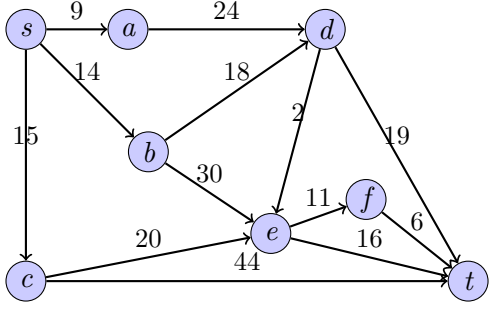
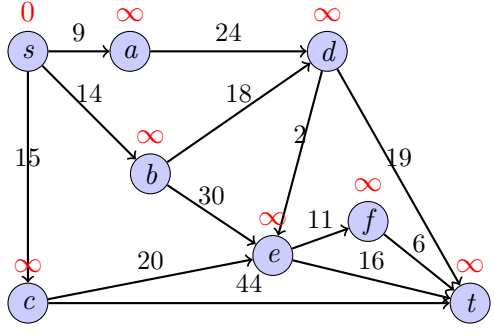
Dijkstra's algorithm: an example



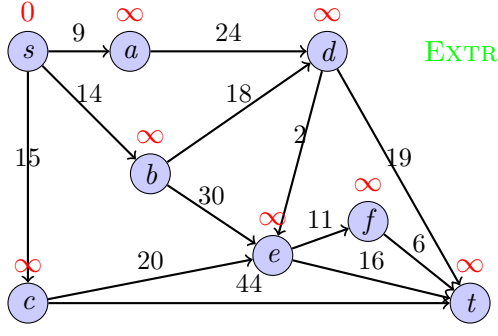
Dijkstra's algorithm: an example

$$S = \{\}$$
$$PQ = \{s(0), a(\infty), b(\infty), c(\infty), d(\infty), e(\infty), f(\infty), t(\infty)\}$$



Dijkstra's algorithm: an example

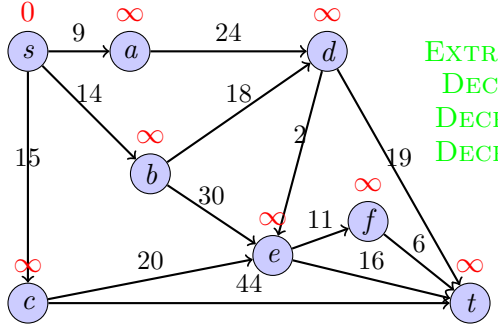
$$S = \{\}$$
$$PQ = \{s(0), a(\infty), b(\infty), c(\infty), d(\infty), e(\infty), f(\infty), t(\infty)\}$$



ExtractMin returns s

Dijkstra's algorithm: an example

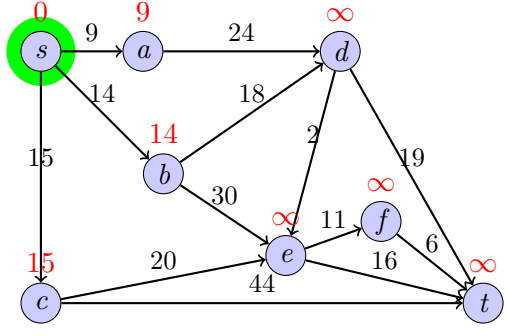
$$S = \{\}$$
$$PQ = \{s(0), a(\infty), b(\infty), c(\infty), d(\infty), e(\infty), f(\infty), t(\infty)\}$$



ExtractMin returns s
DecreaseKey$(a, 9)$
DecreaseKey$(b, 14)$
DecreaseKey$(c, 15)$

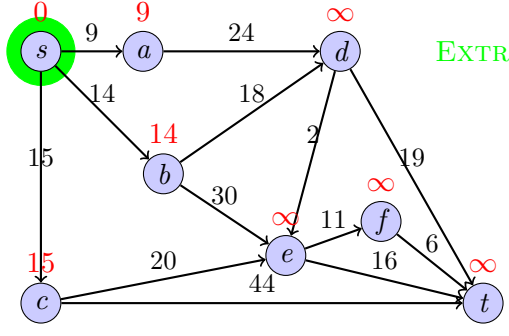
Dijkstra's algorithm: an example

$$S = \{s\}$$
$$PQ = \{a(9), b(14), c(15), d(\infty), e(\infty), f(\infty), t(\infty)\}$$



