

# The Dijkstra Algorithm

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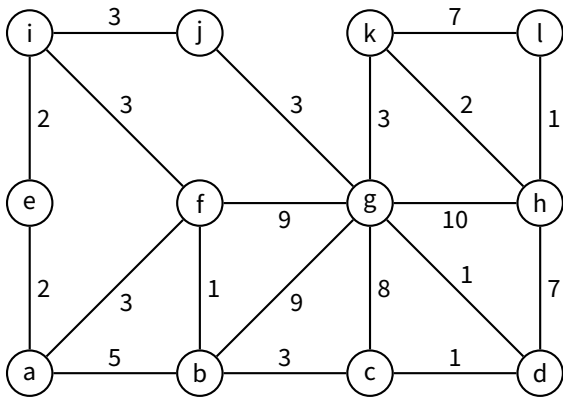
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  - ▶  $N$ , nodes of  $G$  whose least-cost path from  $u$  is definitely known

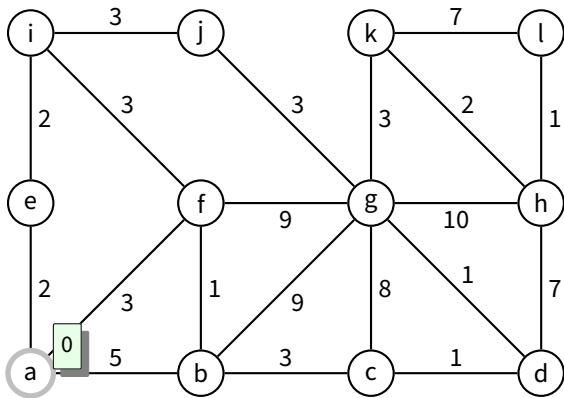
**DIJKSTRA**( $G, u, w$ )

```
1   $N = \emptyset$ 
2  for each vertex  $v \in V(G)$ 
3       $D[v] = \infty$ 
4       $P[v] = \text{NIL}$ 
5   $D[u] = 0$ 
6  while  $N \neq V(G)$ 
7      find  $u \notin N$  such that  $D[u]$  is minimal
