Before Class:

• Journal Up

1. Easiest Shortest Path

• What are the shortest paths in these graphs?
• Does the shortest path problem exhibit optimal substructure?
• When solving a shortest path, we end up solving a many things
• Unweighted edges
• Breadth-first Search
• Early termination

2. Weighted Edge Paths

• What are we not allowed to have?
• Need depths, need predecessors
• At initialization, dist = ∞, dist[s] = 0, pred = null
• Relax - changes dist and pred
• Bellman-Ford example
• Running time? (VE)
• Can we do better?
• Dijkstra’s example
• Running time?
• Problem with Dijkstra’s?
• Can we do better if we know something about the graph?
• DAG example
• Running time? (V+E)
• Only works in specific cases
• Why are we solving single-source, all destinations?

3. All-Pairs shortest paths

• Use Dijkstra’s —V— times?
• Floyd-Warshall example
• Running time?
• Why is this better?

Next Class:

• Minimum spanning trees
• Evaluations!