National Polytechnic Institute
Superior School of Computer Sciences

Computer Networks.

Dijkstra's Algorithm.

Hernandez Martinez Carlos David.
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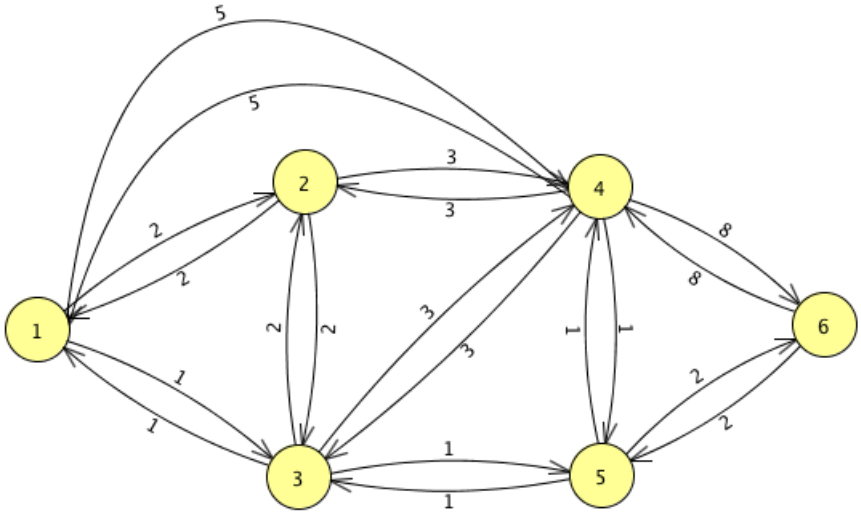
Contents

1 Dijkstra's algorithm:

Using the Dijkstra's algorithm I'll find the Routing table for the Node 1 of the following graph:



M	D2	PATH	D3	PATH	D4	PATH	D5	PATH	D6	PATH
1	2	1-2	1	1-3	5	1-4	INF	1-5	INF	1-6
1-3	2	1-2			4	1-3-4	2	1-3-5	INF	1-6
1-3-5	2	1-2			3	1-3-5-4			4	1-3-5-6
1-3-5-2					3	1-3-5-4			4	1-3-5-6
1-3-5-2-4									4	1-3-5-6
1-3-5-2-4-6										

1.1 Routing Table:

Destination	Metric	Next Hop
1	0	-
2	2	2
3	1	3
4	3	3
5	2	3
6	4	3

2 Metrics:

$$
\begin{aligned}
&For D_3 \;=\; 1: \\
&D_2 \;=\; min\,[\,D_2,\; D_3 \;+\; d_{2-3}\,] \;=\; min\,[\,2,\; 1 \;+\; 2\,] \;=\; 2 \\
&D_4 \;=\; min\,[\,D_4,\; D_3 \;+\; d_{4-3}\,] \;=\; min\,[\,5,\; 1 \;+\; 3\,] \;=\; 4 \\
&D_5 \;=\; min\,[\,D_5,\; D_3 \;+\; d_{5-3}\,] \;=\; min\,[\,INF,\; 1 \;+\; 1\,] \;=\; 2 \\
&D_6 \;=\; min\,[\,D_6,\; D_3 \;+\; d_{6-3}\,] \;=\; min\,[\,INF,\; 1 \;+\; INF\,] \;=\; INF
\end{aligned}
$$

$$
\begin{aligned}
&For D_5 \;=\; 2: \\
&D_2 \;=\; min\,[\,D_2,\; D_5 \;+\; d_{2-5}\,] \;=\; min\,[\,2,\; 2 \;+\; INF\,] \;=\; 2 \\
&D_4 \;=\; min\,[\,D_4,\; D_5 \;+\; d_{4-5}\,] \;=\; min\,[\,4,\; 2 \;+\; 1\,] \;=\; 3 \\
&D_6 \;=\; min\,[\,D_6,\; D_5 \;+\; d_{6-5}\,] \;=\; min\,[\,INF,\; 2 \;+\; 2\,] \;=\; 4
\end{aligned}
\tag{1}
$$

$$
\begin{aligned}
&For D_2 \;=\; 2: \\
&D_4 \;=\; min\,[\,D_4,\; D_2 \;+\; d_{4-2}\,] \;=\; min\,[\,3,\; 2 \;+\; 3\,] \;=\; 3 \\
&D_6 \;=\; min\,[\,D_6,\; D_2 \;+\; d_{6-2}\,] \;=\; min\,[\,4,\; 2 \;+\; INF\,] \;=\; 4
\end{aligned}
$$

$$
\begin{aligned}
&For D_4 \;=\; 3: \\
&D_6 \;=\; min\,[\,D_6,\; D_4 \;+\; d_{6-2}\,] \;=\; min\,[\,4,\; 3 \;+\; 8\,] \;=\; 4
\end{aligned}
$$