8       $N = N \cup \{u\}$ 
9      for all  $v \in \text{Adj}(u) \setminus N$ 
10         if  $D[u] + w(u, v) < D[v]$ 
11              $D[v] = D[u] + w(u, v)$ 
12              $P[v] = u$ 
```

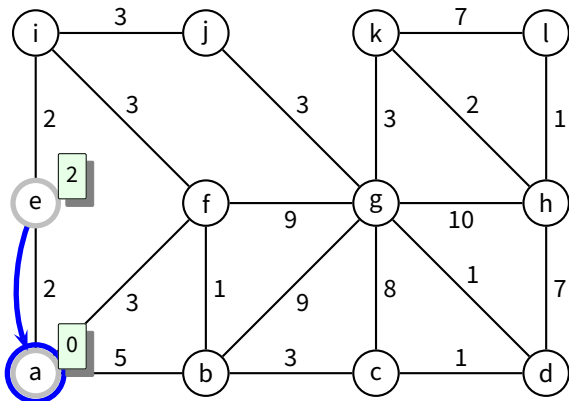
# Example



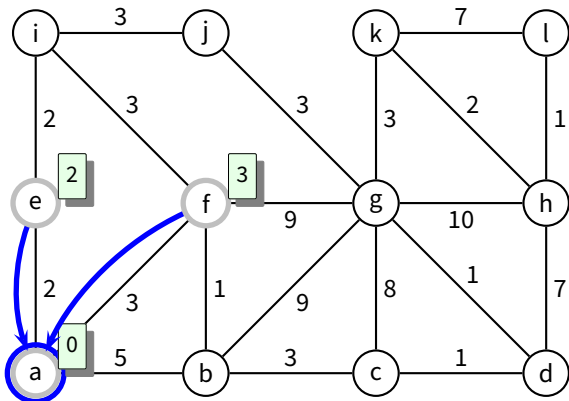
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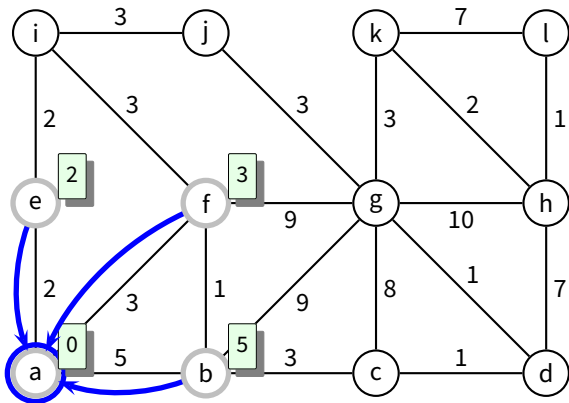
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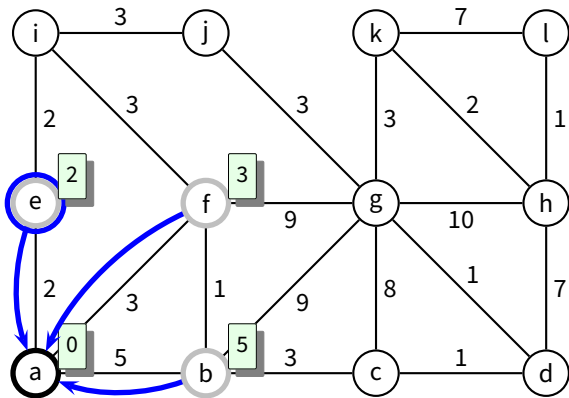
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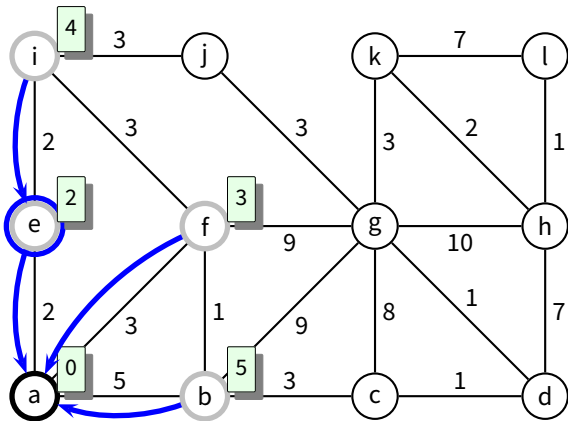
