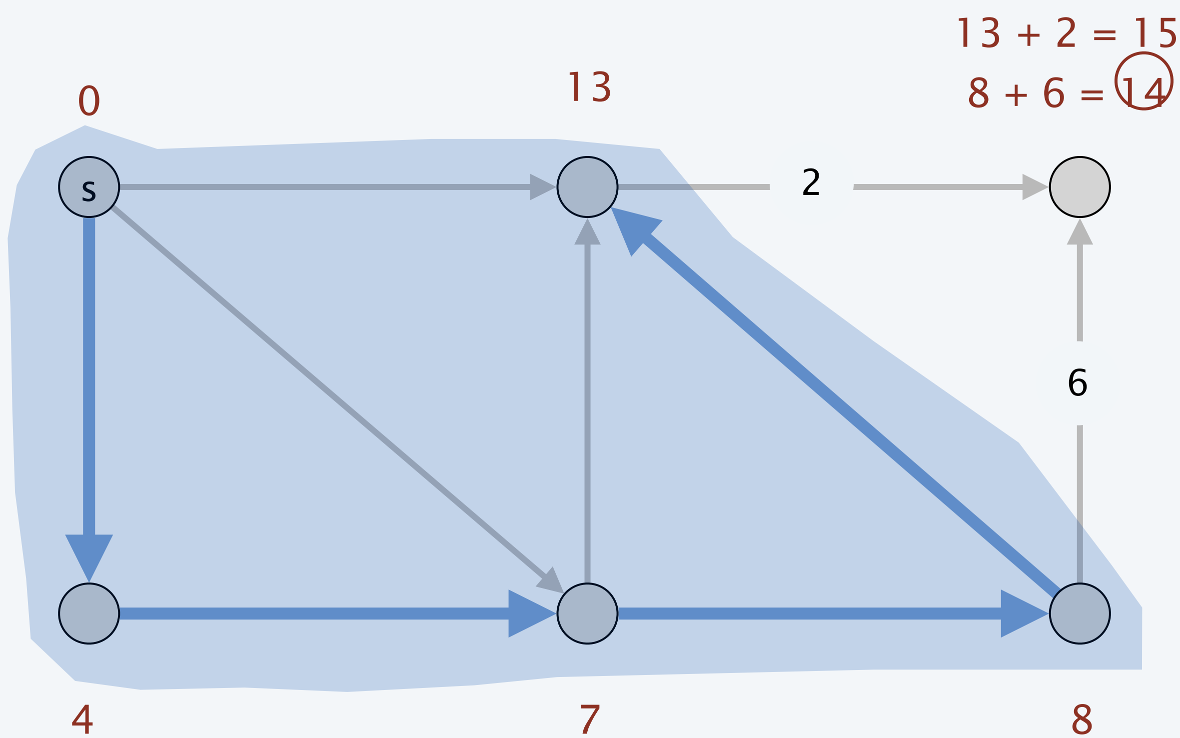

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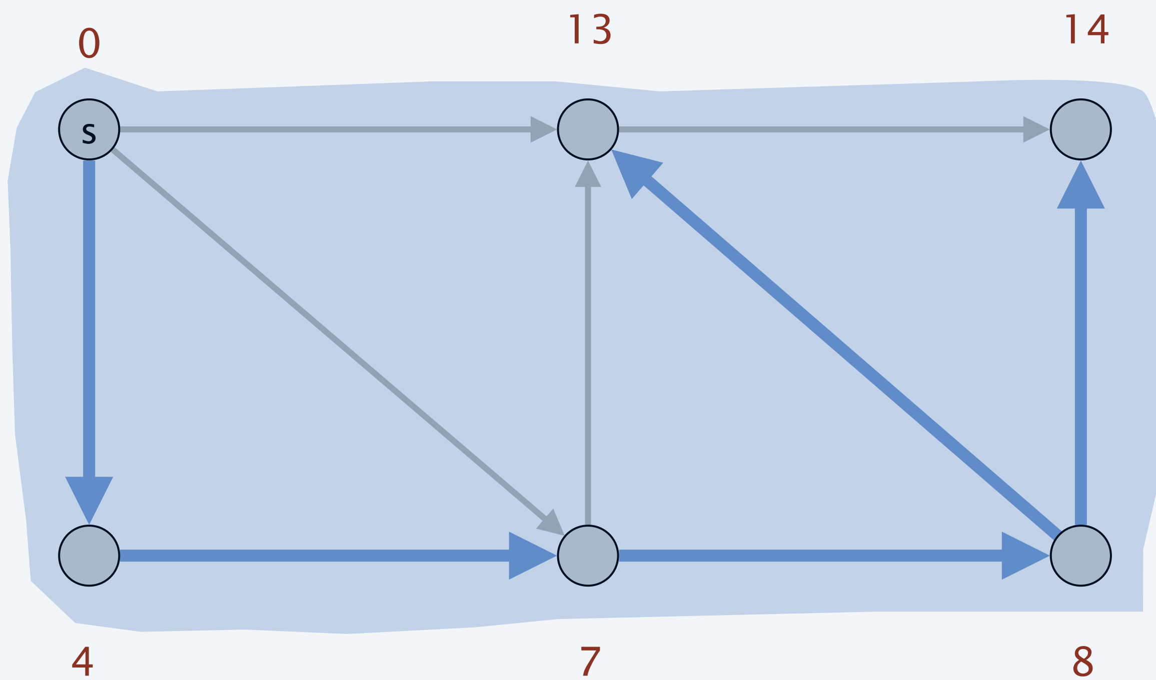

