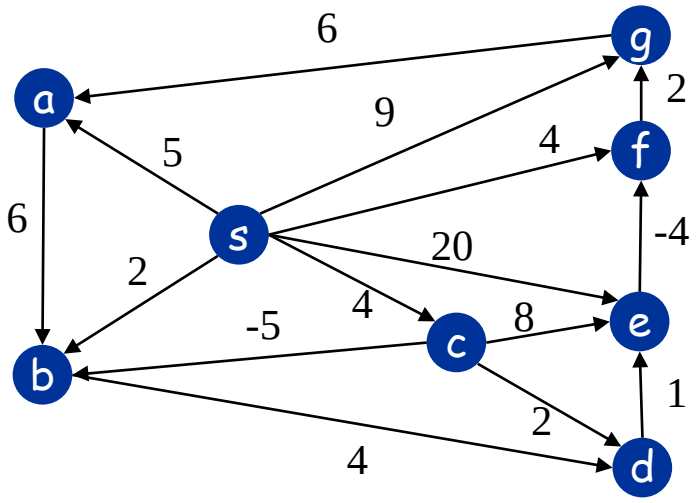
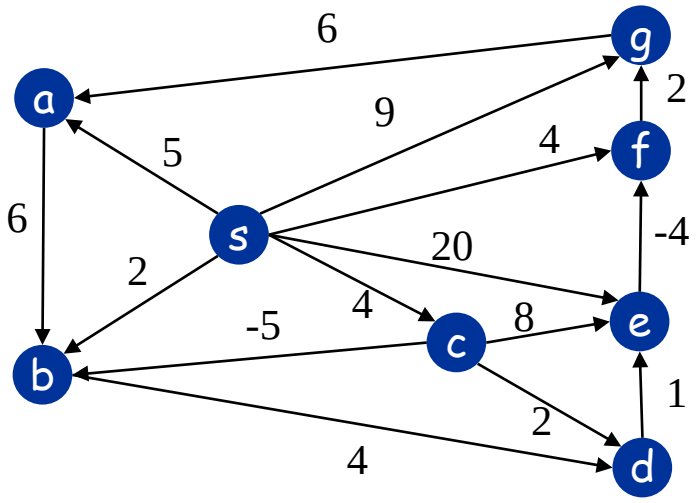
Another Bellman-Ford Example



Run the Bellman-Ford Algorithm, starting from vertex s.

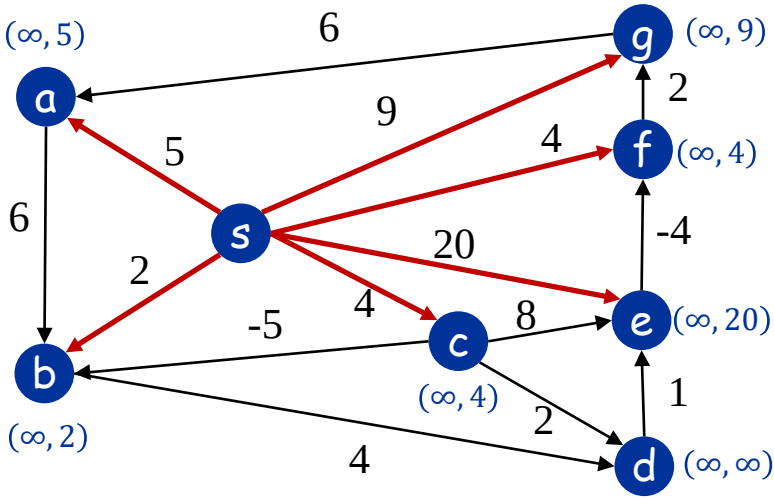
v.d/v.d[i] (v.p[i])	i=0
s	0
a	∞
b	∞
c	∞
d	∞
e	∞
f	∞
g	∞

