CS 2050 Introduction to Discrete Mathematics: Algorithms

1. What is the primary difference between an algorithm and a heuristic?

A. An algorithm is a set of instructions for completing a task, while a heuristic is a rule of thumb for completing a task.
B. An algorithm is guaranteed to find a solution to a problem, while a heuristic is not.
C. An algorithm is always faster than a heuristic.

2. Which of the following is an example of a greedy algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

3. What is the time complexity of the Bubble Sort algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

4. What is the space complexity of the Bubble Sort algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

5. Which of the following is an example of a dynamic programming algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

6. What is the time complexity of the Dijkstra's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

7. What is the space complexity of the Dijkstra's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

8. Which of the following is an example of a divide and conquer algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

9. What is the time complexity of the Prim's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

10. What is the space complexity of the Prim's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

11. Which of the following is an example of a graph algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

12. What is the time complexity of the Kruskal's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

13. What is the space complexity of the Kruskal's algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

14. Which of the following is an example of a search algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

15. What is the time complexity of the Binary Search algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

16. What is the space complexity of the Binary Search algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

17. Which of the following is an example of a sorting algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

18. What is the time complexity of the Merge Sort algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

19. What is the space complexity of the Merge Sort algorithm?

A. O(n)
B. O(n^2)
C. O(log n)

20. Which of the following is an example of a computational geometry algorithm?

A. Dijkstra's algorithm
B. Prim's algorithm
C. Kruskal's algorithm

1. B. An algorithm is guaranteed to find a solution to a problem, while a heuristic is not.
2. B. Prim's algorithm
3. B. O(n^2)
4. A. O(n)
5. A. Dijkstra's algorithm
6. A. O(n)
7. A. O(n)
8. B. Prim's algorithm
9. B. O(n^2)
10. B. O(n^2)
11. A. Dijkstra's algorithm
12. C. O(log n)
13. C. O(log n)
14. A. Dijkstra's algorithm
15. C. O(log n)
16. A. O(n)
17. C. Kruskal's algorithm
18. C. O(log n)
19. B. O(n^2)
20. A. Dijkstra's algorithm