

CSCI 570 - Spring 2018 - HW 2

Due January 28th

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**.