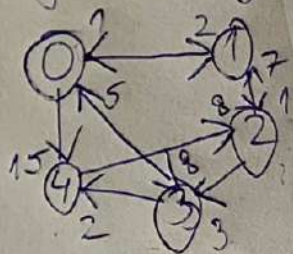


Dijkstra's algorithm (backwards)

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911



$s=0, t=4$

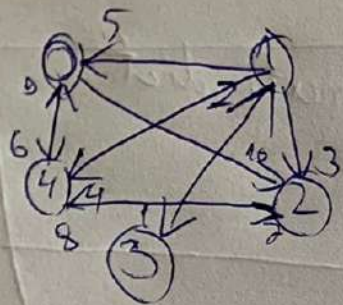
it. 1.2
 $y=4$ $dist[0]=15$

	x	y	distance: dict	queue: priority q.	next: dict
initialization			$\begin{matrix} 4 \\ 0 \end{matrix}$	$\leftarrow (4, 0) \leftarrow$	
iteration 1	4		$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 15 & & & & 0 \end{matrix}$	$\leftarrow \leftarrow$ $\leftarrow (3, 2) (0, 15) \leftarrow$	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 4 & & & 4 & \end{matrix}$
iteration 1.1		3			
iteration 2	3		$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 10 & & & & 0 \end{matrix}$	$\leftarrow (0, 10) (0, 15) \leftarrow$ $\leftarrow (0, 10) (0, 15) \leftarrow$	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 3 & & & 4 & \end{matrix}$
iteration 2.1		0			
iteration 2.2		2	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 10 & & 5 & 2 & 0 \end{matrix}$	$\leftarrow (2, 5) (0, 10) (0, 15) \leftarrow$	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 3 & & 3 & 4 & \end{matrix}$
iteration 3	2		$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 10 & & 5 & 2 & 0 \end{matrix}$	$\leftarrow (0, 10) (0, 15) \leftarrow$	
iteration 3.1		4	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 10 & & 5 & 2 & 0 \end{matrix}$		
		1	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 10 & 6 & 5 & 2 & 0 \end{matrix}$	$\leftarrow (1, 6) (0, 10) (0, 15) \leftarrow$	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 3 & 2 & 3 & 4 & \end{matrix}$
iteration 4	1			$\leftarrow (0, 10) (0, 15) \leftarrow$	
		0	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 8 & 6 & 5 & 2 & 0 \end{matrix}$	$\leftarrow (0, 8) (0, 10) (0, 15) \leftarrow$	$\begin{matrix} 0 & 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 & \end{matrix}$
iteration 5	0			$X=0=D=(s, t)$	

Min. cost walk from $s=0$ to $t=4$ is $dist[0]=8$ and the path is given by the next dict:

$s=0$, $next[0]=1$, $next[1]=2$, $next[2]=3$, $next[3]=4=t$
 $0 \rightarrow 1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

(no path)



$D=0 \quad t=3$

	X	Y	distance, dict	queue: priority q.	next: dict
initialization			<div> <div>0 1 2 3 4</div> <div> <div></div> <div></div> <div></div> <div>0</div> <div></div> </div> </div>	<div> <div>(3,0)</div> <div></div> </div>	<div> <div>0 1 2 3 4</div> <div> <div></div> <div></div> <div></div> <div></div> <div></div> </div> </div>
iteration 1	3			<div> <div></div> <div></div> </div>	
iteration 1.1		1	<div> <div>0 1 2 3 4</div> <div> <div></div> <div>1</div> <div>0</div> <div></div> <div></div> </div> </div>	<div> <div>(1,1)</div> <div></div> </div>	<div> <div>0 1 2 3 4</div> <div> <div>3</div> <div></div> <div></div> <div></div> <div></div> </div> </div>
iteration 2	1		— " —	<div> <div></div> <div></div> </div>	— " —
iteration 2.1		3	<div> <div>max distance</div> <div>dict</div> </div>		

⇒ There is no path between 0 and 3

