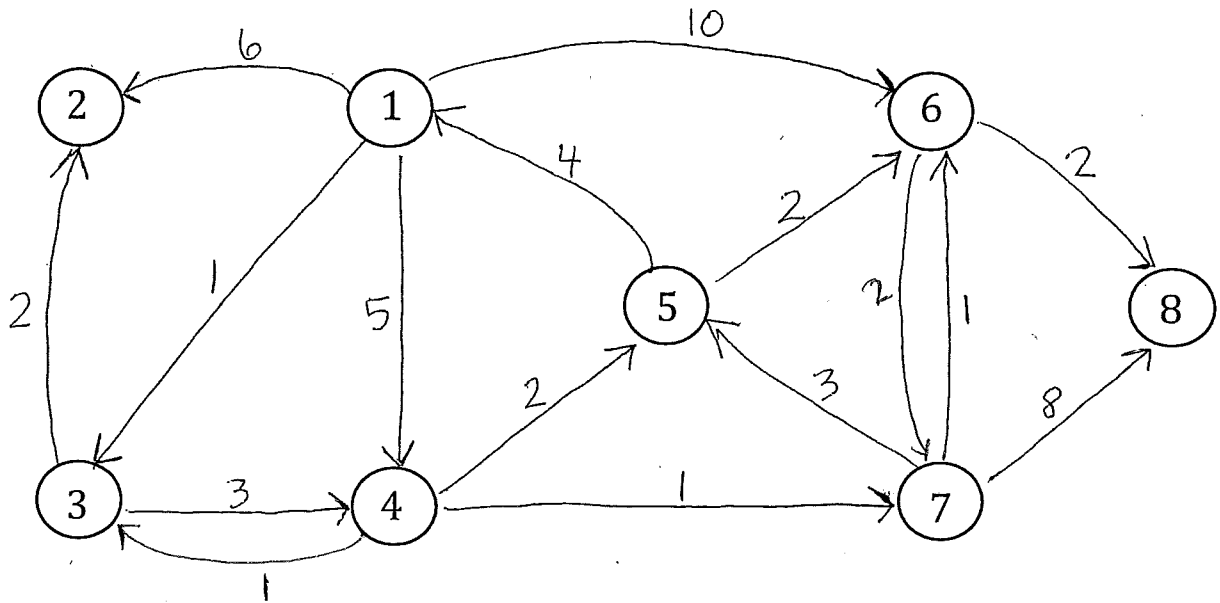


# Practice - Dijkstra algorithm

~~Homework 4~~

~~Use 8 1/2 by 11 inch paper. Always show all work.~~

- Consider the following graph. Assume the nodes are stored in numerical order. Use Dijkstra's algorithm to find the shortest path from node 1 to all other nodes in the graph. Show  $v$ ,  $T[\text{source}][i].\text{dist}$  and  $T[\text{source}][i].\text{path}$  at each state in the algorithm.



- Give two edges that could be removed from the graph so that Dijkstra's algorithm still gives correct answers for the shortest distance from node 1 to all other nodes.

Removed: (1,2), (1,4), (5,1),  
(4,3), (6,7), (7,5),  
(5,6), (1,6), (7,8)

$T[w].\text{dist}$	1	2	3	4	5	6	7	8
	0 <sub>0</sub>	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$	$\infty$
$v=1$		6 <sub>1</sub>	1 <sub>1</sub>	5 <sub>1</sub>	$\infty$	10 <sub>1</sub>	$\infty$	$\infty$
$v=3$		3 <sub>3</sub>		4 <sub>3</sub>	$\infty$	10 <sub>1</sub>	$\infty$	$\infty$
$v=2$				4 <sub>3</sub>	$\infty$	10 <sub>1</sub>	$\infty$	$\infty$
$v=4$					6 <sub>4</sub>	10 <sub>1</sub>	5 <sub>4</sub>	$\infty$
$v=7$					6 <sub>4</sub>	6 <sub>7</sub>		13 <sub>7</sub>
$v=5$						6 <sub>7</sub>		13 <sub>7</sub>
$v=6$								8 <sub>6</sub>
dist	0	3	1	4	6	6	5	8
path	0	3	1	3	4	7	4	6