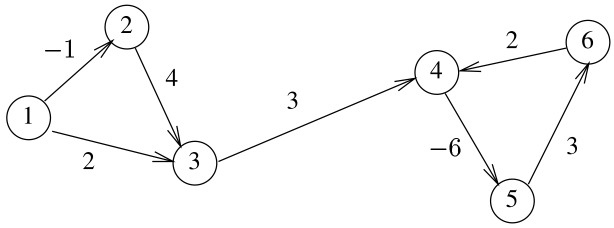
Example:



1 Basic Algorithm

1. DIST$[s] := 0$;
2. **for all** $v \in V \backslash \{s\}$ **do** DIST$[v] := \infty$ **endfor**;
3. **while** $\exists$ edge $e = (u, v) \in E$ with DIST$[v] >$ DIST$[u] + c(u, v)$ **do**
4.   choose such an edge e;
5.   DIST$[v] :=$ DIST$[u] + c(e)$;
6. **endwhile;**

2 Refined Algorithm

1. DIST$[s] := 0$;
2. **for all** $v \in V \backslash \{s\}$ **do** DIST$[v] := \infty$ **endfor**;
3. $U := \{s\}$;
4. **while** $U \neq \emptyset$ **do**
5.   choose and delete an arbitrary $u \in U$;
6.   **for all** $(u, v) \in E$ **do**
7.   **if** DIST$[v] >$ DIST$[u] + c(u, v)$ **then**
8.   DIST$[v] :=$ DIST$[u] + c(u, v)$;
9. $U := U \cup \{v\}$;
10.   **endif;**
11.   **endfor;**
12. **endwhile;**

3 Dijkstra's Algorithm

ITEM: ARRAY$[1 \ldots n]$ of $\uparrow$ *pq*_item;

$PQ := \mathit{Create}();$

$\text{ITEM}[s] := \mathit{Insert}(PQ, 0, s);$

$\text{DIST}[s] := 0;$

for all $v \in V \setminus \{s\}$ **do**

$\quad \text{ITEM}[v] := \mathit{Insert}(PQ, \infty, v);$

$\quad \text{DIST}[v] := \infty;$

endfor;

while $\neg \mathit{Empty}(PQ)$ **do**

$\quad (d, u) := \mathit{DeleteMin}(PQ);$

$\quad$ **for all** $(u, v) \in E$ **do**

$\qquad$ **if** $\text{DIST}[v] > \text{DIST}[u] + c(u, v)$ **then**

$\qquad\quad \text{DIST}[v] := \text{DIST}[u] + c(u, v);$

$\qquad\quad \mathit{DecreaseKey}(PQ, \text{ITEM}[v]\uparrow, \text{DIST}[v]);$

$\qquad$ **endif**;

$\quad$ **endfor**;

endwhile;