CS6033 Homework Assignment 13

Do not turn in this assignment.

1. What is an optimal Huffman code for the following set of frequencies?

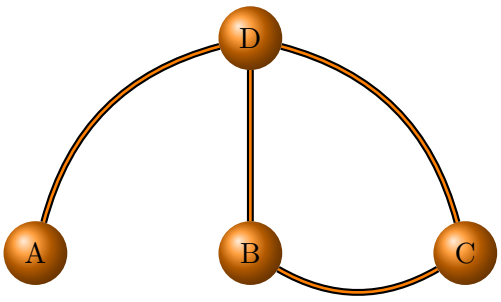
$$a : 3, b : 6, c : 8, d : 2, e : 5, f : 9, g : 13, h : 12$$

2. Design a greedy algorithm for making change consisting of quarters, dimes, nickels, and pennies. Prove your algorithm has the greedy choice property and optimal substructure.

3. After a horrifying road trip with your friend to California. You now need to return home. You vow to study hard in class (and thus get a job) so next time you visit California you will be driving your own car (you were unaware your friend refused to drink coffee). After the horrifying experience on the trip down (you nearly crashed 42 times), you have revised your return plan. On your trip home, you refuse to travel more than 300 miles per day. You have the list of hotel from last time at mile markers $m_1, m_2, \ldots, m_n$. You wish to get home in as few days as possible.

   Design an algorithm and provide run time of your algorithm using big-Oh notation.

4. Does the following graph have a Hamiltonian Cycle? Using the method discussed in class, show how to reduce this graph to an instance of the Traveling Salesman decision problem. Solve the Traveling Salesman decision problem for the instance you created. Using your answer to the Traveling Salesman problem, determine if the original graph had a Hamiltonian Cycle.



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