COMP 4030/6030 -- Assignment 1

Due: 9/7/2017 before class

Given **N** coins that look identical and should be the same weights. However, one is a fake coin, which is lighter than the others. Your task is to design algorithms (written in Python) to find the fake coin. For practical purposes, you can use the same procedure of generating coins regular coins having weights of 2 and the fake coin having weight of 1.

1. (40 Points) Design an iterative algorithm to find the fake coin. To make it simple, your algorithm should return the value of the fake coin.
2. (30 Points) Design a recursive algorithm to find the fake coin by dividing N coins in two groups and weight them. To make it simple, your algorithm should return the value of the fake coin.
3. (30 Points) Design a recursive algorithm to find the fake coin by dividing N coins in three groups and weight them. To make it simple, your algorithm should return the value of the fake coin.
4. (10 Points) Bonus points are given for submissions that contain test cases that show each submitted algorithm is correct.

These algorithms should be written in Python. Each of the three algorithms should be a separate function in Python.

You can discuss with your classmates, but the code must be your own.

**Turn in instructions:**

* The name your solution file should be the same as your UID, plus a .py extension. For example, if your UID is jsmith (i.e. your email is [jsmith@memphis.edu)](mailto:jsmith@memphis.edu)), then your solution file should be **jsmith.py**.
* In the file, put your full name, COMP 4030 or COMP 6030, and Assignment 1.
* Send your solution to the TA (Quang Tran, [qmtran@memphis.edu)](mailto:qmtran@memphis.edu)) with the subject line “**COMP 4030 Assignment 1**”.