Dijkstra's algorithm: an example

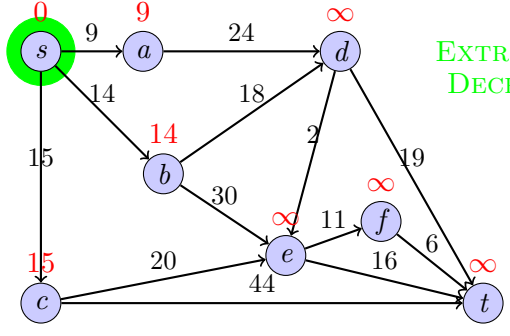
$$S = \{s\}$$
$$PQ = \{a(9), b(14), c(15), d(\infty), e(\infty), f(\infty), t(\infty)\}$$



ExtractMin returns a

Dijkstra's algorithm: an example

$$S = \{s\}$$
$$PQ = \{a(9), b(14), c(15), d(\infty), e(\infty), f(\infty), t(\infty)\}$$

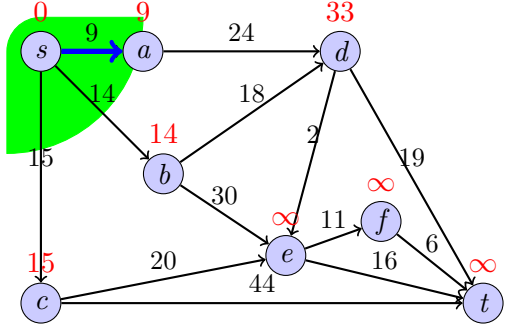


ExtractMin returns a
DecreaseKey$(d, 33)$

Dijkstra's algorithm: an example

$$S = \{s, a\}$$

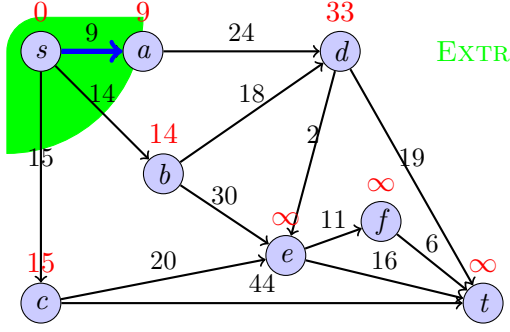
$$PQ = \{b(14), c(15), d(33), e(\infty), f(\infty), t(\infty)\}$$



Dijkstra's algorithm: an example

$$S = \{s, a\}$$

$$PQ = \{b(14), c(15), d(33), e(\infty), f(\infty), t(\infty)\}$$

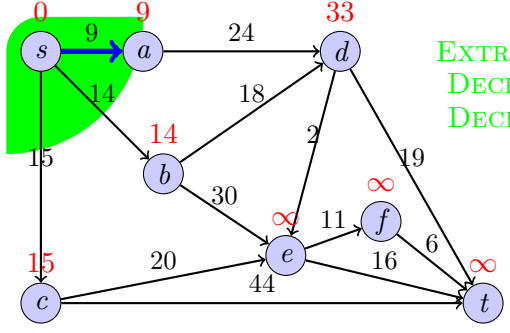


ExtractMin returns b

Dijkstra's algorithm: an example

$S = \{s, a\}$

$PQ = \{b(14), c(15), d(33), e(\infty), f(\infty), t(\infty)\}$



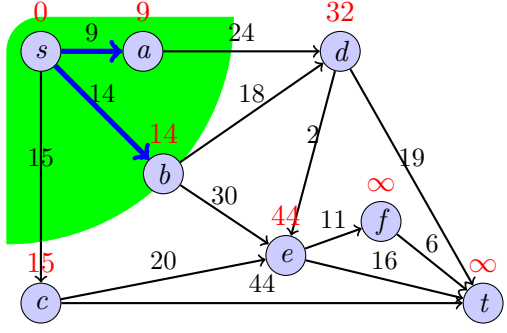
ExtractMin returns b

DecreaseKey$(d, 32)$

DecreaseKey$(e, 44)$

Dijkstra's algorithm: an example

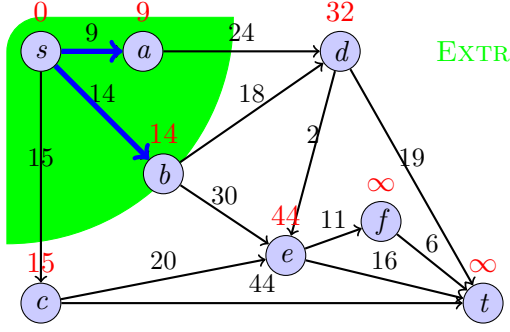
$$S = \{s, a, b\}$$
$$PQ = \{c(15), d(32), e(44), f(\infty), t(\infty)\}$$



