**Data Structure & Algorithm 2: Assignment 2**

***Instruction****: Write programs, preferably Python, complete with comments. In your report (handwritten), explain your designs, write the pseudocodes & the running time analyses. Print out the programs, attach them with your report. Thank you.*

***Submit both hardcopy & softcopy.***

***Submit hardcopy (handwritten report & printed-out programs): 9 April 2018 in class.***

***Submit softcopy (snapshot of handwritten report & attach the programs): 8 April 2018 midnight in Google Classroom.***

Problem:

There are *N* identically looking coins one of which is fake. Assume that the fake coin is known to be lighter than the genuine ones. There is a balance scale but there are no weights; the scale can tell whether two sets of coins weigh the same and, if not, which of the two sets is heavier (but not by how much).

1. Design a **brute-force algorithm** (write a program, preferably Python) for detecting the fake coin.
2. Design a **decrease and conquer algorithm** (write a program, preferably Python) for detecting the fake coin.
3. Analyse the running time for both algorithms.