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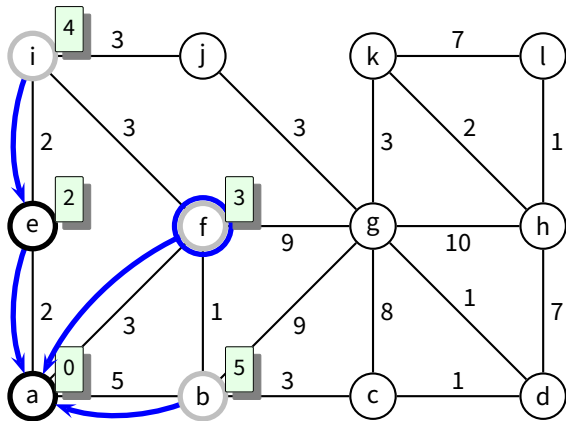
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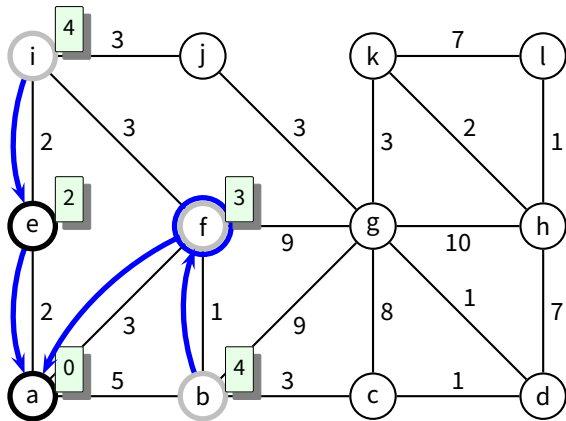
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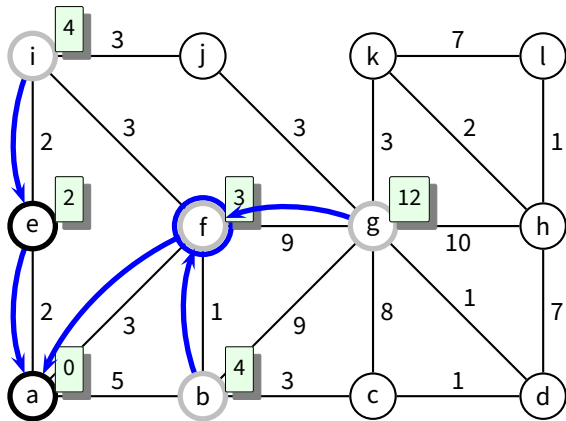
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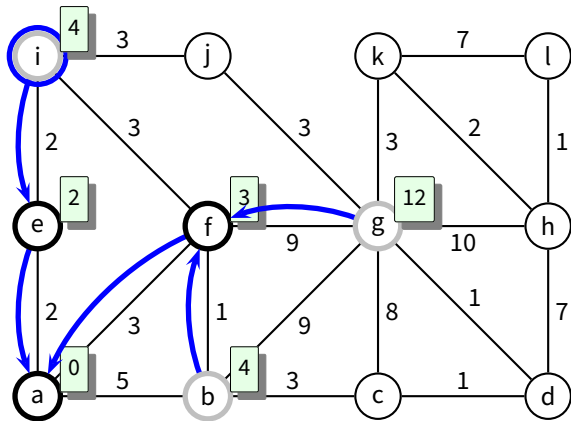
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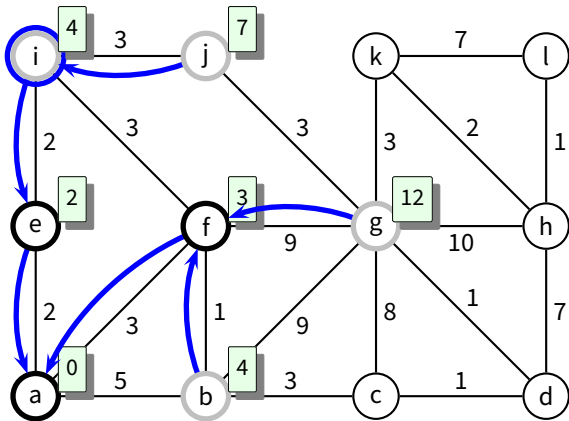