Dijkstra's algorithm: an example

$S = \{s, a, b\}$

$PQ = \{c(15), d(32), e(44), f(\infty), t(\infty)\}$

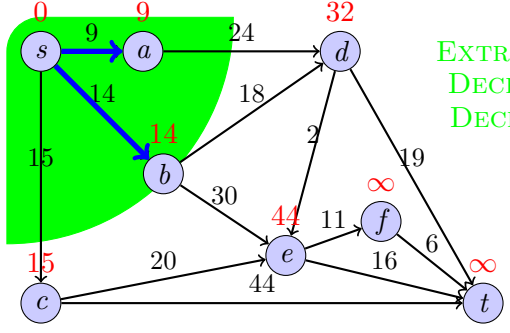


ExtractMin returns c

Dijkstra's algorithm: an example

$S = \{s, a, b\}$

$PQ = \{c(15), d(32), e(44), f(\infty), t(\infty)\}$



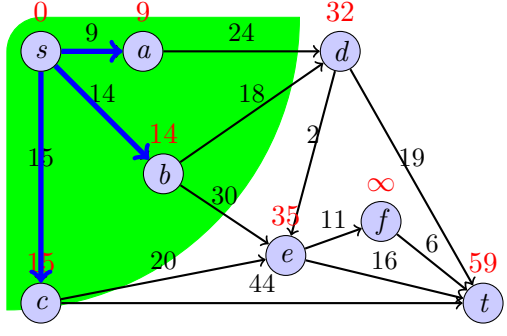
ExtractMin returns c

DecreaseKey$(e, 35)$

DecreaseKey$(t, 59)$

Dijkstra's algorithm: an example

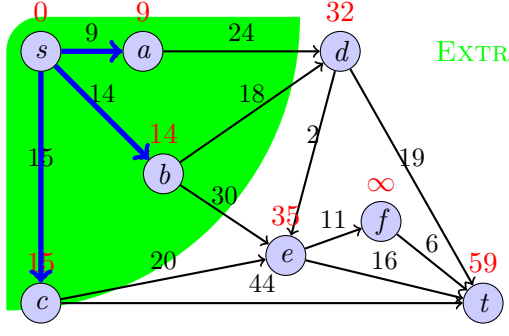
$$S = \{s, a, b, c\}$$
$$PQ = \{d(32), e(35), t(59), f(\infty)\}$$