Another Bellman-Ford Example



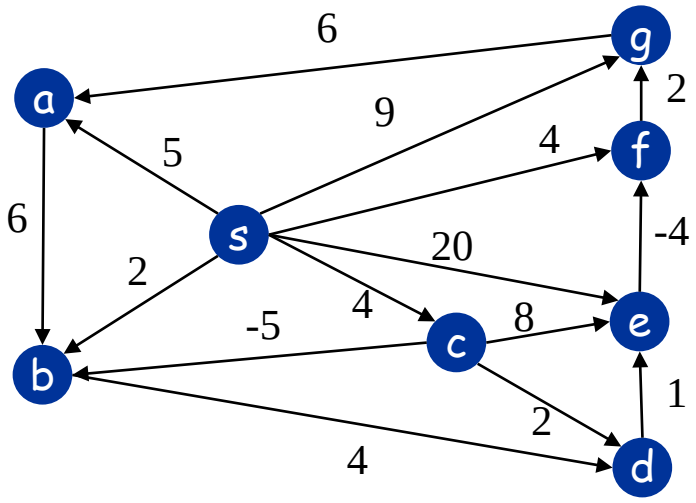
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1
s	0	0
a	∞	**5 (s)**
b	∞	**2 (s)**
c	∞	**4 (s)**
d	∞	∞
e	∞	**20 (s)**
f	∞	**4 (s)**
g	∞	**9 (s)**



$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

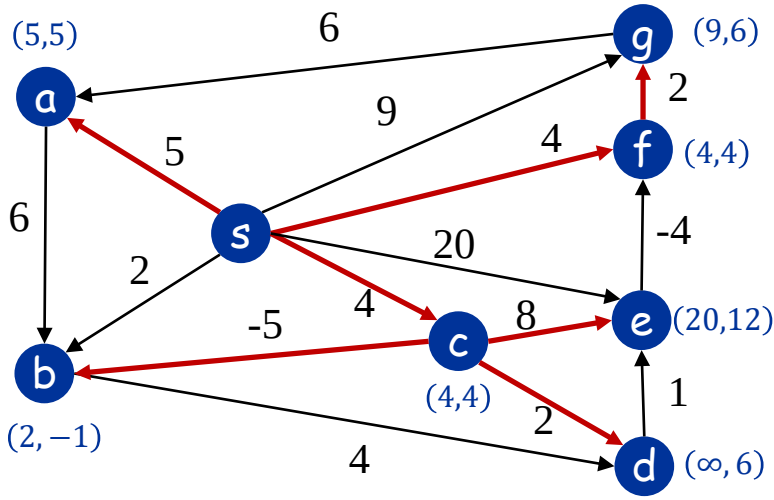
Another Bellman-Ford Example



Run the Bellman-Ford Algorithm, starting from vertex s.

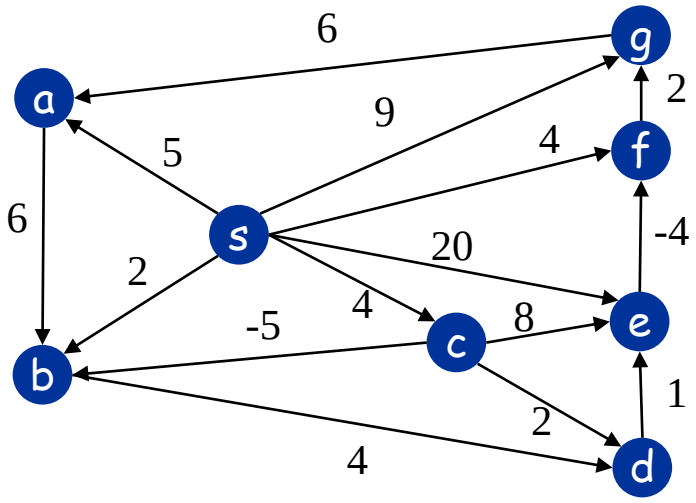
Note: there are two possibilities for *d.p[2]*, *b* and *c*. Algorithm can break ties arbitrarily. We chose *c*.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2
s	0	0	0
a	∞	5 (s)	5 (s)
b	∞	2 (s)	**-1(c)**
c	∞	4 (s)	4(s)
d	∞	∞	**6(b,c)**
e	∞	20 (s)	**12(c)**
f	∞	4 (s)	4(s)
g	∞	9 (s)	**6(f)**