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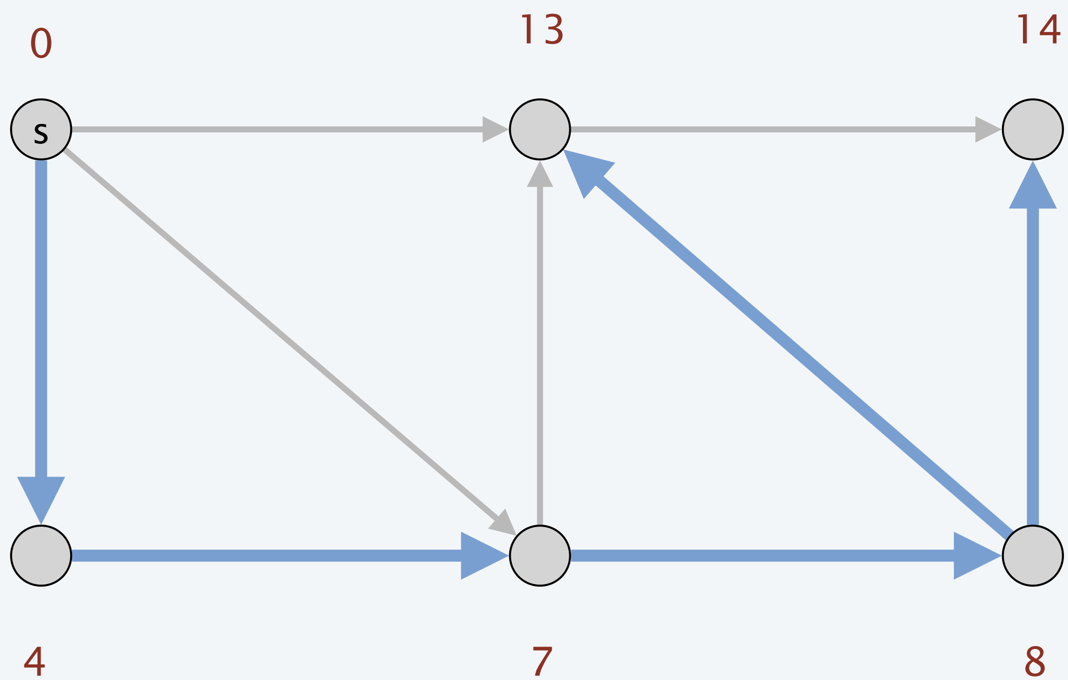
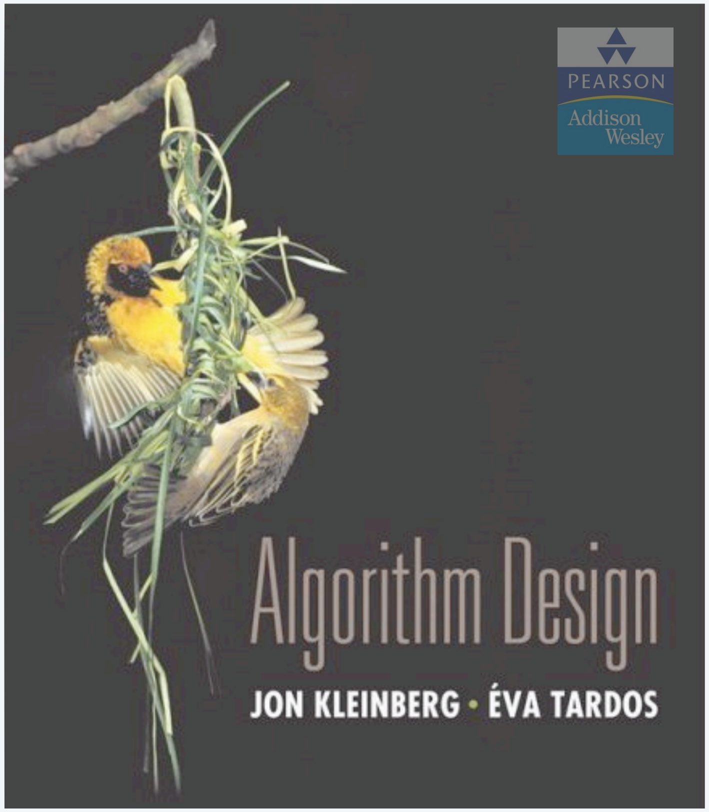




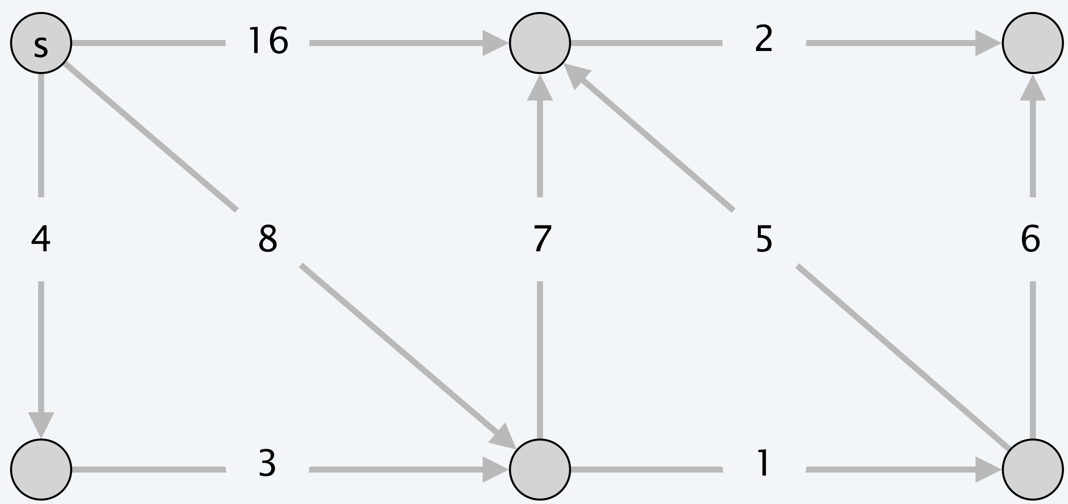

