4. GREEDY ALGORITHMS II

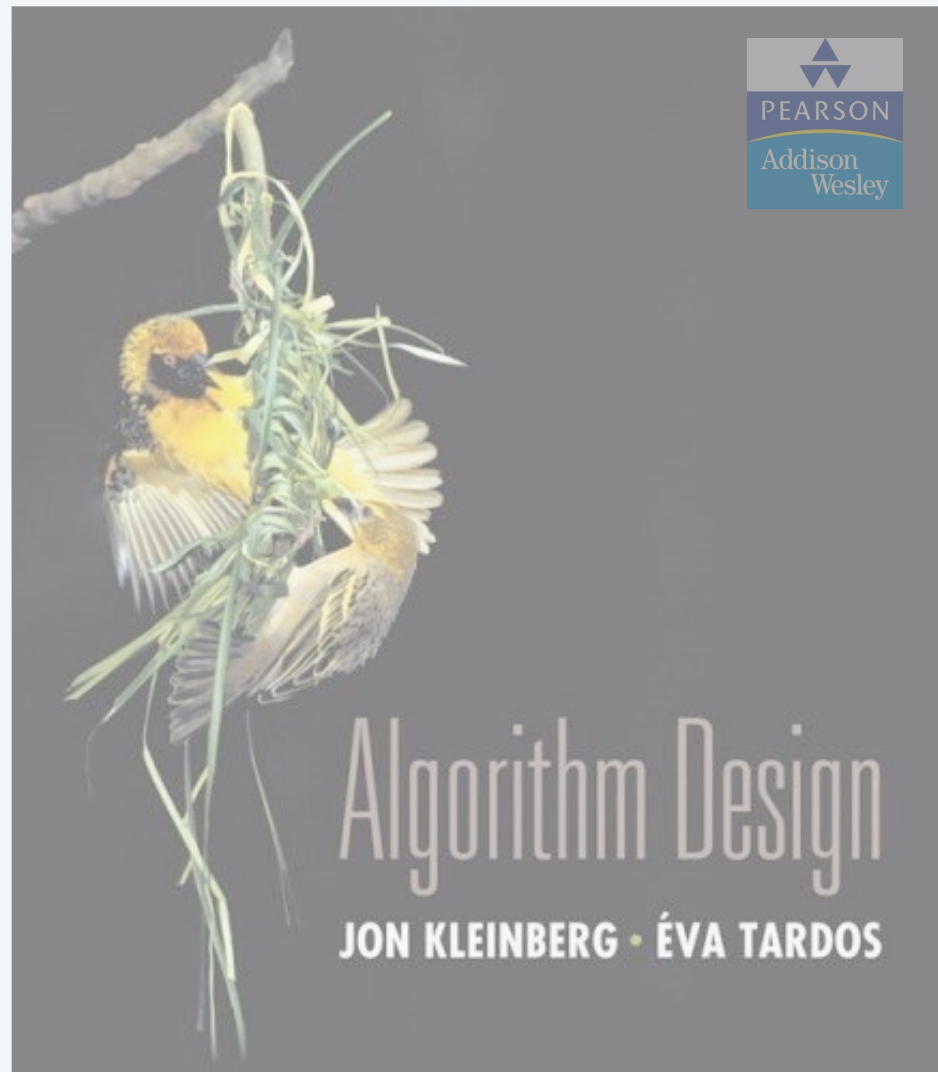▸ *Dijkstra's algorithm demo*

▸ *improved Dijkstra's algorithm demo*

4. GREEDY ALGORITHMS II

‣ *Dijkstra's algorithm demo*

‣ *improved Dijkstra's algorithm demo*

Dijkstra's algorithm demo

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

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

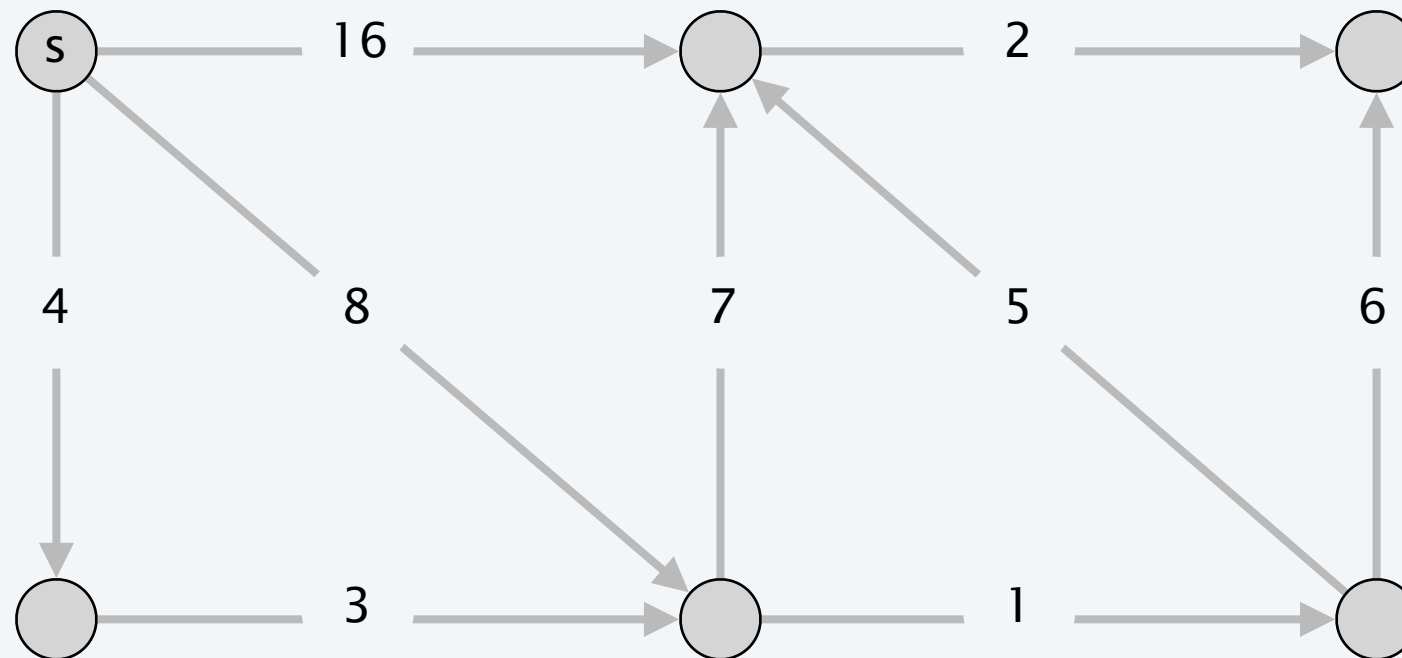add v to S; set $d(v) = \pi(v)$.