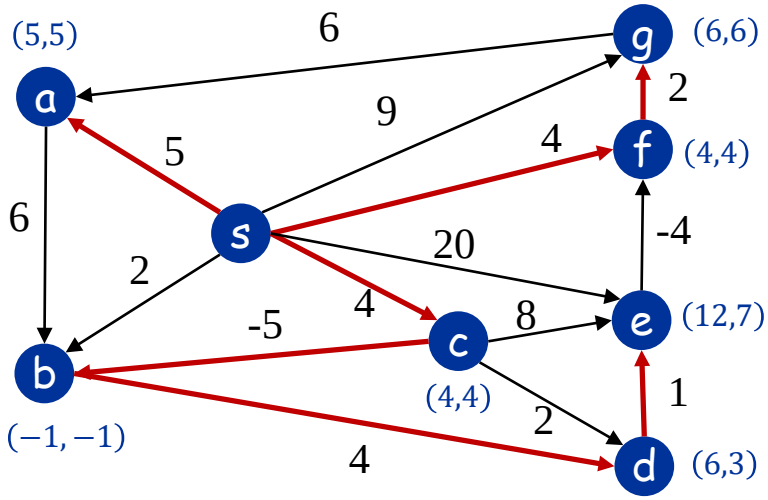
$(a, b) = (\text{v. d[i} - 1], \text{v. d[i]})$

Another Bellman-Ford Example



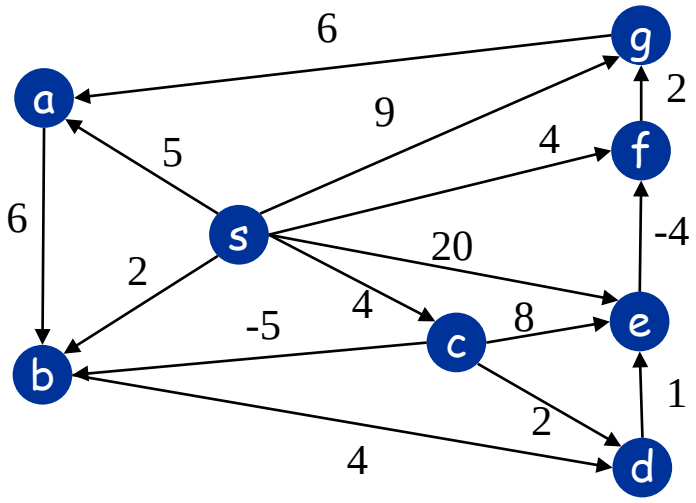
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2	i=3
s	0	0	0	0
a	∞	5 (s)	5 (s)	5 (s)
b	∞	2 (s)	-1(c)	-1(c)
c	∞	4 (s)	4(s)	4(s)
d	∞	∞	6(b,c)	**3(b)**
e	∞	20 (s)	12(c)	**7(d)**
f	∞	4 (s)	4(s)	4(s)
g	∞	9 (s)	6(f)	6(f)



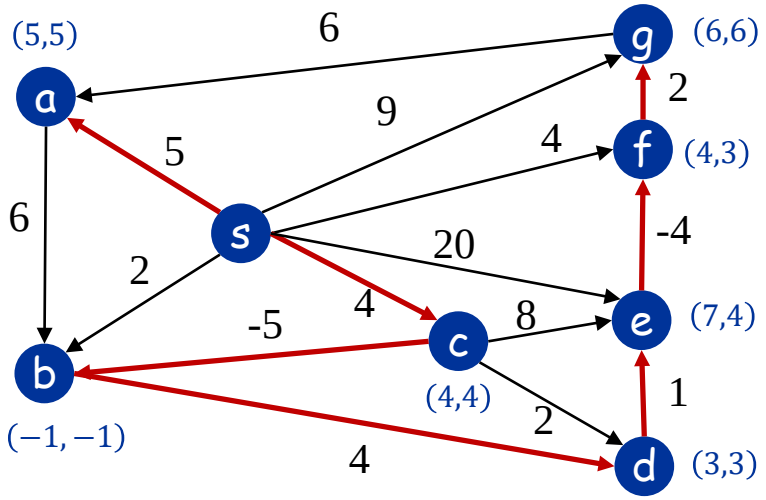
$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