SECTION 4.4

# 4. GREEDY ALGORITHMS (PART 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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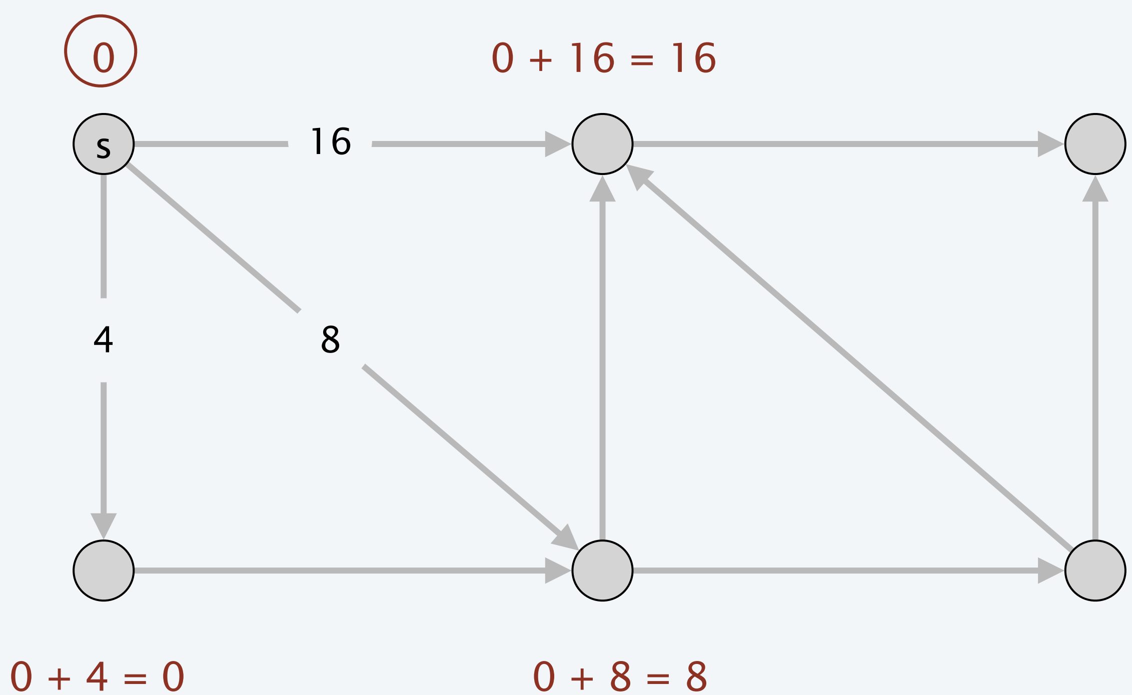