Dijkstra's algorithm demo

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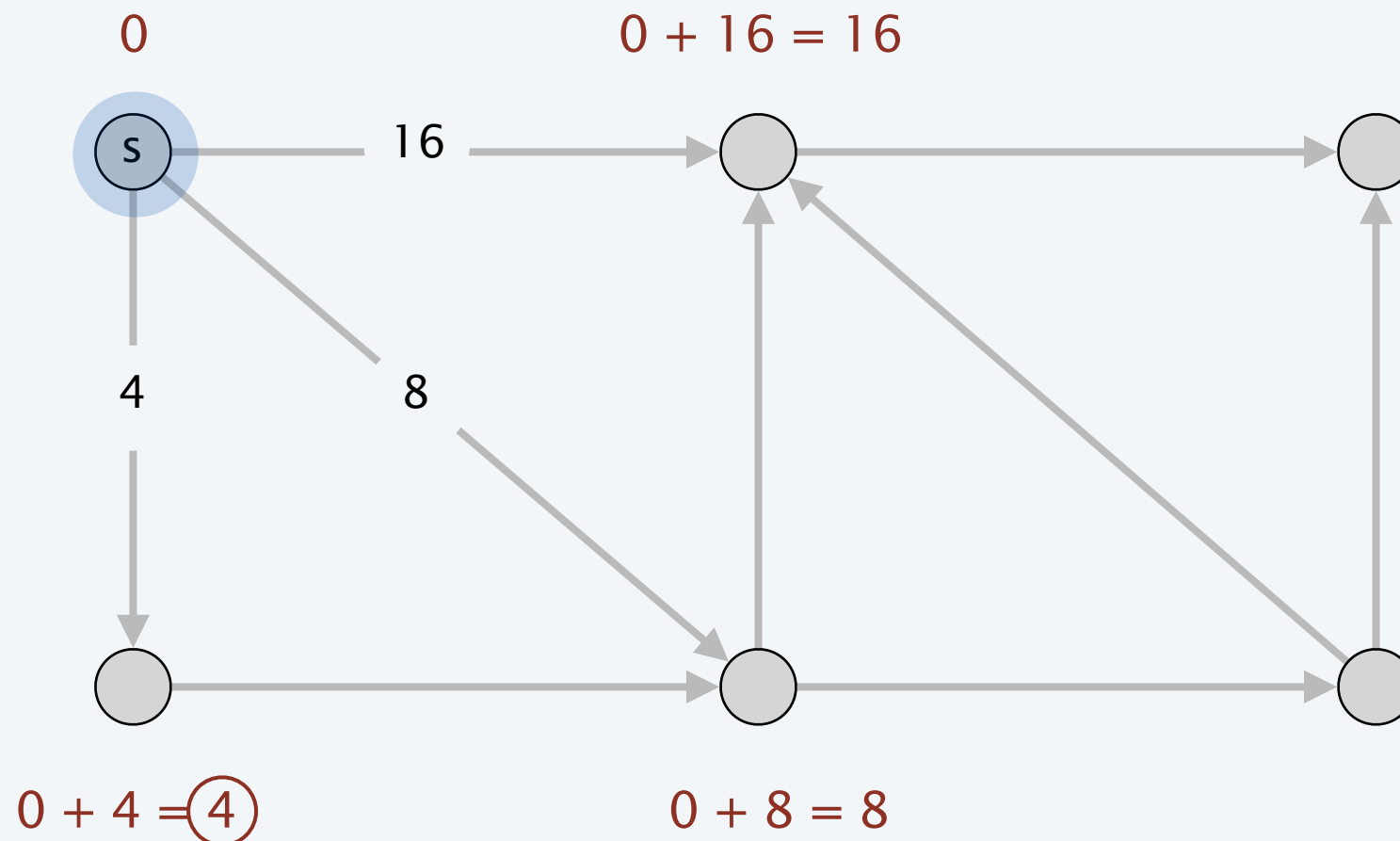
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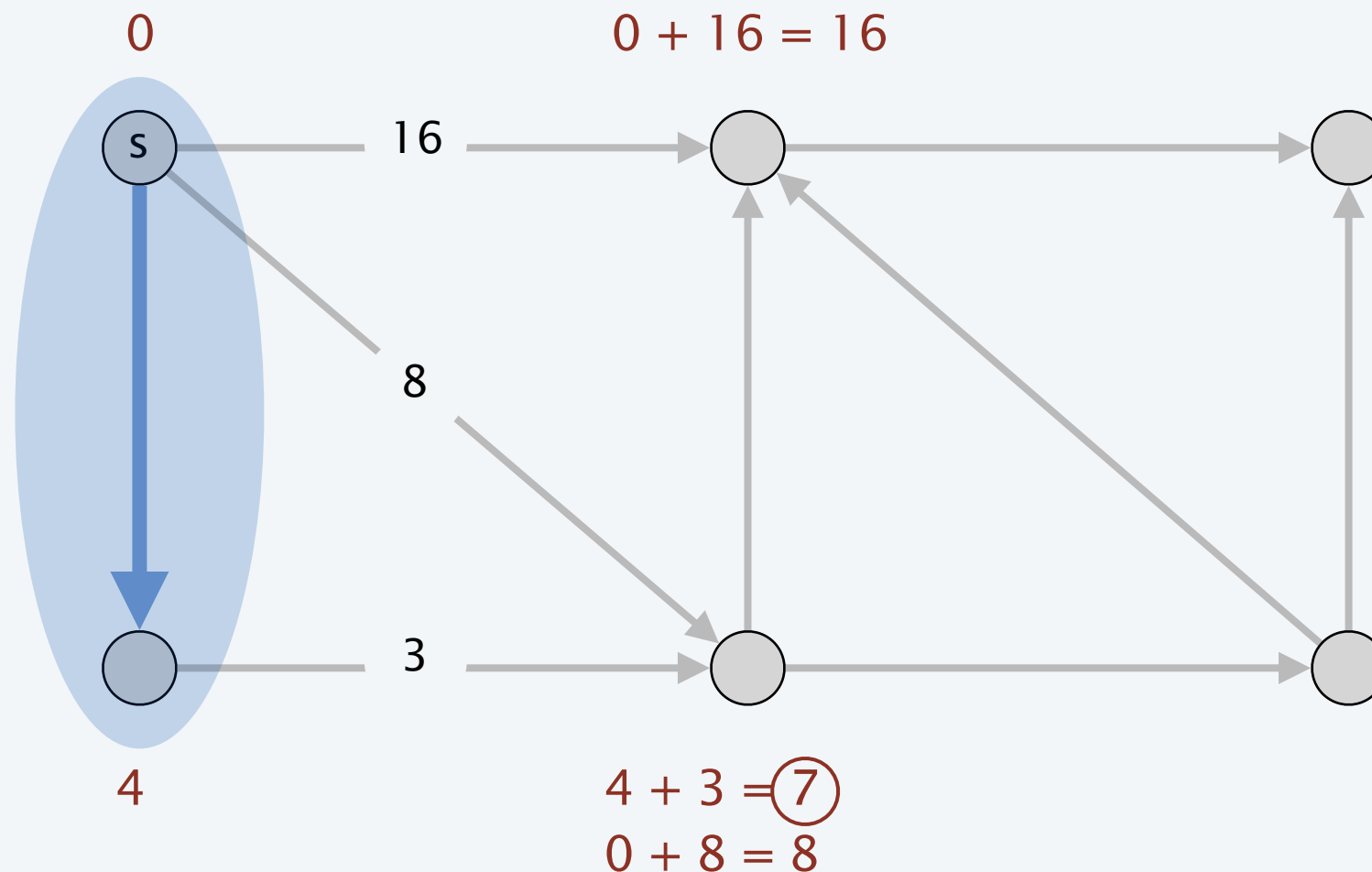
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Dijkstra's algorithm demo

