

Assignment 1

Problem:

You are given a digraph $H = (V, E)$, where elements of the vertex set V are 1, 2, 3, 4, 5, and 6. Members of the edge set E are (1, 2), (1, 3), (2, 3), (2, 4), (3, 4), (3, 5), (4, 6), (5, 3), (5, 4), (5, 6), and (6, 4). The lengths of these arcs are $c_{12} = 1, c_{13} = 2, c_{23} = 5, c_{24} = 7, c_{34} = 1, c_{35} = 2, c_{46} = 2, c_{53} = 8, c_{54} = 3, c_{56} = 5$, and $c_{64} = 9$.

Assume that the source-node is node 1. Determine the distance and predecessor vectors, $\mathcal{D} = (d_1, d_2, d_3, d_4, d_5, d_6)$, and $\mathcal{T} = (\tau_1, \tau_2, \tau_3, \tau_4, \tau_5, \tau_6)$ respectively.

Code Dijkstra's algorithm in **any high-level language** you want. You can use either C, or C++, or Java, etc. You can use the pseudo-code given in the handout on *Graph Algorithms*. You are also permitted to use another source (or book) to code this algorithm. However, mention the source of your code. Test your code against the given problem.

You should submit:

- A soft copy of your code.
- A soft copy of the test result (printed output) when you use the above digraph.