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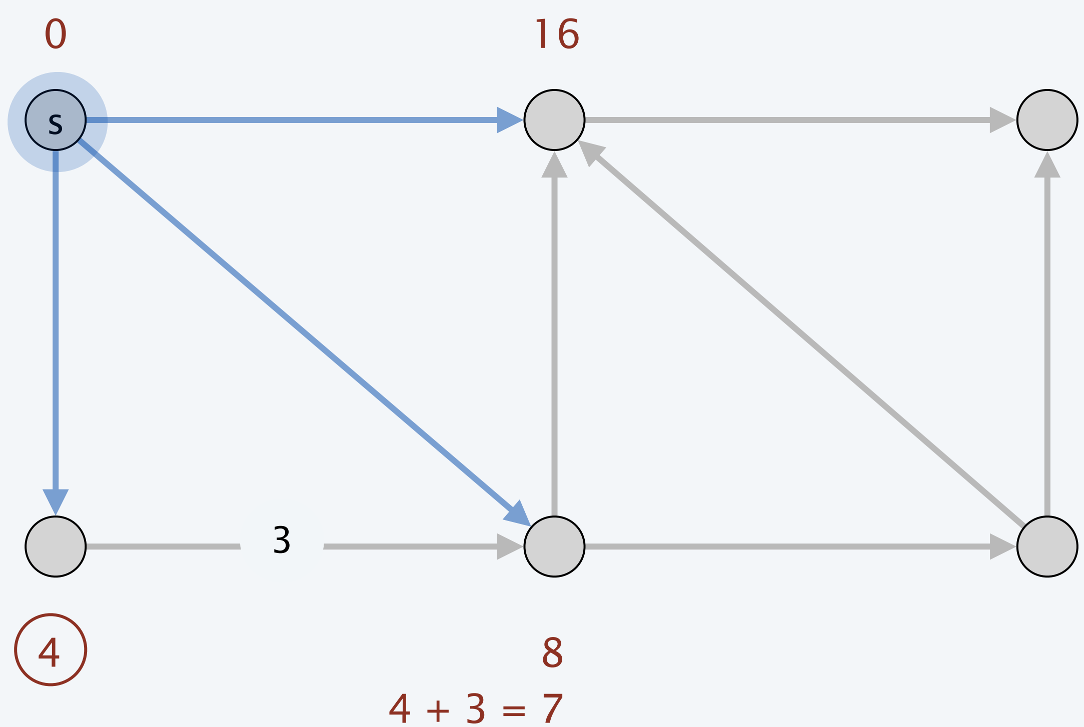

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