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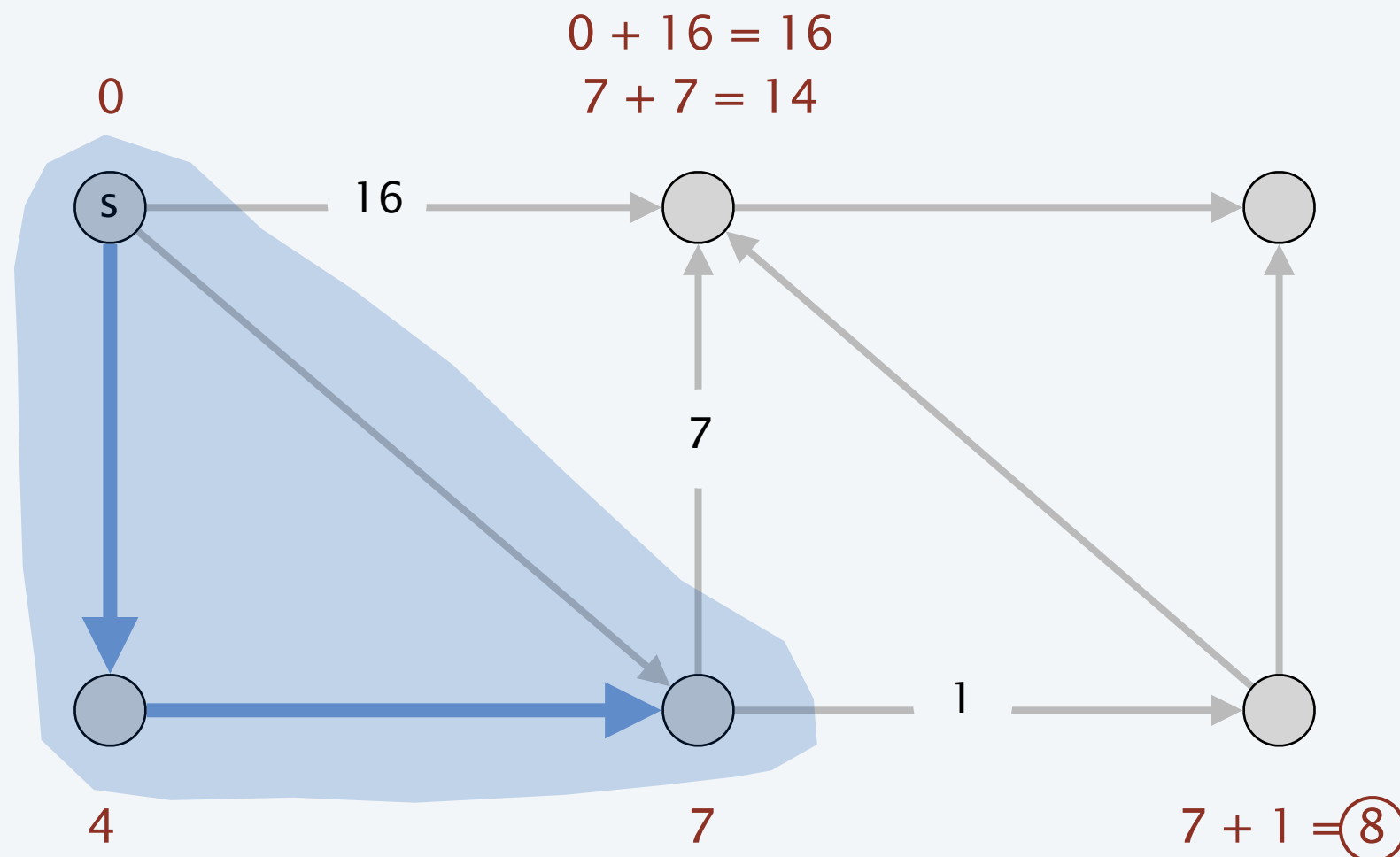
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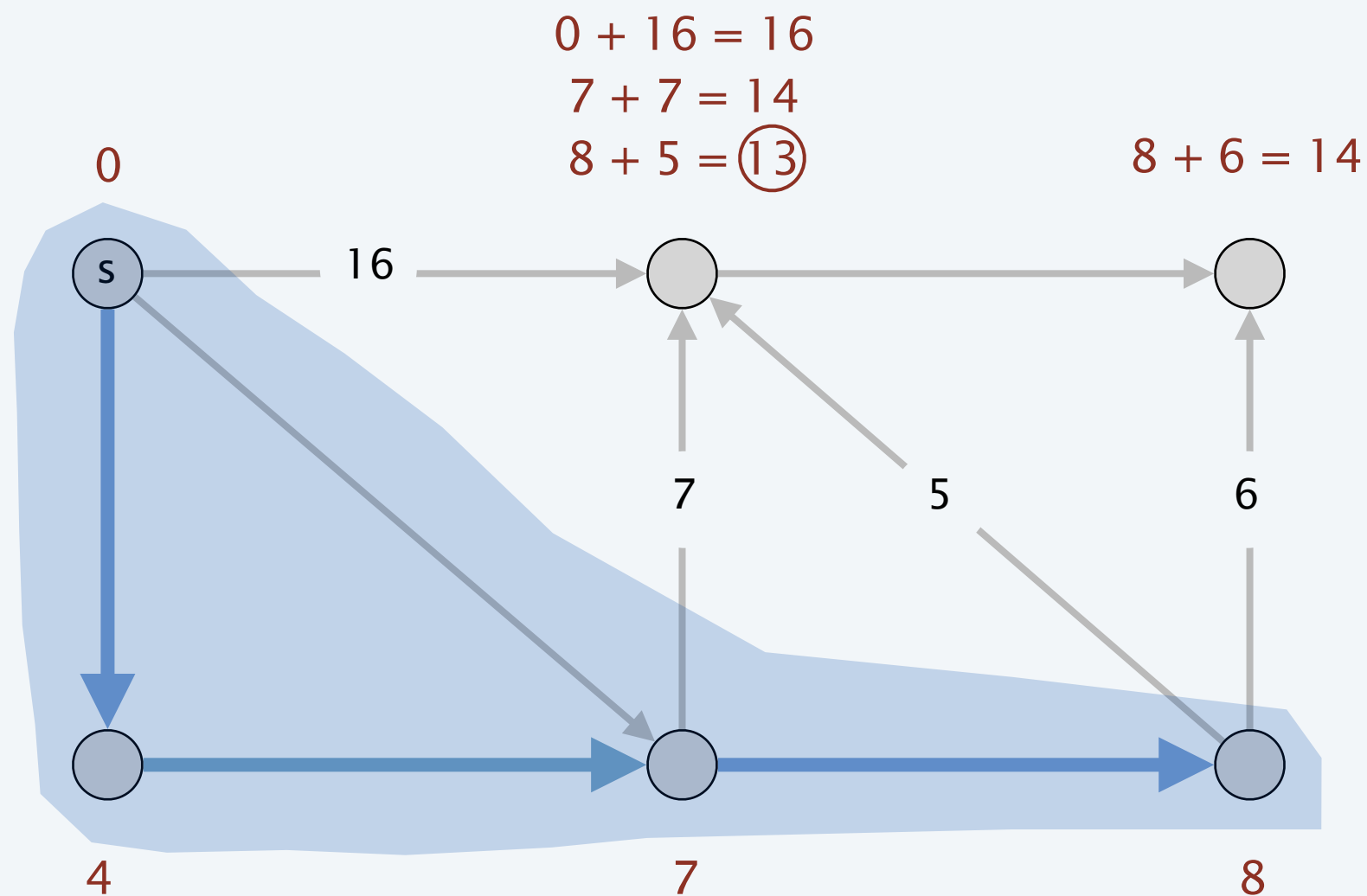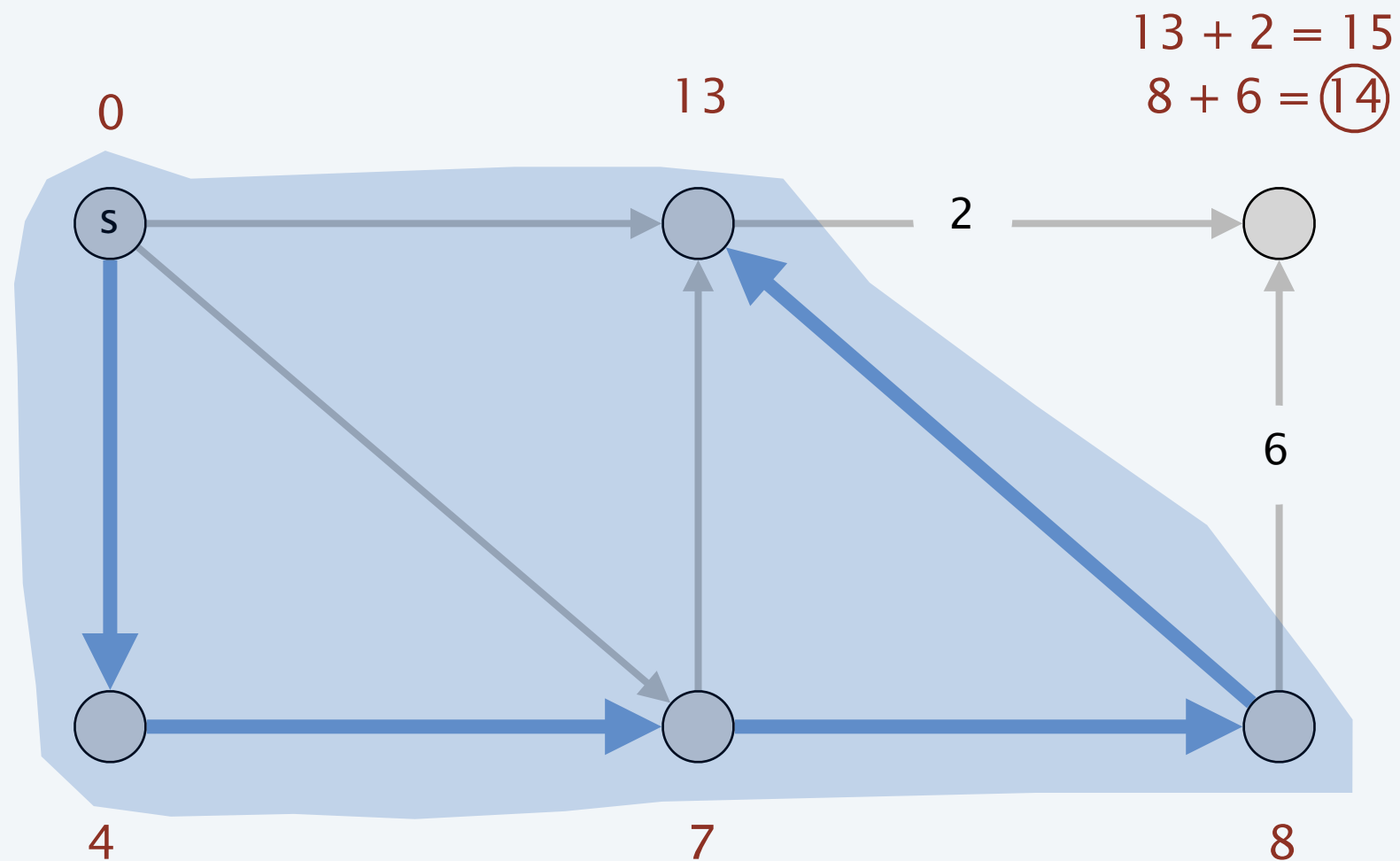13 + 2 = 15