Another Bellman-Ford Example



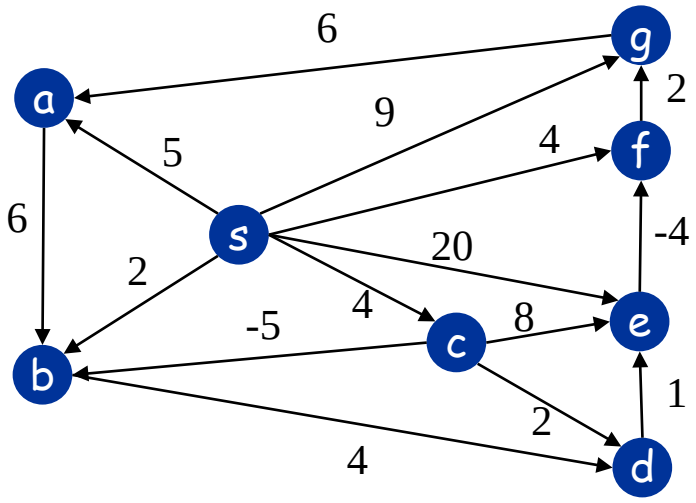
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2	i=3	i=4
s	0	0	0	0	0
a	∞	5 (s)	5 (s)	5 (s)	5 (s)
b	∞	2 (s)	-1(c)	-1(c)	-1(c)
c	∞	4 (s)	4(s)	4(s)	4(s)
d	∞	∞	6(b,c)	3(b)	3(b)
e	∞	20 (s)	12(c)	7(d)	**4(d)**
f	∞	4 (s)	4(s)	4(s)	**3(e)**
g	∞	9 (s)	6(f)	6(f)	6(f)



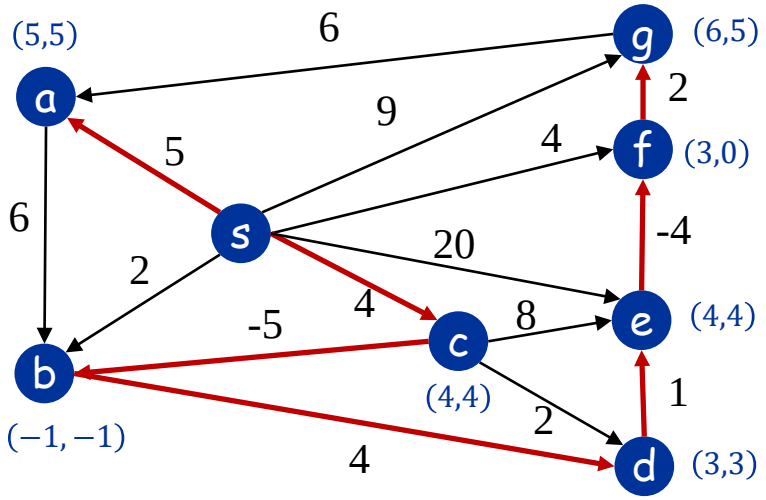
$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

