Note: For the programming test, you can use either python, c++, or scala.

**Problem 1: Expected Winnings**

1. Play a dice game. The dice has 6 faces with number *1* to *6.* You are given chance to roll a dice *3* times. Each time you roll, you can either take the number showing as dollars, or roll again. What is your expected winnings.
2. Instead of a dice, give a list of numbers range from *1* to *N*. You are given chance to randomly choose a number from this list *M* times. Each time you choose, you can either take the number showing as dollars, or choose again.

Write a function *expected\_winnings(N, M)*, which returns the expected winnings, given *N* and *M*.

**Problem 2: Simple Cycle with Max Accumulated Value**

You are given the data *data\_Problem2.csv.* This data contains transactions between different nodes. In the file each row means a transaction with a VALUE from FROM\_NODE to TO\_NODE. The transaction has direction.

This task is the following:

Find all the simple cycles in this data. Here a simple cycle is defined as A→ B → C → D → A. For each cycle, compute the accumulated transaction value associated with this cycle. E.g. transaction value (A→ B) + transaction value (B→ C) + transaction value (C→ D) + transaction value (D→ A).

Return the cycle that has the max accumulated transaction value among all simple cycles, and its accumulated transaction value.