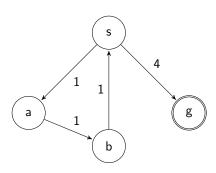
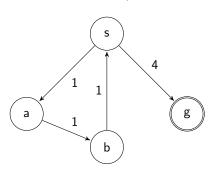
$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$



$$Q(s,g) = -3$$
  
 $Q(s,a) = -2$   
 $= Q(a,b) = Q(b,s)$ 

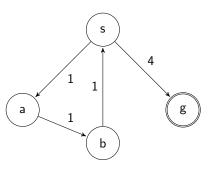
$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$



$$Q(g,g) = 1 + \frac{1}{2}Q(g,g)$$
  
 
$$\therefore Q(g,g) = 2$$

$$Q(s,g) = -3$$
  
 $Q(s,a) = -2$   
 $= Q(a,b) = Q(b,s)$ 

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \ Q(\mathsf{g},\mathsf{g}) &= 1 + rac{1}{2} Q(\mathsf{g},\mathsf{g}) \end{aligned}$$



$$Q(g,g) = 1 + \frac{1}{2}Q(g,g)$$
  
 $Q(g,g) = 2$   
 $Q(g,g) = -4 + \frac{1}{2}Q(g,g) = -3$ 

$$Q(s,g) = -3$$
  
 $Q(s,a) = -2$   
 $= Q(a,b) = Q(b,s)$ 

$$Q(s,s') := Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid arc_{=}(s',s'')\}$$
 $Q_0(s,s') := \left\{egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } arc(s,s') \end{array}
ight.$ 
 $Q(g,g) = 1 + rac{1}{2}Q(g,g) \ \therefore Q(g,g) = 2$ 
 $Q(s,g) = -4 + rac{1}{2}Q(g,g) = -3$ 

$$Q(s,g) = -3$$
 $Q(s,a) = -2$ 
 $= Q(a,b) = Q(b,s)$ 

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid arc_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } arc(s,s') \end{array} 
ight. \end{aligned}$$

Q(s,g) = -3

Q(s,a) = -2

$$=-3$$
 Case 1:  $Q(s,a) \ge -3$   
 $=-2$  Case 2:  $Q(s,a) < -3$   
 $= Q(a,b) = Q(b,s)$  contradiction

 $Q(g,g) = 1 + \frac{1}{2}Q(g,g)$ 

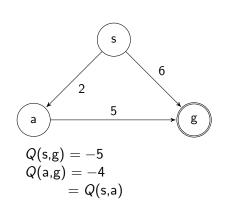
 $Q(s,a) = -1 + \frac{1}{2}Q(a,b)$  $Q(a,b) = -1 + \frac{1}{2}Q(b,s)$ 

 $Q(s,g) = -4 + \frac{1}{2}Q(g,g) = -3$ 

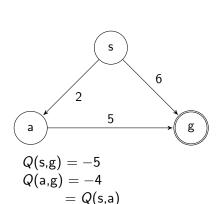
 $Q(b,s) = -1 + \frac{1}{2} max \{Q(s,a), -3\}$ 

Q(g,g) = 2

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$

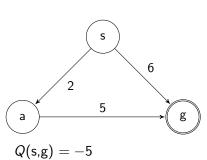


$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$



$$Q(g,g) = 1 + \frac{1}{2}Q(g,g)$$
  
 
$$\therefore Q(g,g) = 2$$

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$



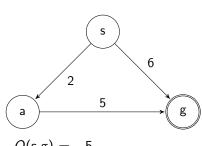
$$\therefore Q(g,g) = 2$$

$$Q(s,g) = -6 + \frac{1}{2}Q(g,g) = -5$$

 $Q(g,g) = 1 + \frac{1}{2}Q(g,g)$ 

$$Q(s,g) = -5$$
  
 $Q(a,g) = -4$   
 $= Q(s,a)$ 

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$

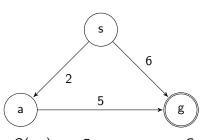


$$\begin{aligned} Q(\mathsf{s},\mathsf{g}) &= -5 \\ Q(\mathsf{a},\mathsf{g}) &= -4 \\ &= Q(\mathsf{s},\mathsf{a}) \end{aligned}$$

$$Q(g,g) = 1 + \frac{1}{2}Q(g,g)$$
  
 $\therefore Q(g,g) = 2$   
 $Q(s,g) = -6 + \frac{1}{2}Q(g,g) = -5$ 

$$Q(s,a) = -2 + \frac{1}{2}Q(a,g)$$
  
 $Q(a,g) = -5 + \frac{1}{2}Q(g,g)$ 

$$egin{aligned} Q(s,s') &:= Q_0(s,s') + rac{1}{2} \max\{Q(s',s'') \mid \mathit{arc}_=(s',s'')\} \ Q_0(s,s') &:= \left\{ egin{array}{ll} 1 & ext{if } s = s' \in G \ - ext{cost}(s,s') & ext{else if } \mathit{arc}(s,s') \end{array} 
ight. \end{aligned}$$



$$Q(s,g) = -5$$

$$Q(a,g) = -4$$

$$= Q(s,a)$$

∴ 
$$Q(g,g) = 2$$
  
 $Q(s,g) = -6 + \frac{1}{2}Q(g,g) = -5$ 

$$Q(s,a) = -2 + \frac{1}{2}Q(a,g)$$
  
 $Q(a,g) = -5 + \frac{1}{2}Q(g,g)$ 

 $Q(g,g) = 1 + \frac{1}{2}Q(g,g)$ 

Compare to iterates
$$Q_{n+1}(s,s') := Q_0(s,s') +$$

$$\frac{1}{2} \max\{Q_n(s', s'') \mid arc_{=}(s', s'')\}$$