# Dijkstra's Algorithm

```
DIJKSTRA(G, w, s)
INIT-SINGLE-SOURCE(G, s)
S = ∅
Q = G.V          // i.e., insert all vertices into Q
while Q ≠ ∅
    u = EXTRACT-MIN(Q)
    S = S ∪ {u}
    for each vertex v ∈ G.Adj[u]
        RELAX(u, v, w)
```

```
INIT-SINGLE-SOURCE(G, s)
for each v ∈ G.V
    v.d = ∞
    v.π = NIL
s.d = 0
```

```
RELAX(u, v, w)
if v.d > u.d + w(u, v)
    v.d = u.d + w(u, v)
    v.π = u
```