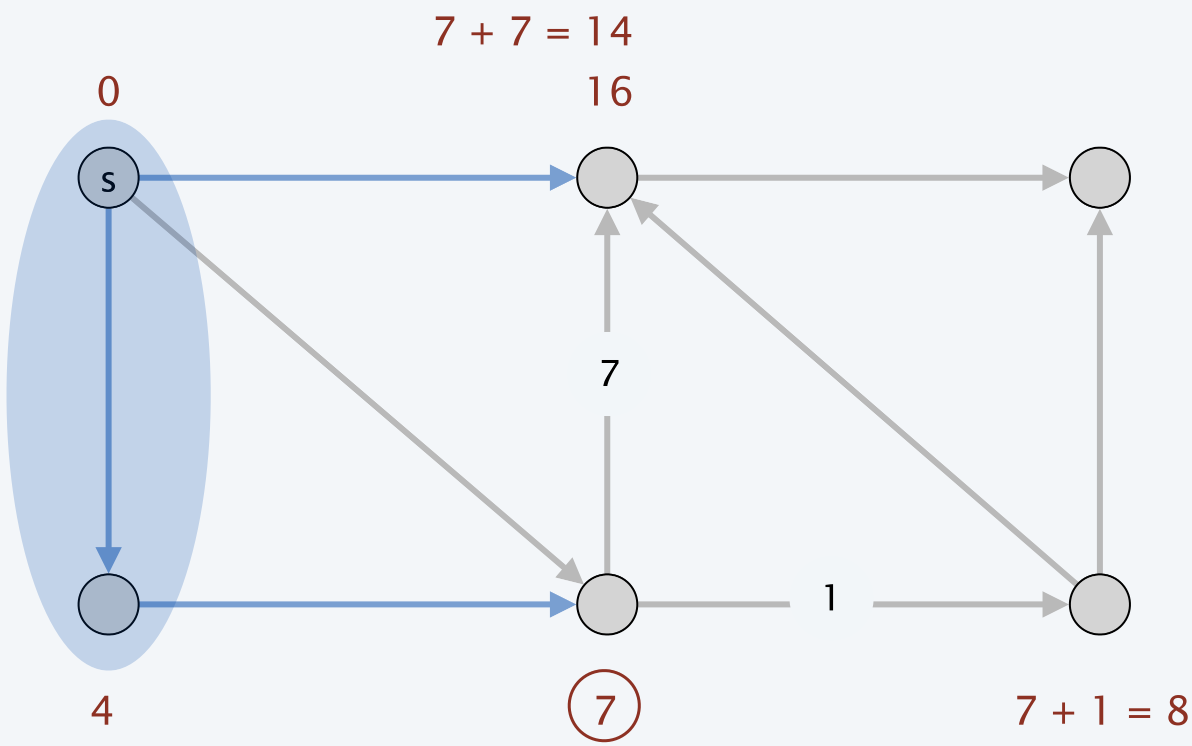

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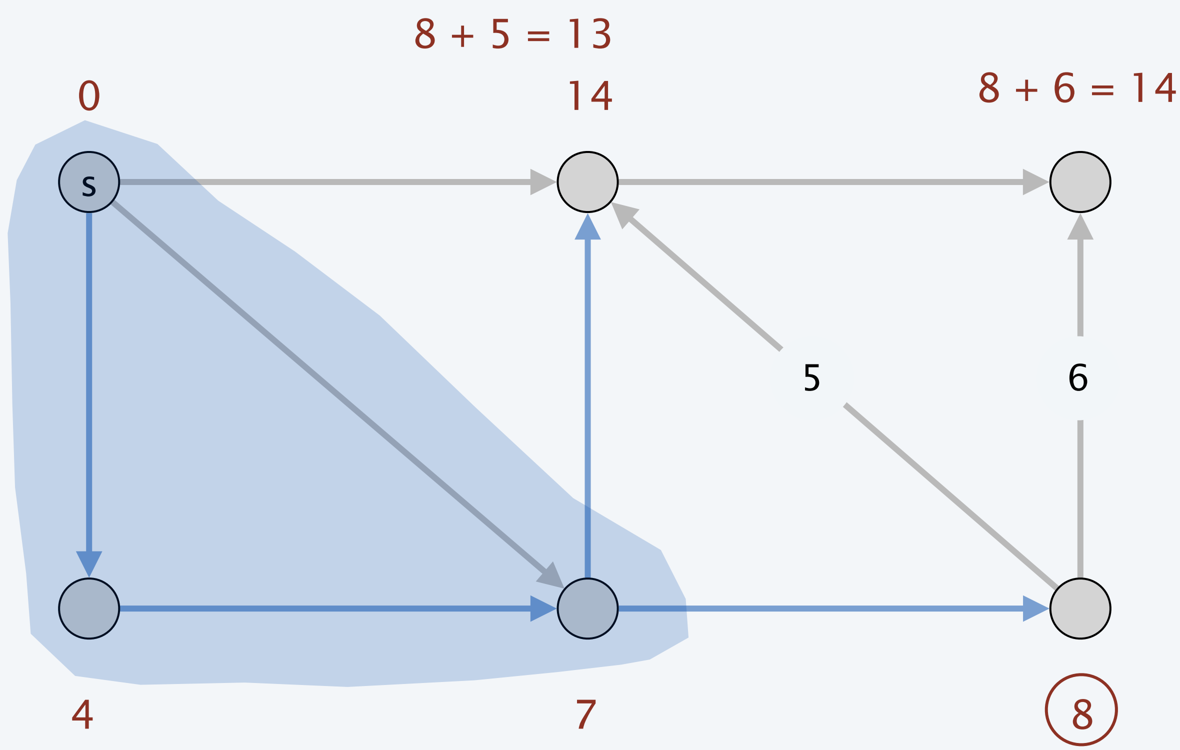