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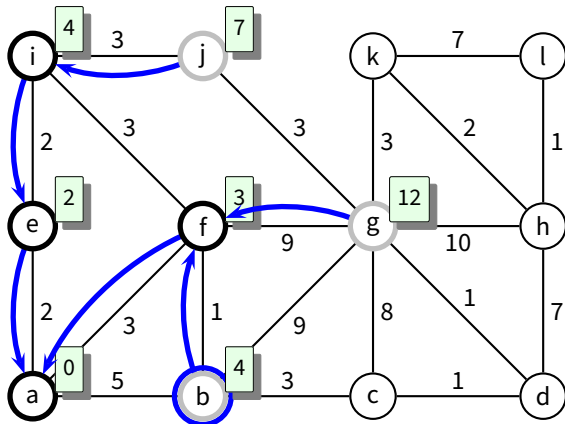
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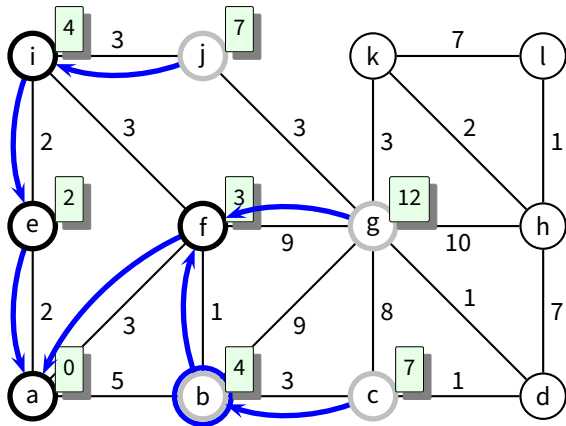
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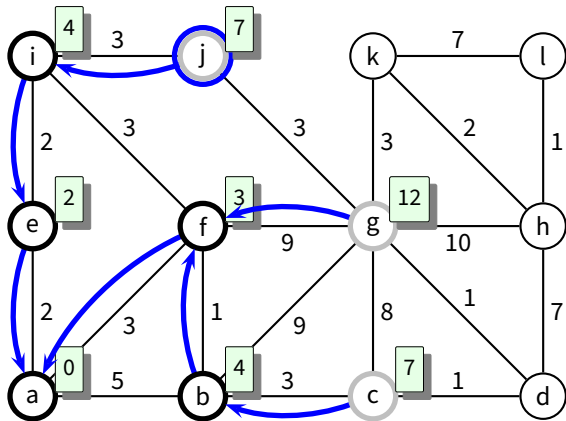
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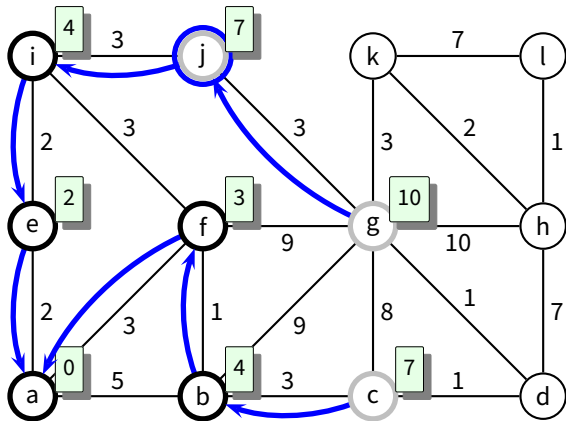
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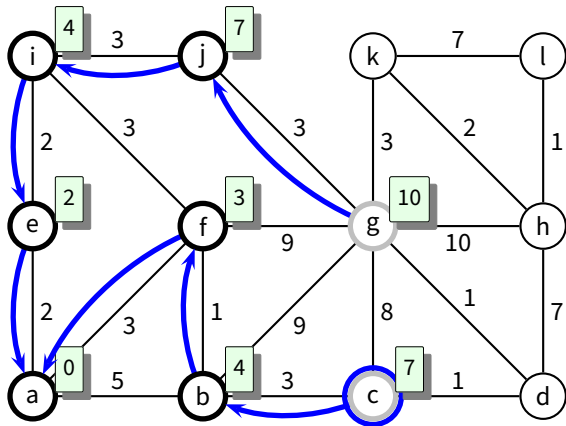
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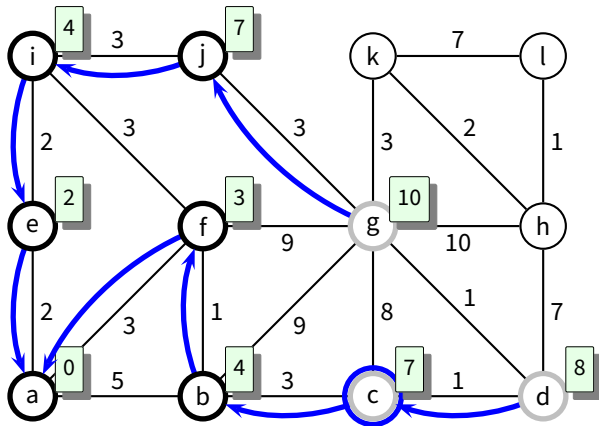
