## 1 Exercises

Problem 1. Consider the following edge-weighted digraph:
8
$\begin{array}{lll}15 & 5 & 0.35\end{array}$
540.35
470.37
570.28
$\begin{array}{lll}7 & 5 & 0.28\end{array}$
510.32
040.38
$\begin{array}{lll}0 & 2 & 0.26 \\ 7 & 3 & 0.39\end{array}$
$\begin{array}{lll}7 & 3 & 0.39\end{array}$
130.29
$\begin{array}{lll}2 & 7 & 0.34\end{array}$
$\begin{array}{lll}6 & 2 & 0.40 \\ 3 & 6 & 0.52\end{array}$
360.52
600.58
640.93

Now suppose we fix the source vertex to be vertex 0 and run Dijkstra's algorithm on the above graph.
a. What are the states of the distTo and edgeTo arrays?
b. Is there a path from the source (vertex 0 ) to vertex 6 ? If so, what is it and what is its length?

## 2 Solutions to Exercises

## Solution 1.

| a. v | distTo[v] | edgeTo[v] |  |
| :---: | :---: | :---: | :--- |
|  |  |  |  |
| 0 | 0.00 | null |  |
| 1 | 1.05 | $5->1$ | 0.32 |
| 2 | 0.26 | $0->2$ | 0.26 |
| 3 | 0.99 | $7->3$ | 0.39 |
| 4 | 0.38 | $0->4$ | 0.38 |
| 5 | 0.73 | $4->5$ | 0.35 |
| 6 | 1.51 | $3->6$ | 0.52 |
| 7 | 0.60 | $2->7$ | 0.34 |

b. Yes, the path is $0 \rightarrow 20.26 \quad 2 \rightarrow 70.34 \quad 7 \rightarrow 30.39 \quad 3 \rightarrow 60.52$, and its length is 1.51