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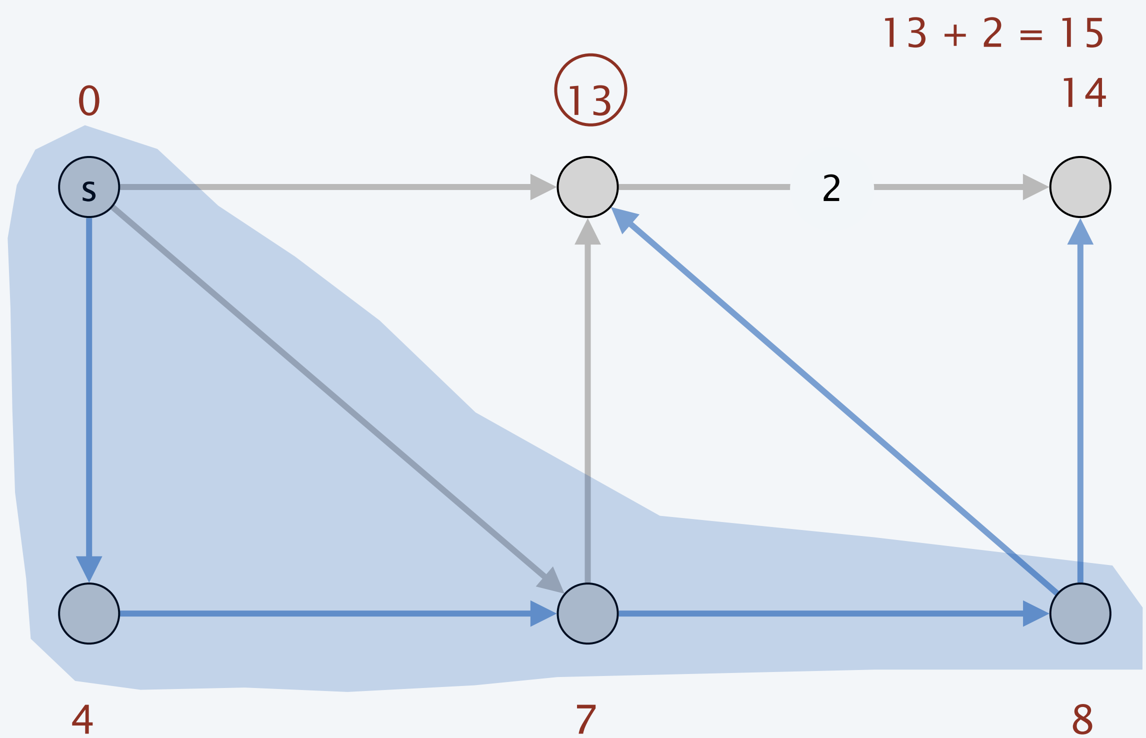

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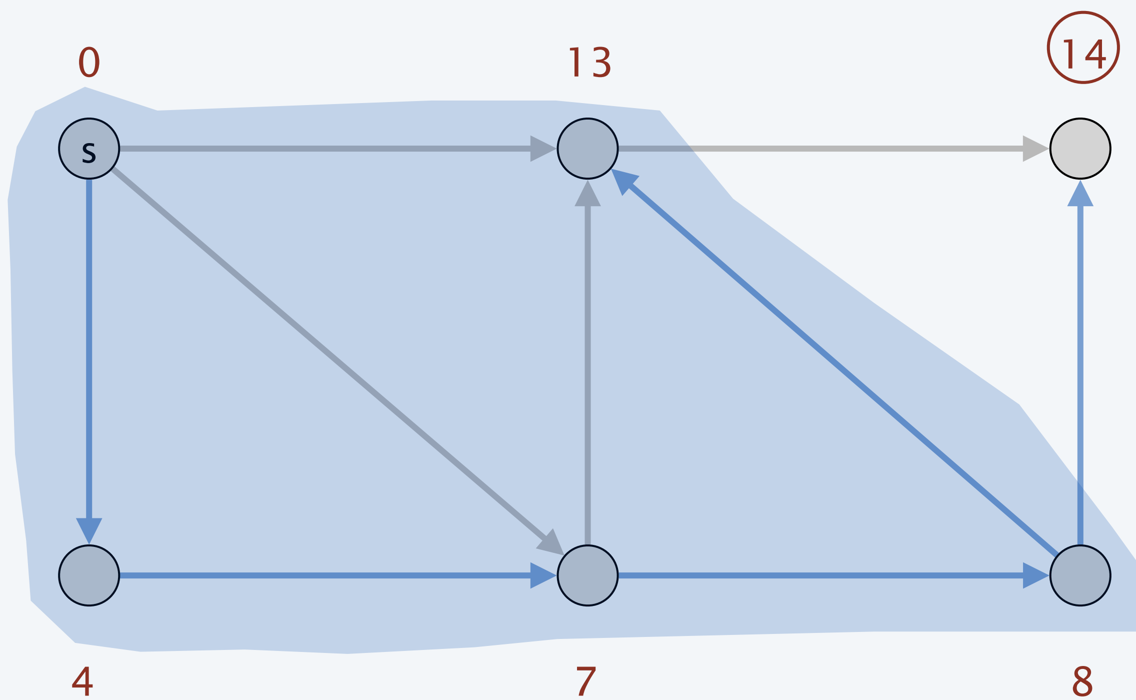