8 + 6 = ⑭

0

13

2

s

6

4

7

8

Dijkstra's algorithm demo

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Dijkstra's algorithm demo

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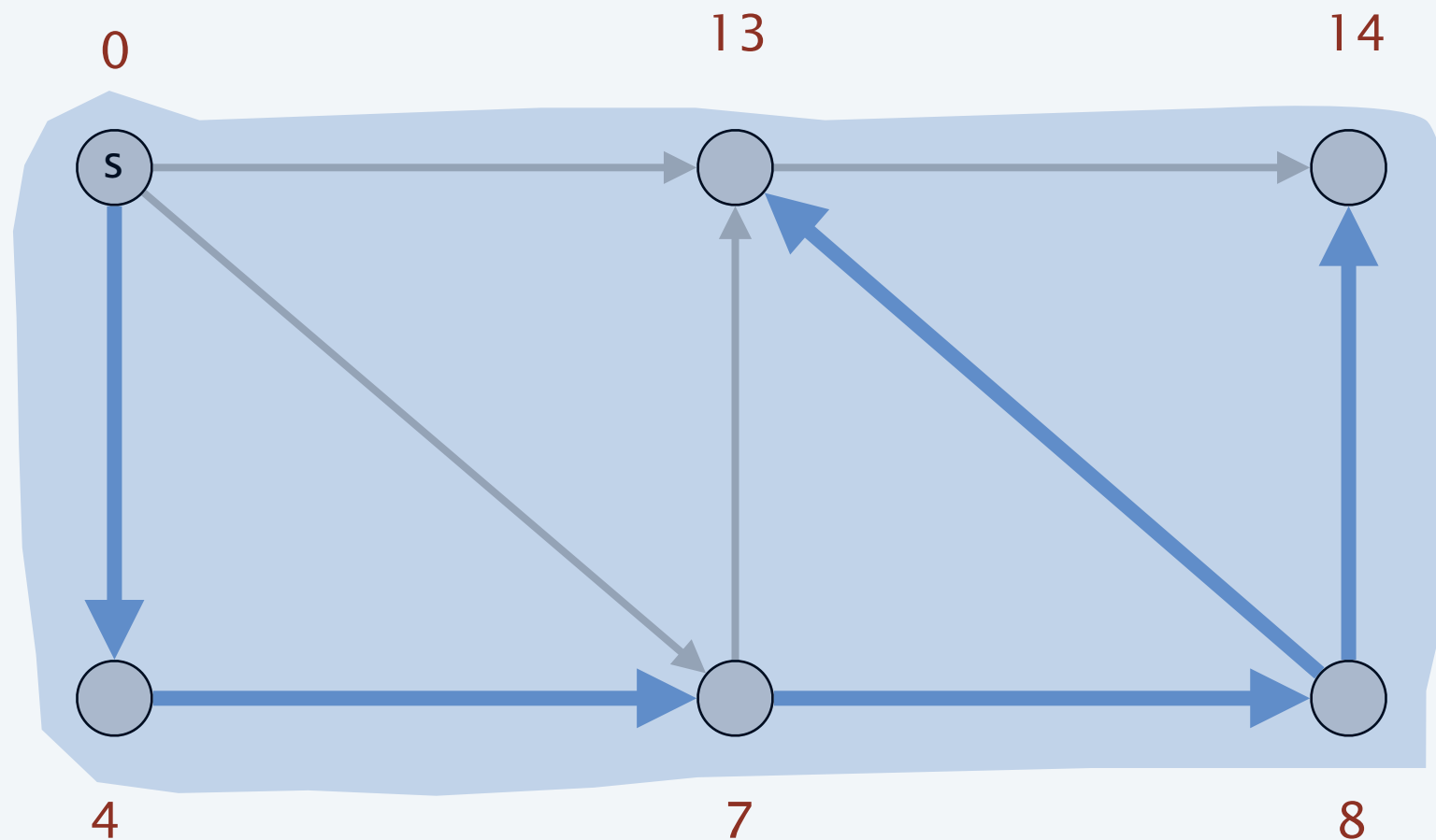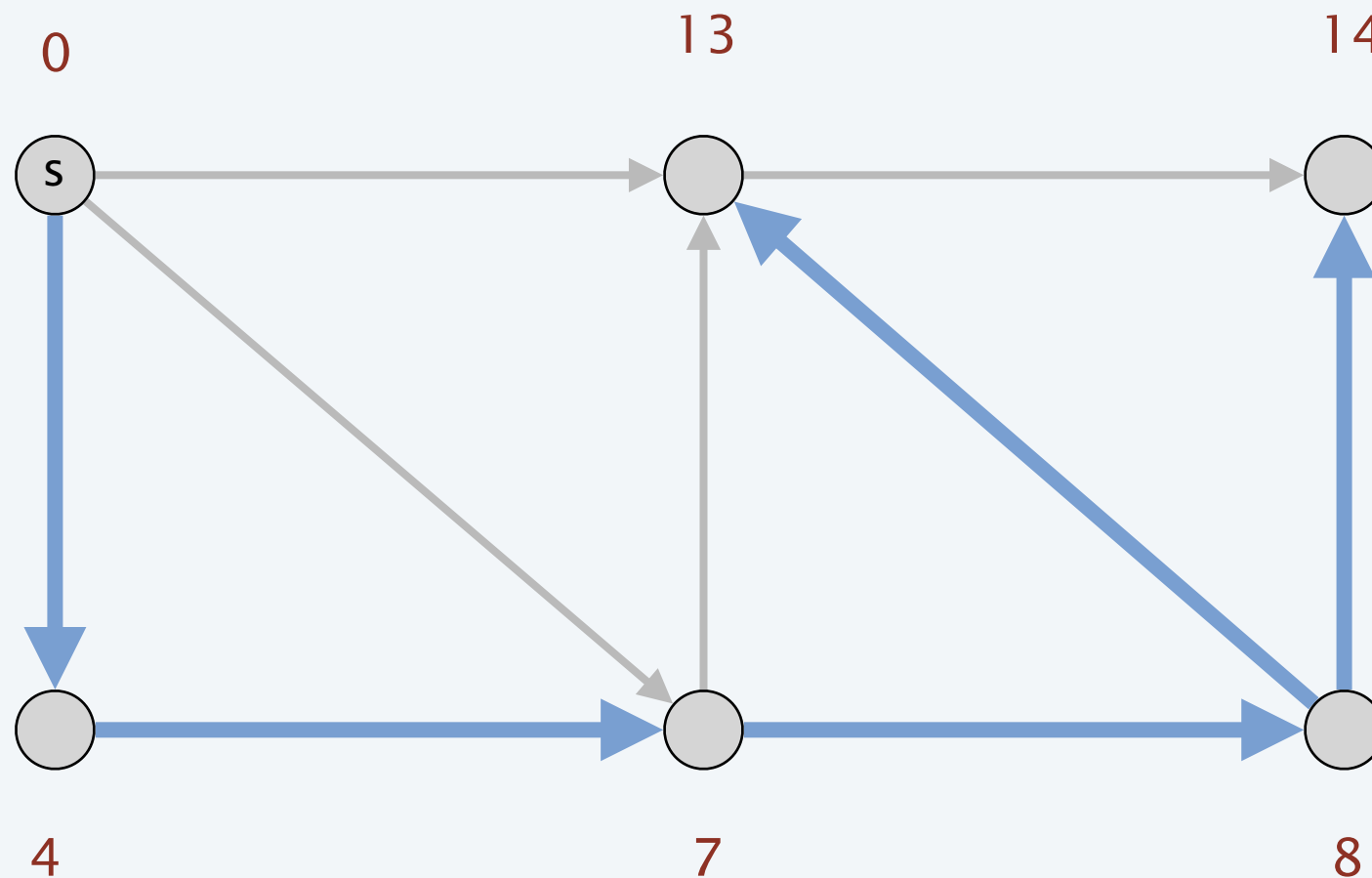
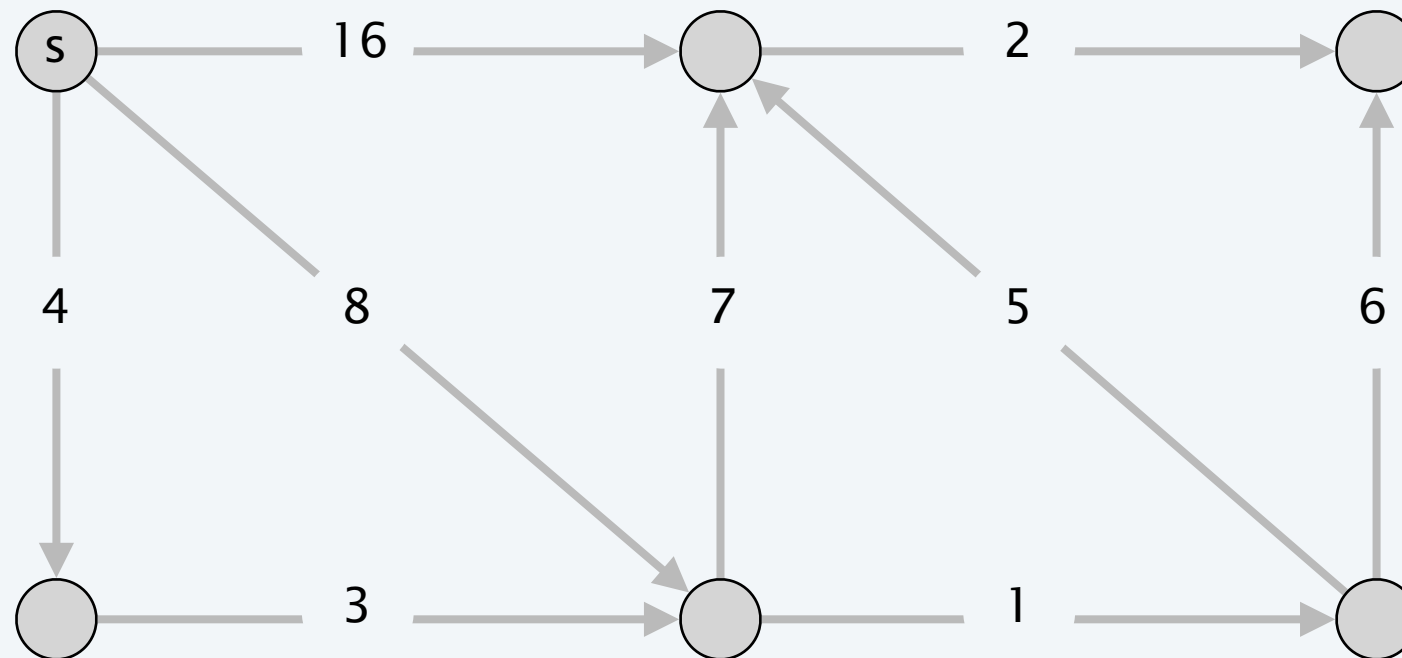add v to S; set $d(v) = \pi(v)$.