Another Bellman-Ford Example



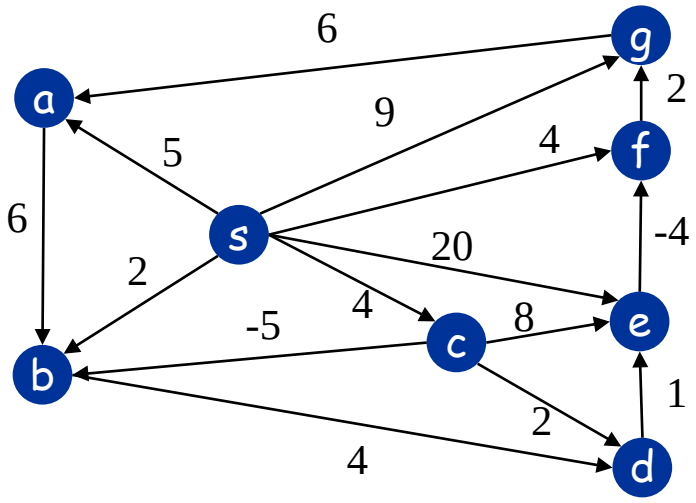
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2	i=3	i=4	i=5
s	0	0	0	0	0	0
a	∞	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)
b	∞	2 (s)	-1(c)	-1(c)	-1(c)	-1(c)
c	∞	4 (s)	4(s)	4(s)	4(s)	4(s)
d	∞	∞	6(b,c)	3(b)	3(b)	3(b)
e	∞	20 (s)	12(c)	7(d)	4(d)	4(d)
f	∞	4 (s)	4(s)	4(s)	3(e)	**0(e)**
g	∞	9 (s)	6(f)	6(f)	6(f)	**5(f)**



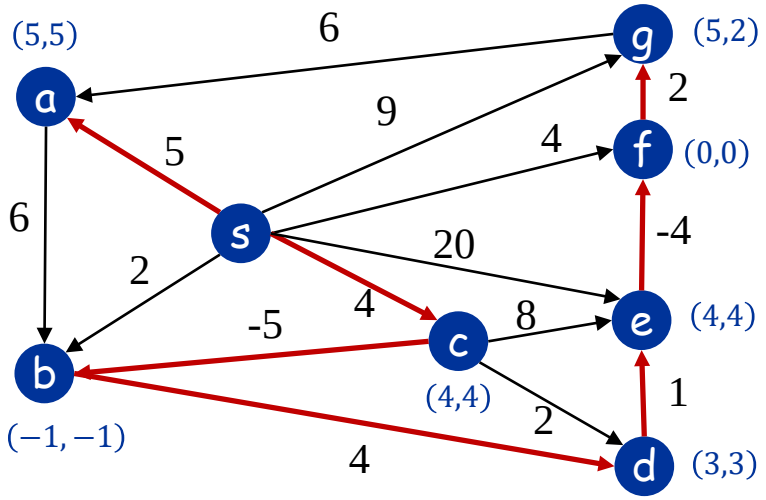
$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

Another Bellman-Ford Example



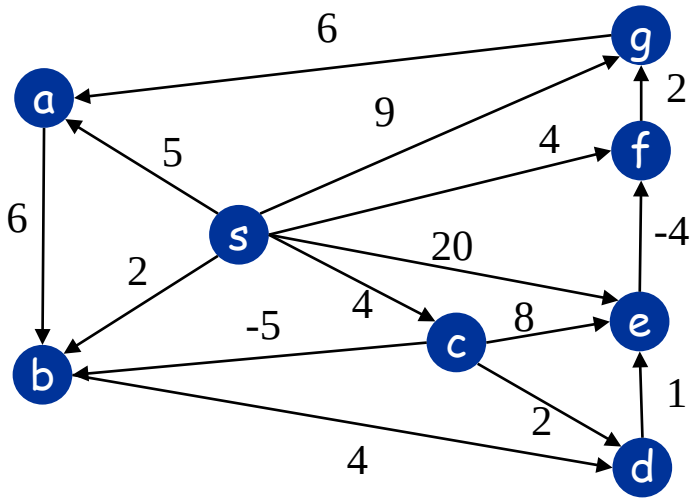
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2	i=3	i=4	i=5	i=6
s	0	0	0	0	0	0	0
a	∞	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)
b	∞	2 (s)	-1(c)	-1(c)	-1(c)	-1(c)	-1(c)
c	∞	4 (s)	4(s)	4(s)	4(s)	4(s)	4(s)
d	∞	∞	6(b,c)	3(b)	3(b)	3(b)	3(b)
e	∞	20 (s)	12(c)	7(d)	4(d)	4(d)	4(d)
f	∞	4 (s)	4(s)	4(s)	3(e)	0(e)	0(e)
g	∞	9 (s)	6(f)	6(f)	6(f)	5(f)	**2(f)**