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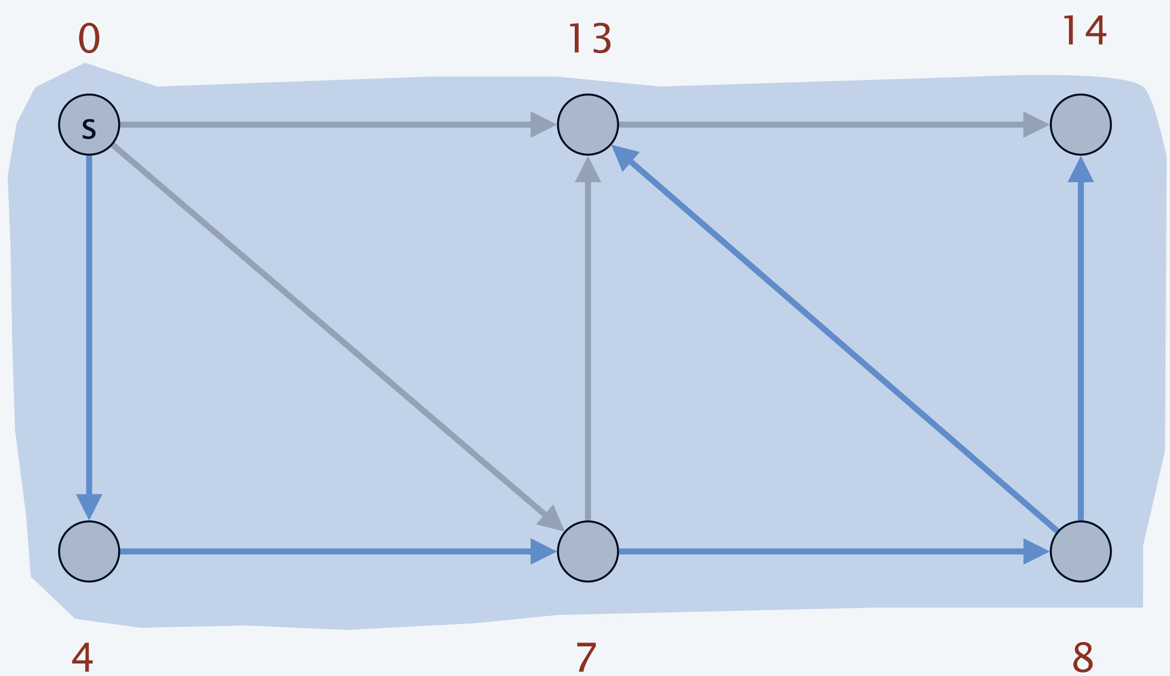

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