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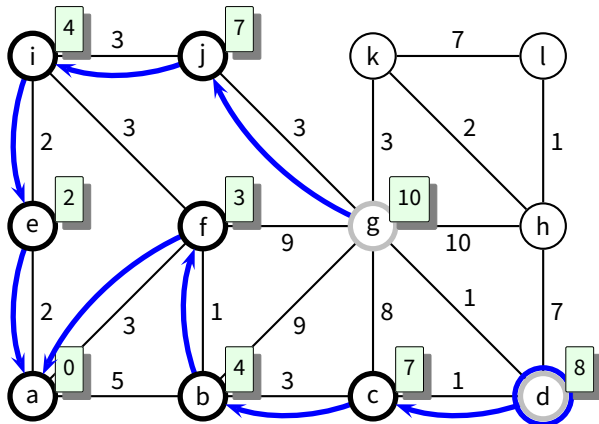
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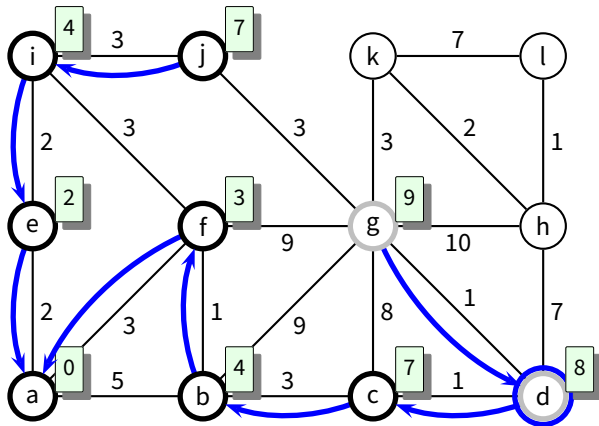
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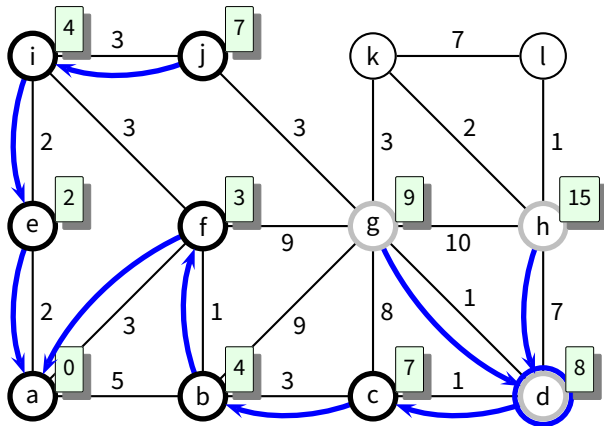
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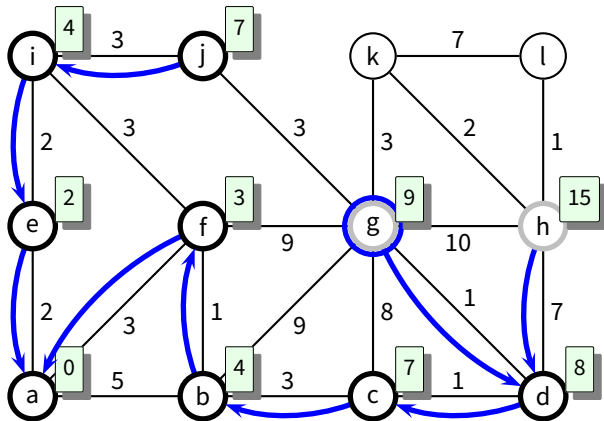
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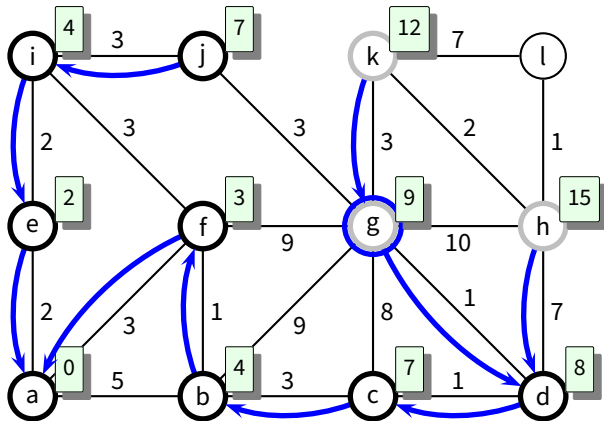
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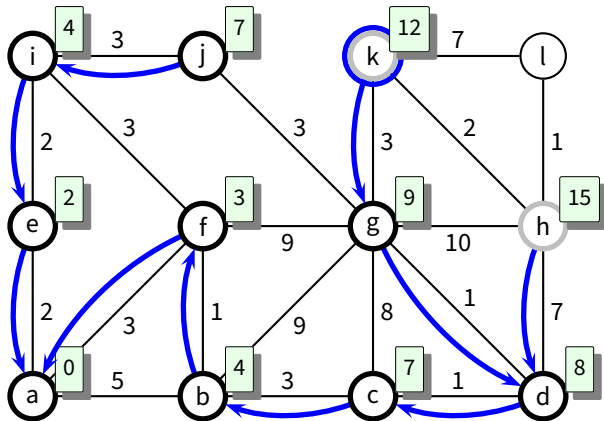
