

Notes

- i) Math 748 students must provide solutions typeset using \LaTeX . Others may use \LaTeX or write by hand or use any other word processor.
- ii) Late assignments will not be marked and will earn zero credit.
- iii) The worst assignment score will be dropped when calculating final grades.
- iv) Try not to print this assignment.

Problems for Math 448 and Math 748

1. Page 86: 3.3, 3.4, 3.6
2. Page 127: 4.13 (For solution, use Excel solver or open solver)
3. Page 127: 4.14
4. Page 128: 4.19, 4.21, 4.22, 4.24, 4.25
5. Page 129: 4.30, 4.32
6. Answer true/false with proper justification. An algorithm that computes a shortest $s - t$ path in G for any integer edge costs can be used to find a hamiltonian $s - t$ path in G .
7. Let $G = (V, E)$ be a bipartite graph with the generic bipartition of $V = V_1 \cup V_2$ and the source node $s \in V_1$. In Dijkstra's algorithm, if all nodes in V_1 are permanently labeled, can we conclude that the distance labels for all nodes in $V = V_1 \cup V_2$ are the shortest path distances? Justify your answer.

Problems for Math 748 only

8. Let G be a graph with node set $V = \{1, 2, \dots, n\}$. Some of the edges of G may have negative cost but G does't have any negative cycles. We know the shortest path distances from node 1 to all other nodes. Can we use this information to compute shortest paths from node 2 to all other nodes using Dijkstra's algorithm? Justify your answer.
9. Page 129: 4.35, 4.39