

**Problem 14**

I started with a weighted connected graph.

The weight on edge YB is 8.

I ran a few rounds of Dijkstra's algorithm for finding shortest paths from D to everywhere else.

Here's part of the table I got.

	B	Y
status	unpicked	unpicked
link	Z	Q
dist	10	4

When I started the next round, I ended up picking Y.

(a) Update B.

(b) At this point, what can you conclude about shortest paths between D and B and between D and Y.

**solution 14**

(a)  $\text{dist } Y + YB < ? \text{ dist } B$

$4 + 8 < ? 10$       NO No change.

	B	Y
status	unpicked	picked
link	Z	Q
dist	10	4

(b) Quote the loop invariant.

Shortest distance between D and Y is 4 (permanent conclusion, because Y is picked). Shortest distance between D and B *using picked vertices as intermediaries* is 10 (but that could improve in later rounds as more vertices get picked).