Homework 6

1 Minimum Spinning Tree

Finish question 1 on `https://www.educoder.net/classrooms/9025/shixun_homework/`.

2 Coin changing

Consider the problem of making change for n cents using the fewest number of coins. Assume that each coin' s value is an integer. We recommend to read the chapter 6 of book *"Introduction to Algorithms" (3rd Edition).*

- **a.** Describe a greedy algorithm to make change consisting of quarters, dimes, nickels and pennies. Please give the pseudocode, and prove that your algorithm yields an optimal solution.
- **b.** Suppose that the available coins are in the denominations that are powers of c, i.e., the denominations are $c^0; c^1; \cdots; c^k$ for some integers $c > 1$ and $k \geq 1$. Show that the greedy algorithm always yields an optimal solution.
- **c.** Give a set of coin denominations for which the greedy algorithm does not yield an optimal solution. Your set should include a penny so that there is a solution for every value of n.

3 Due

1. Due is Nov. 1st, 23:59.
2. Question 2 is a writing assignment, submit a PDF on the canvas.