4. Greedy Algorithms II

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

Improved Dijkstra's algorithm demo

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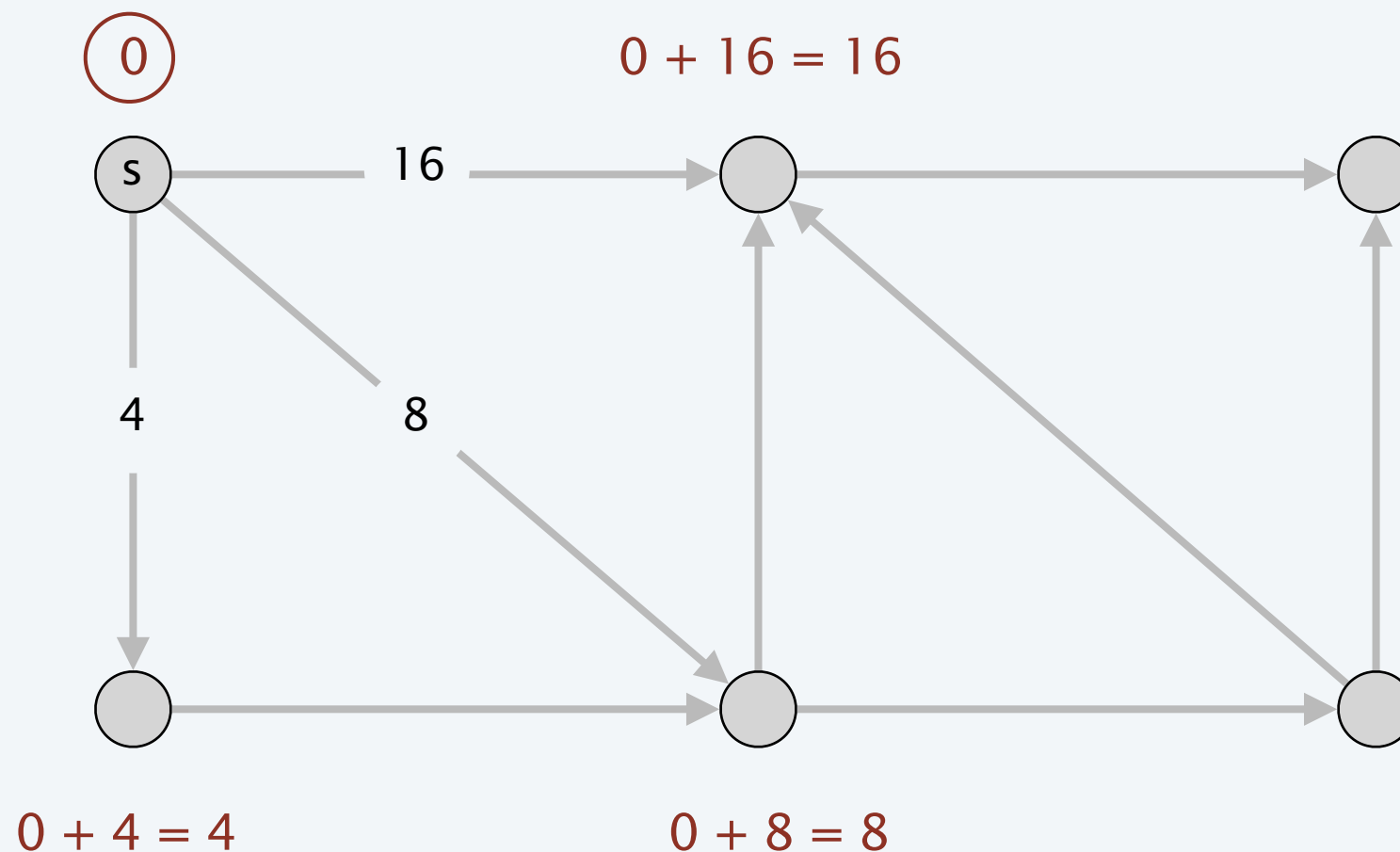 - add u to S

