1. **Consider a directed graph G = (V,E) with non-negative edge lengths and two distinct vertices ss and t of V. Let P denote a shortest path from s to t in G. If we add 10 to the length of every edge in the graph, then: [Check all that apply.]**
2. **What is the running time of depth-ﬁrst search, as a function of n and m, if the input graph G=(V,E) is represented by an adjacency matrix (i.e., NOT an adjacency list), where as usual n=|V| and m=|E| ?**
3. **What is the asymptotic running time of the Insert and Extract-Min operations, respectively, for a heap with n objects?**
4. **On adding one extra edge to a directed graph G, the number of strongly connected components...?**
5. **Which of the following statements hold? (As usual n and mm denote the number of vertices and edges, respectively, of a graph.) [Check all that apply.]**
6. **When does a directed graph have a unique topological ordering?**
7. **Suppose you implement the operations Insert and Extract-Min using a sorted array (from biggest to smallest). What is the worst-case running time of Insert and Extract-Min, respectively? (Assume that you have a large enough array to accommodate the Insertions that you face.)**
8. **Which of the following patterns in a computer program suggests that a heap data structure could provide a significant speed-up (check all that apply)?**
9. **Which of the following patterns in a computer program suggests that a hash table could provide a significant speed-up (check all that apply)?**
10. **Which of the following statements about Dijkstra's shortest-path algorithm are true for input graphs that might have some negative edge lengths? [Check all that apply.]**