CSCI 570 - Fall 2019 - HW 2
Due September 11th

1 Graded Problems

1. Solve Kleinberg and Tardos, **Chapter 2, Exercise 3**.

2. Solve Kleinberg and Tardos, **Chapter 2, Exercise 4**.

3. Solve Kleinberg and Tardos, **Chapter 2, Exercise 5**.

4. Which of the following statements are **true**?

   (a) If f, g, and h are positive increasing functions with f in $O(h)$ and g in $\Omega(h)$, then the function $f + g$ must be in $\Theta(h)$.

   (b) Given a problem with input of size n, a solution with $O(n)$ time complexity always costs less in computing time than a solution with $O(n^2)$ time complexity.

   (c) $F(n) = 4n + \sqrt{3n}$ is both $O(n)$ and $\Theta(n)$.

   (d) For a search starting at node s in graph G, the DFS Tree is never as the same as the BFS tree.

   (e) BFS can be used to find the shortest path between any two nodes in a non-weighted graph.

5. Solve Kleinberg and Tardos, **Chapter 3, Exercise 2**.

2 Practice Problems

1. Reading Assignment: Kleinberg and Tardos, **Chapter 2 and 3**.
2. Solve Kleinberg and Tardos, **Chapter 2, Exercise 6**.

3. Solve Kleinberg and Tardos, **Chapter 3, Exercise 6**.