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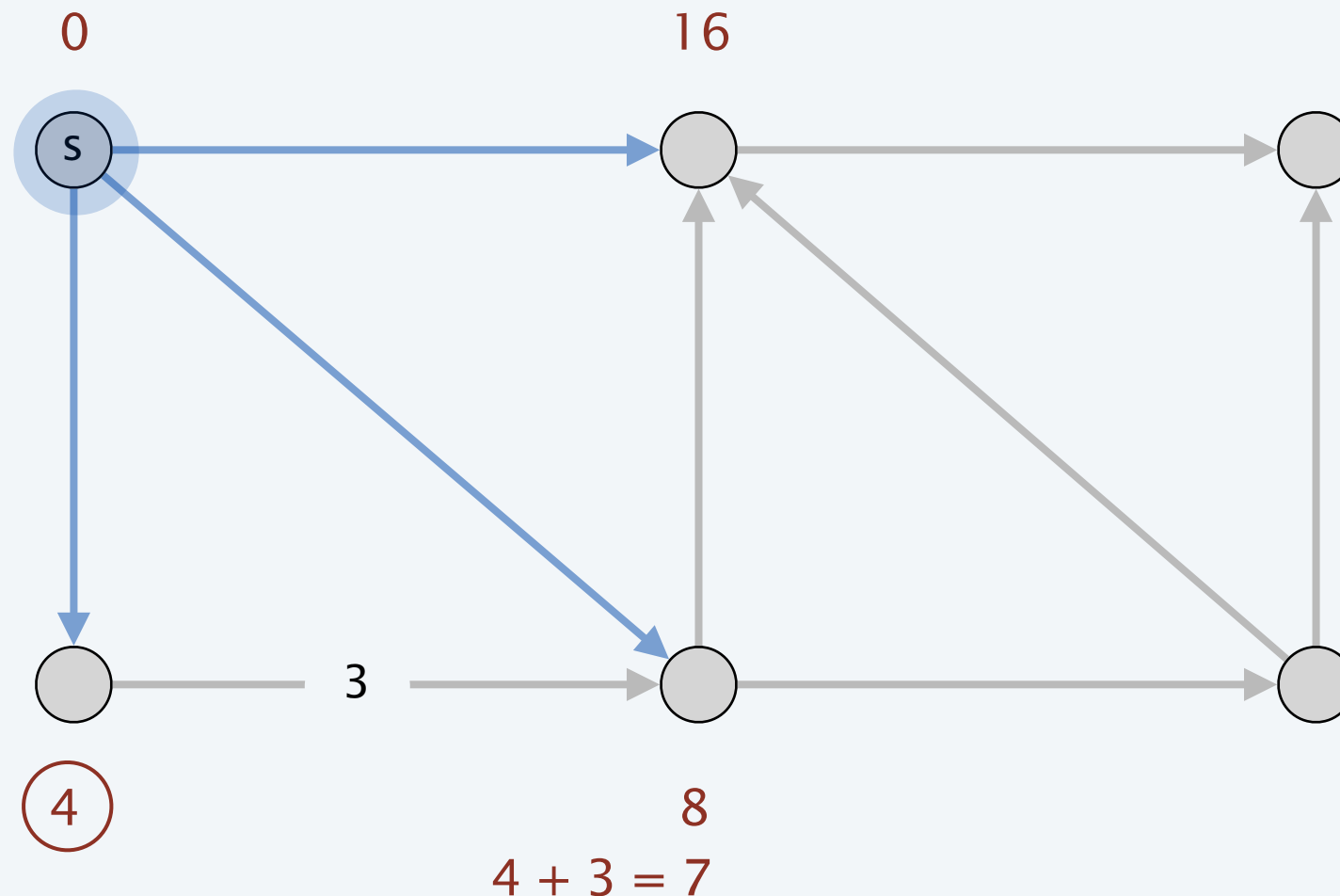
Improved Dijkstra's algorithm demo

