Cse332, Worksheet 6: Graphs

1. Using the following graph, execution the following algorithms. When evaluating edges, consider them in alphabetical order:
   1. Breadth-first search: ignore edge weights, start at ‘a’, and write the order visited
   2. Depth-first search: ignore edge weights, start at ‘a’, and write the order visited
   3. Topological sort: ignore edge weights, show work and the resulting order
   4. Dijkstra’s algorithm: start at ‘a’ and show work and order visited
   5. In the previous graph, why would Topological sort fail if an edge from ‘e’ to ‘b’ were added?
   6. Assuming we just want to traverse a graph, in any order, are there cases where Depth-first-search will fail yet Breadth-first-search will succeed (Hint: yes). When?
2. Which of the following above algorithms would you use to do the following (assuming you had the information in graph form):
   1. Verify that you can drive from one point to another on only paved roads.
   2. Hike from point a to point b on Mount Rainier using the hiking trails.
3. Given a graph representing all known species in the animal kingdom, with each the second level being phylum, the 3rd being class, etc., come up with an algorithm to find the distance (in the tree) between 2 species; say, a human and an elephant. Make any (reasonable) assumptions you want about how the graph is stored.