Dijkstra's algorithm: an example

$S = \{s, a, b, c\}$

$PQ = \{d(32), e(35), t(59), f(\infty)\}$

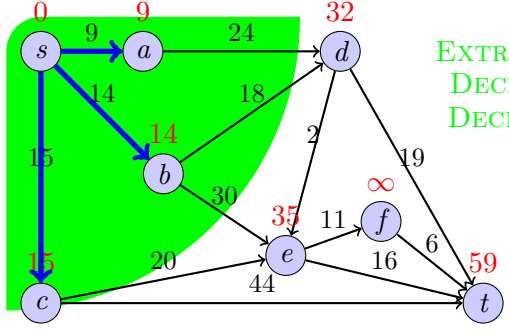


ExtractMin returns d

Dijkstra's algorithm: an example

$S = \{s, a, b, c\}$

$PQ = \{d(32), e(35), t(59), f(\infty)\}$



ExtractMin returns d

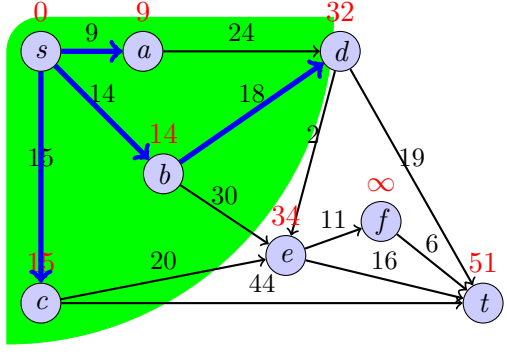
DecreaseKey$(t, 51)$

DecreaseKey$(e, 34)$

Dijkstra's algorithm: an example

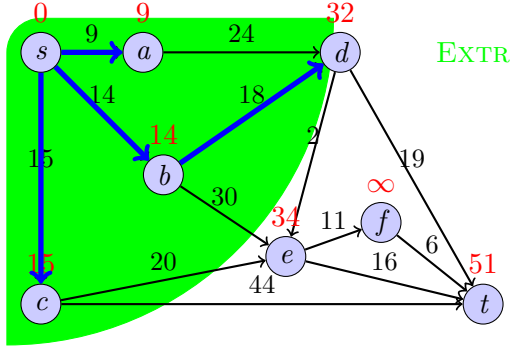
$S = \{s, a, b, c, d\}$

$PQ = \{e(34), t(51), f(\infty)\}$



Dijkstra's algorithm: an example

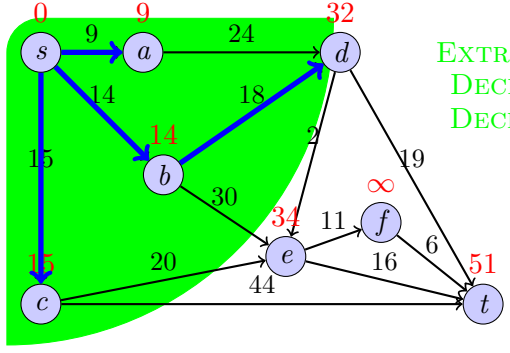
$S = \{s, a, b, c, d\}$
$PQ = \{e(34), t(51), f(\infty)\}$



ExtractMin returns e

Dijkstra's algorithm: an example

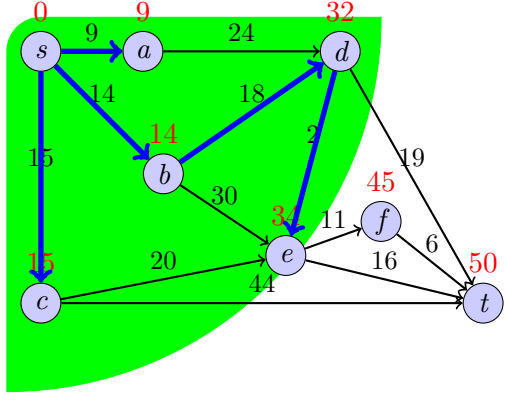
$S = \{s, a, b, c, d\}$
$PQ = \{e(34), t(51), f(\infty)\}$



ExtractMin returns e
DecreaseKey$(f, 45)$
DecreaseKey$(t, 50)$

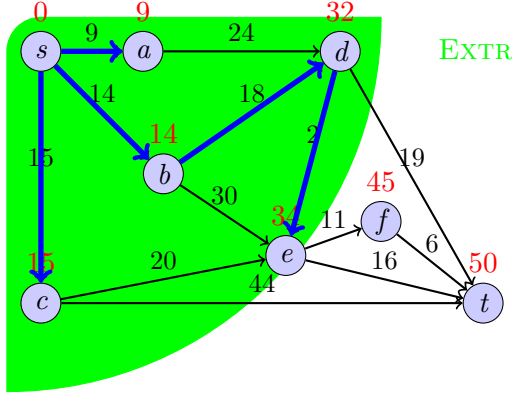
Dijkstra's algorithm: an example

$S = \{s, a, b, c, d, e\}$
$PQ = \{f(45), t(50)\}$



Dijkstra's algorithm: an example

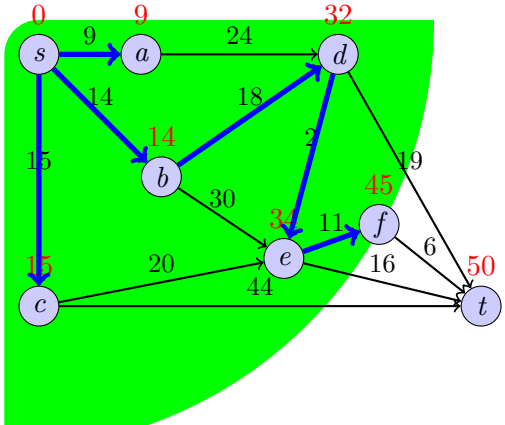
$S = \{s, a, b, c, d, e\}$
$PQ = \{f(45), t(50)\}$



ExtractMin returns f

Dijkstra's algorithm: an example

$S = \{s, a, b, c, d, e, f\}$
$PQ = \{t(50)\}$



Dijkstra's algorithm: an example

$$S = \{s, a, b, c, d, e, f, t\}$$
$$PQ = \{\}$$