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  - add u to S

$$4 + 3 = 7$$

Improved Dijkstra's algorithm demo

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  - add u to S

7 + 7 = 14

16

0

7

1

4

7

7 + 1 = 8

Improved Dijkstra's algorithm demo

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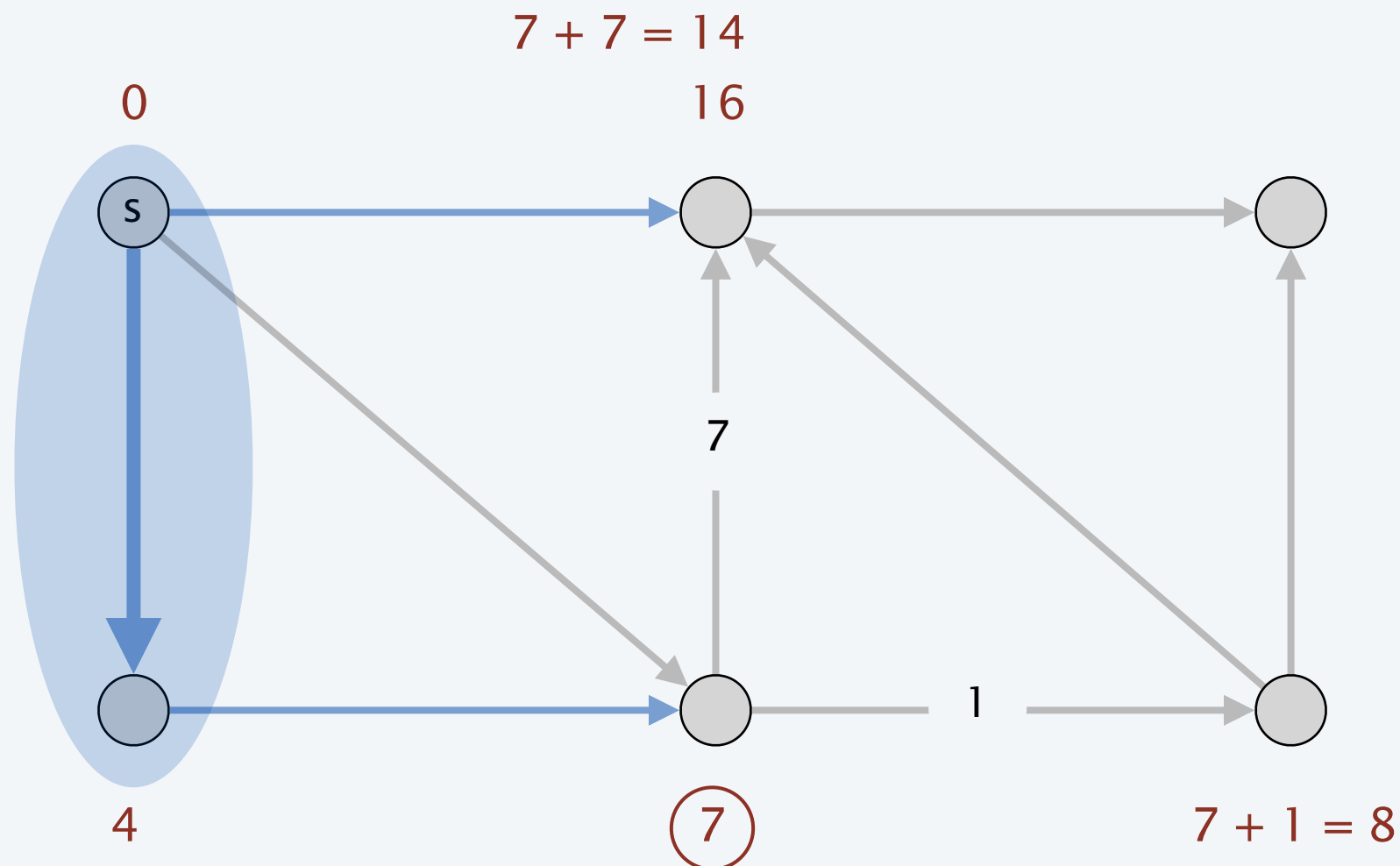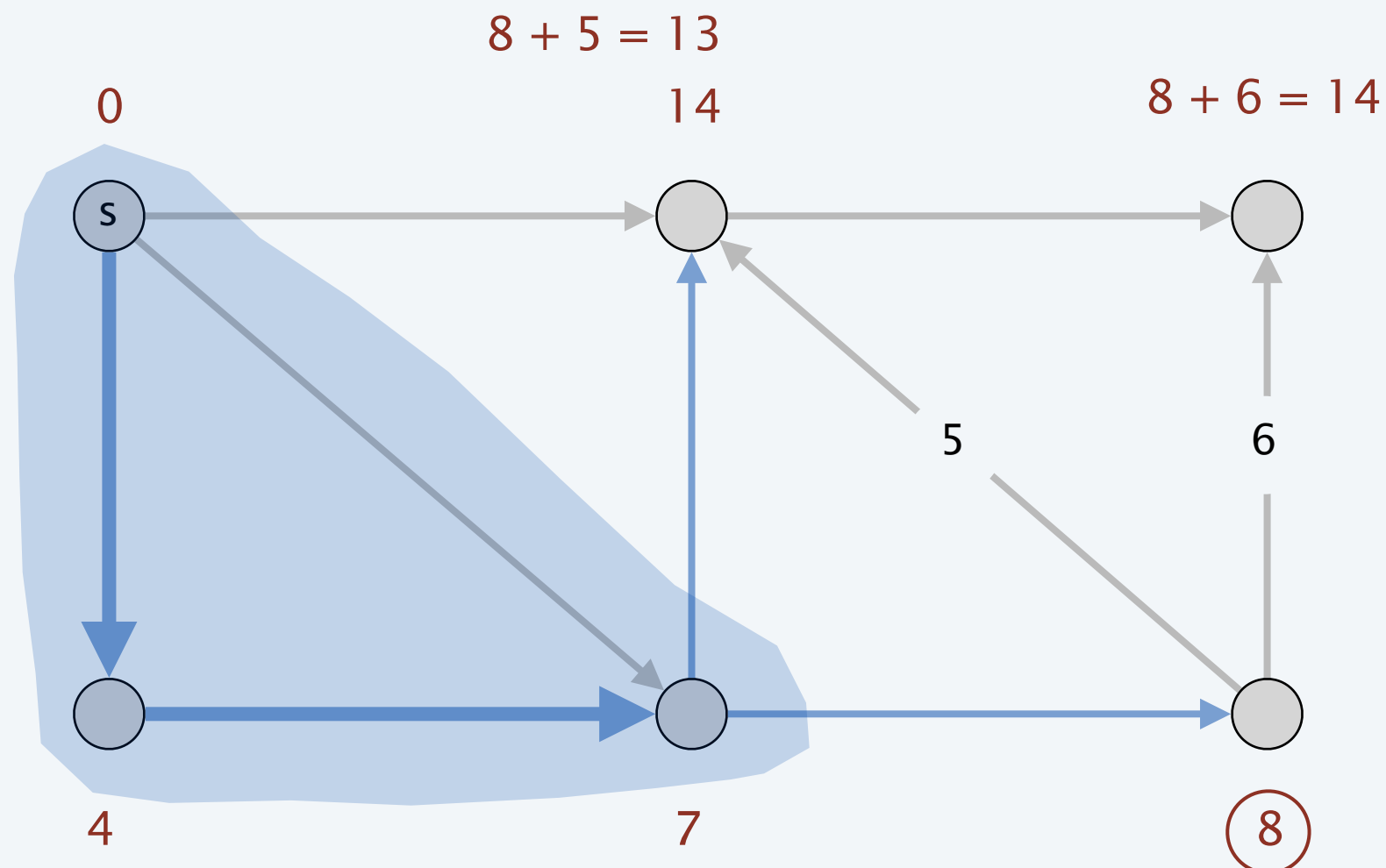 - add u to S