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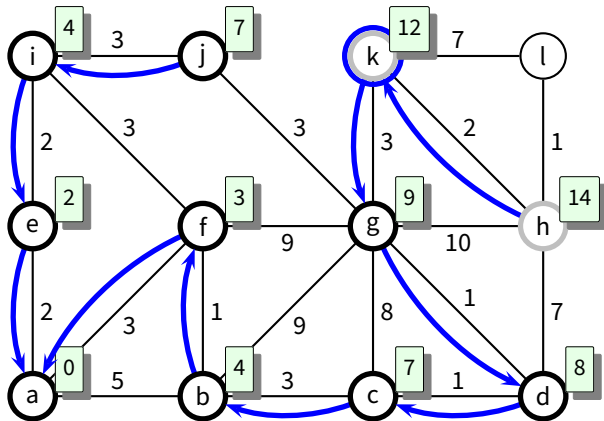
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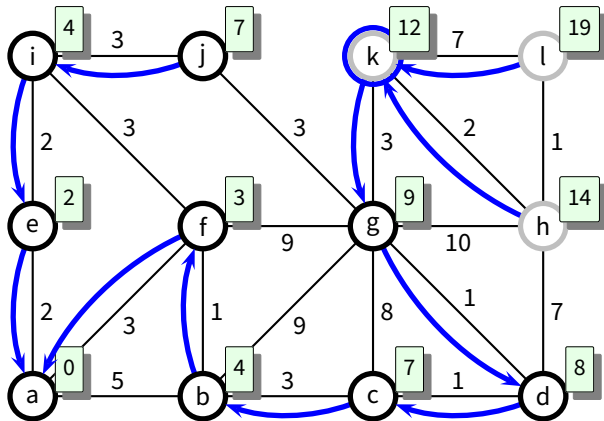
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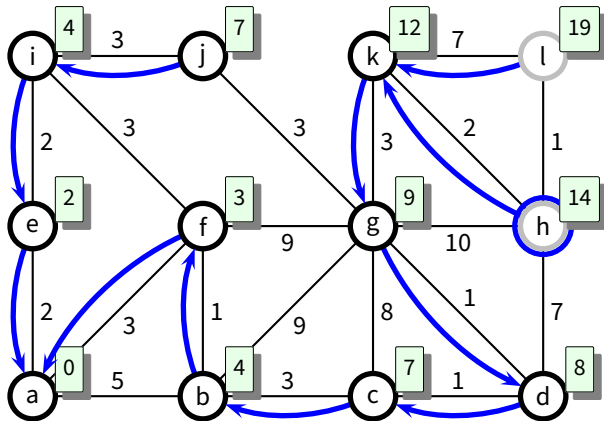
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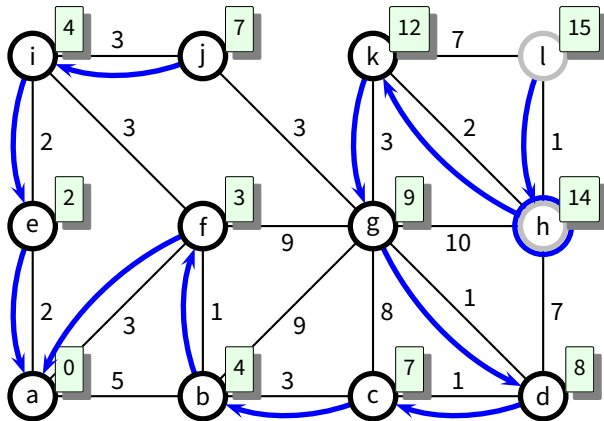
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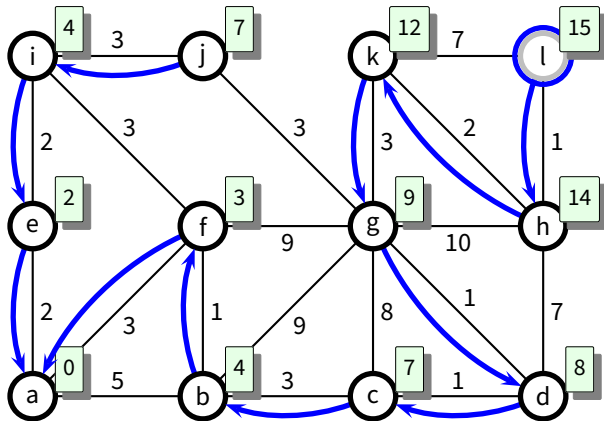
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