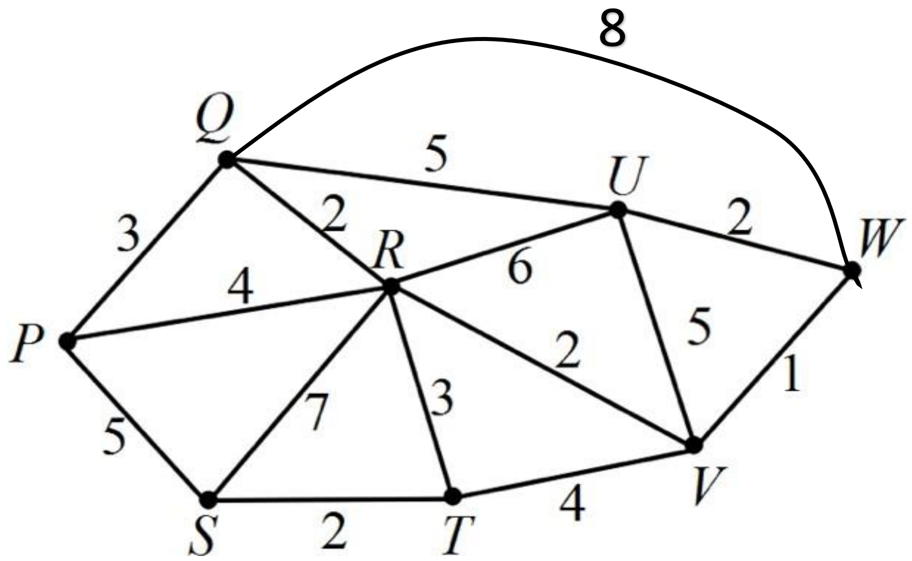
Dijkstra's Algorithm – table representation

There are a few ways of representing the information when using Dijkstra's algorithm.

Remember that Dijkstra's algorithm give us the **shortest path** between two places.

Consider the following network. It shows the travel time between different places



Dijkstra's algorithm will be used to find the shortest time to travel by train between *P* and *W*.

For this representation we have a table.

The vertexes are listed here, leaving out the starting vertex

		Q	R	S	T	U	V	W
Start Vertex	P	3	4	5	X	X	X	X

The X represent that it is not possible to travel directly to T, U, V, W

The shortest from P is to Q, so in the next row we have Q under the P

The vertexes are listed here, leaving out the starting vertex

		Q	R	S	T	U	V	W
Start Vertex	P	3	4	5	X	X	X	X
	Q							

When the table is complete it will look like

The vertexes are listed here, leaving out the starting vertex

		Q	R	S	T	U	V	W
Start Vertex	P	3	4	5	X	X	X	X
	Q	3	4	5	X	8	X	11
	R	3	4	5	7	8	6	11
	S	3	4	5	7	8	6	11
	V	3	4	5	7	8	6	7
	T	3	4	5	7	8	6	7
	W	3	4	5	7	8	6	7

A cell is highlighted when it is the shortest to A of those not yet visited.
In the row

S	3	4	5	7	8	6	11

The 6 is the smallest not yet visited so it gets highlighted and V is the vertex in the next row.

We can use this table to find the shortest path from P to W and the shortest time for travelling between P and W by train.

	Q	R	S	T	U	V	W
P	3	4	5	X	X	X	X
Q	3	4	5	X	8	X	11
R	3	4	5	7	8	6	11
S	3	4	5	7	8	6	11
V	3	4	5	7	8	6	7
T	3	4	5	7	8	6	7
W	3	4	5	7	8	6	7

Start at W.
Travel up until stopped by an X or a bigger number.
We stop in row V, so we travel across to column V
Repeat this up and across process until we get to row P.

The shortest time to travel from P to W is 7 Hours.

The pathway is P – R – V – W