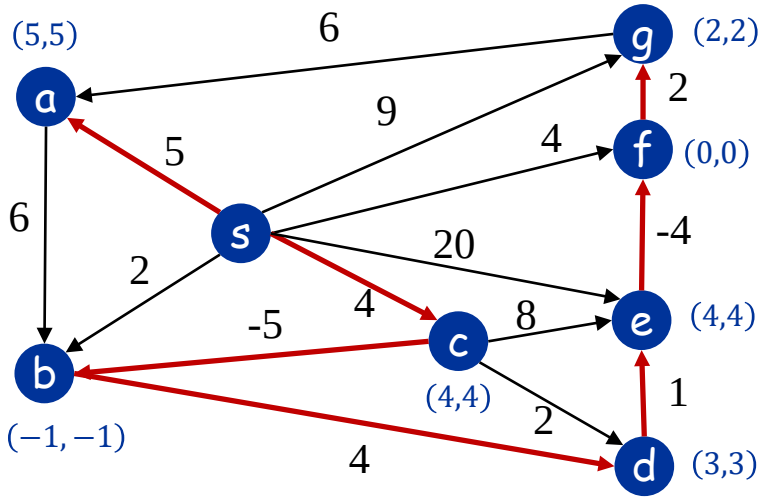
$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

Another Bellman-Ford Example



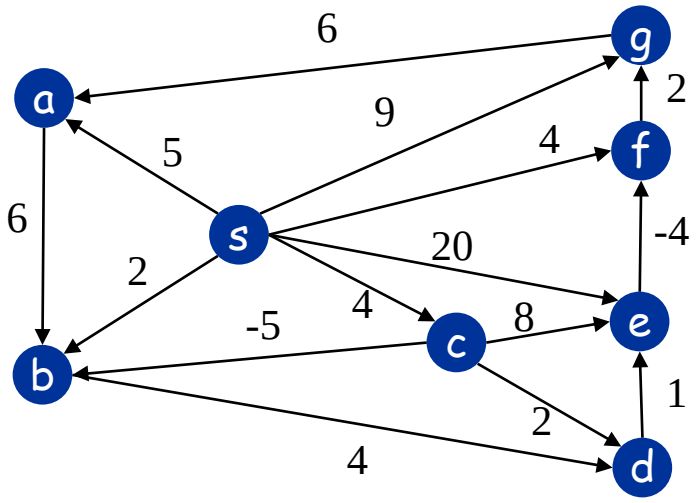
Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=0	i=1	i=2	i=3	i=4	i=5	i=6	i=7
s	0	0	0	0	0	0	0	0
a	∞	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)	5 (s)
b	∞	2 (s)	-1(c)	-1(c)	-1(c)	-1(c)	-1(c)	-1(c)
c	∞	4 (s)	4(s)	4(s)	4(s)	4(s)	4(s)	4(s)
d	∞	∞	6(b,c)	3(b)	3(b)	3(b)	3(b)	3(b)
e	∞	20 (s)	12(c)	7(d)	4(d)	4(d)	4(d)	4(d)
f	∞	4 (s)	4(s)	4(s)	3(e)	0(e)	0(e)	0(e)
g	∞	9 (s)	6(f)	6(f)	6(f)	5(f)	2(f)	2(f)



$(a, b) = (\mathrm{v.d[i-1]}, \mathrm{v.d[i]})$

Another Bellman-Ford Example



Run the Bellman-Ford Algorithm, starting from vertex s.

v.d/v.d[i] (v.p[i])	i=7
s	0
a	5 (s)
b	-1(c)
c	4(s)
d	3(b)
e	4(d)
f	0(e)
g	2(f)

Final column v.d values report shortest path distances from s.

The v.p values form a shortest path tree.