Improved Dijkstra's algorithm demo

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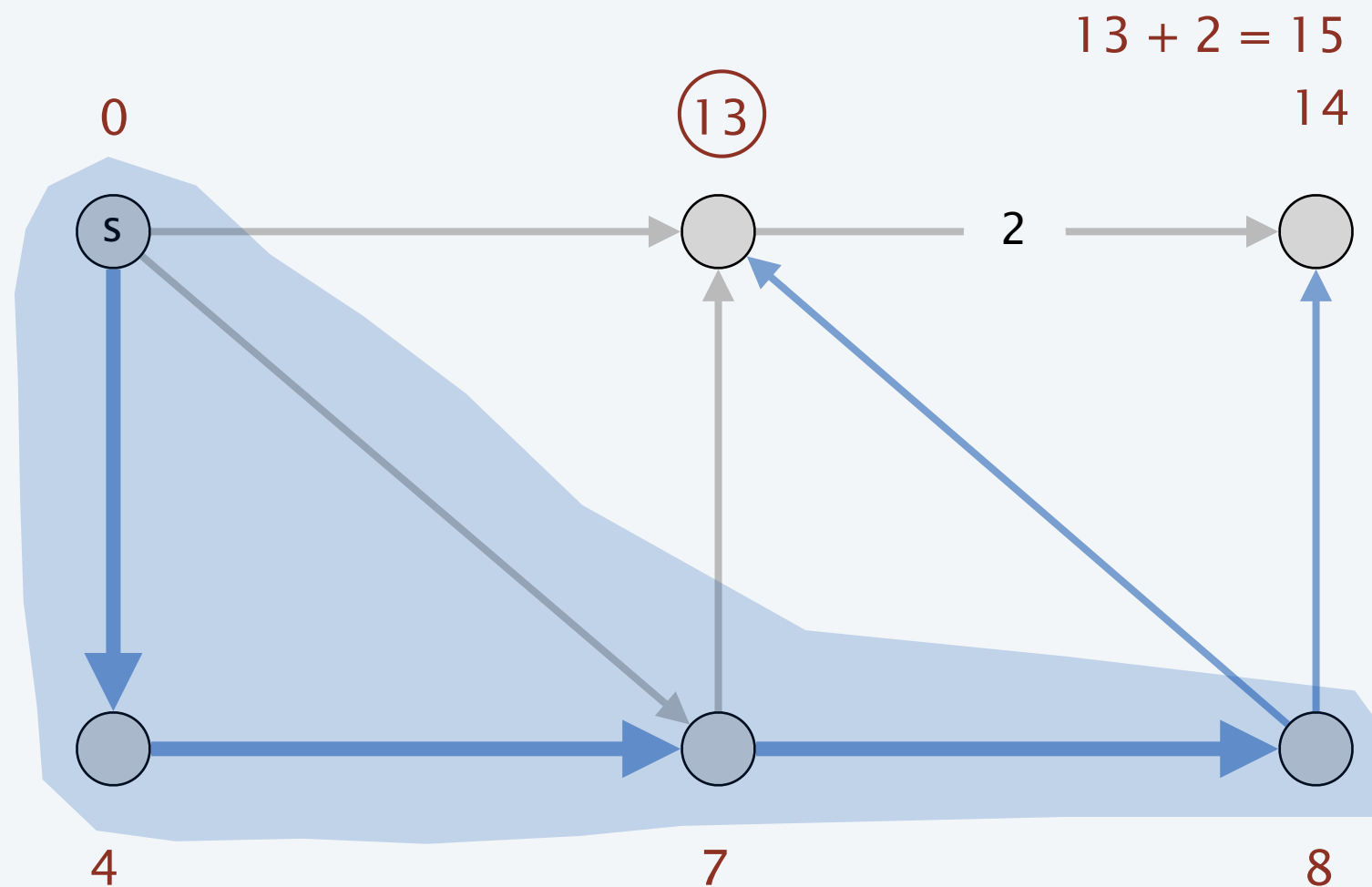 - add u to S
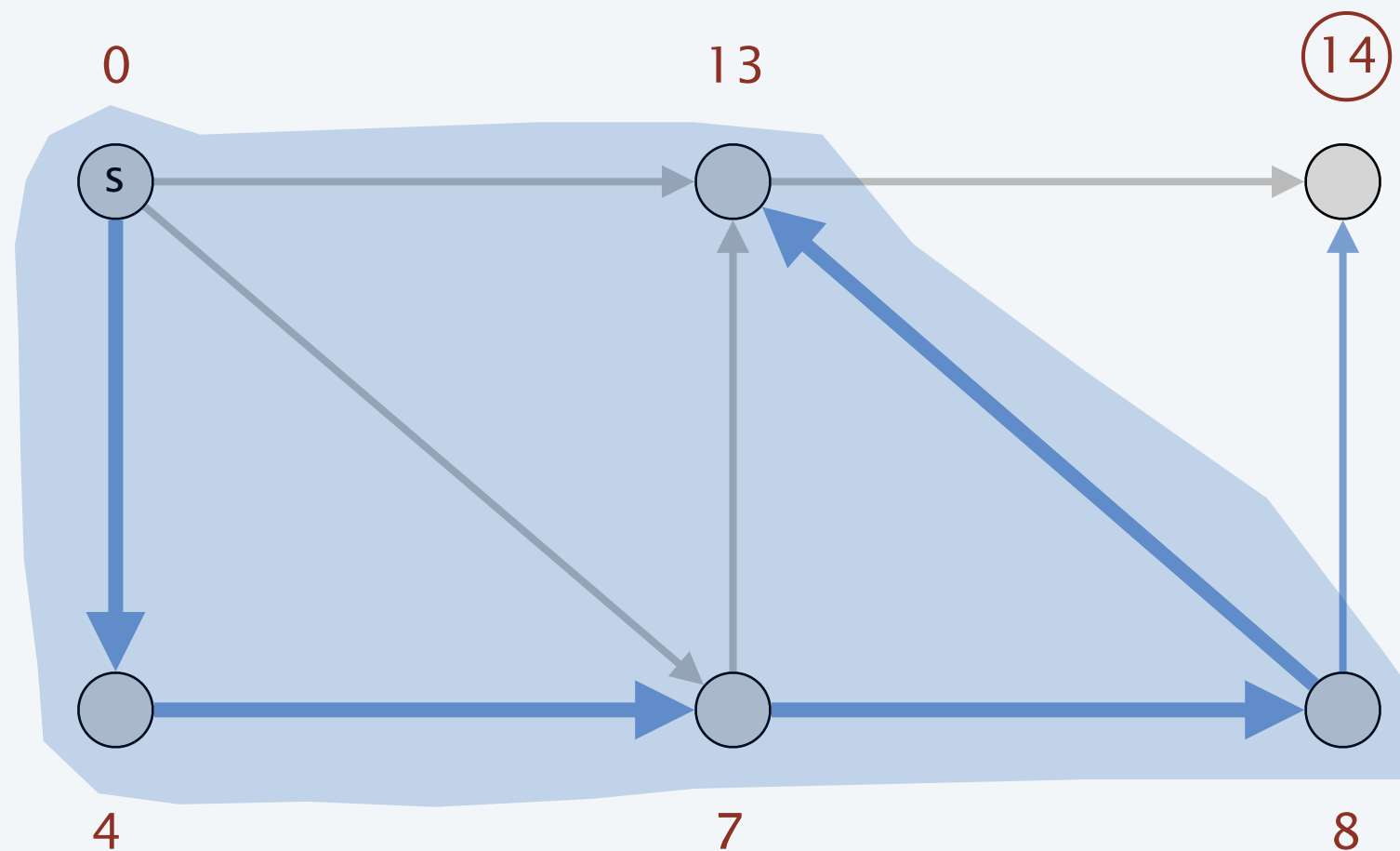
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Improved Dijkstra's algorithm demo

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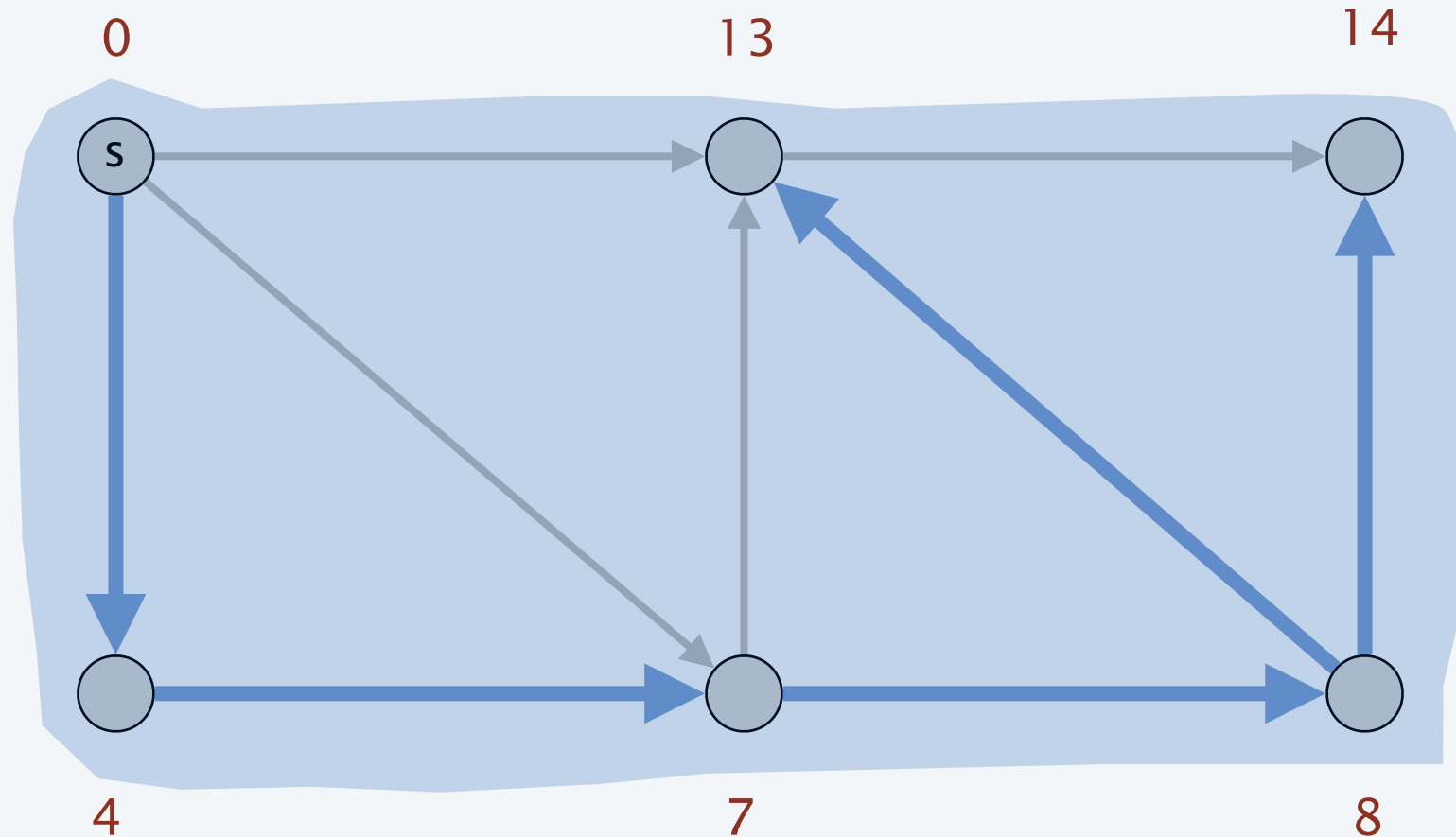 - add u to S

Improved Dijkstra's algorithm demo

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