Dijkstra’s Algorithm

Concepts & Notation

- Sec. 1.3: incidence matrix $M$, adjacency matrix $A$.
- Sec. 1.4: subgraph $(H \subseteq G)$, spanning subgraph, induced subgraph $G[V']$, edge-induced subgraph $G[E']$.
- Sec. 1.5: degree, maximum degree $\Delta$, minimum degree $\delta$.
- Sec. 1.6: walk, trail, path, connected, disconnected, components $\omega$, distance $d(v, w)$.
- Sec. 1.7: closed walk, cycle, girth, length.
- Sec. 1.8: weighted graph, shortest path problem, Dijkstra’s algorithm.

Organizational Notes

- Daily Homework: $h07$ officially due today.
- Keep reading ahead in our text. We’re into Sec. 1.8 now.
- $h08$, #1.8.1, p.20, is officially due on Friday.
- Solutions for $h06$ posted. $h07$ and after still accepted.
- Everything I’ve received through $h06$ is graded and/or posted.
- Daily Worksheet: send $s08$ worksheet after Lab.
- Take-home Test 1 on Friday, due Monday.

Review

1. (Sec. 1.6) What is the distance between vertices $v$ and $w$ in a graph?

2. (Sec. 1.7) **Claim**: A graph is bipartite if and only if it contains no odd cycle.
Notes

3. Can we turn this proof into a test for whether a graph is bipartite?

4. (Sec. 1.8) What is a *weighted graph*?

5. What is the *shortest path problem*?

6. What is *Dijkstra’s algorithm*?