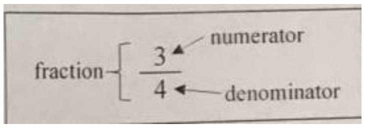
P9

The Problem



You are given a list L of fractions and an integer k_1. Find the first fraction in L whose denominator divides K_1. Let that fraction be n_i/d_i. Then divide k_1 by the denominator d_i and multiply by the numerator n_i and obtain a new integer $k_2 = (k_1 \text{ x } d_i) \times n_i$. Repeat the process for k_2 and keep on going like this either till you get an integer k_p that is not divisible by any denominator in L or till you reach k_{50}.

Example: Let $k_1 = 20$ and L = 1/2, 2/5, 3/4 . This leads to $k_2 = (20 \div 2) \text{ x } 1 = 10$, $k_3 = (10 \div 2) \text{ x } 1 = 5$, $k_4 = (5 \div 5) \text{ x } 2 = 2$, and finally $k_5 = (2 \div 2) \text{ x } 1 = 1$. The final integer $k_5 = 1$ is not divisible by any of the denominators 2, 5 or 4 in L. So we stop.

Develop a Python program to compute the final integer (either k_p or k_{50}), when the starting integer k_1 and the list L are given. The input is a file containing a starting integer and a list of fractions on each line (see format below). The output should be a list of final integers for each starting integer and fraction. The output should be displayed on screen and also written to a file "Output.txt".

Special requirement: You must define at least 2 functions and use them in your code.

Format:

Input : name of input file (the input file contains a starting integer and a fraction list on each line. The starting integer and the fraction list are separated by "|" and the fractions are separated by comma ",".)

Output : Display on screen and write to the output file 'Output.txt' the final integer for each starting integer and fraction list in the input file. Each result should be on a separate line.

Sample :

Case 1

Input : test_data1.txt

Content : 5 | 1/2, 2/5, ¾

7 | 1/5, 10/7, 3/2

Output : Output.txt and on screen

Content : 1

3

Case 2

Input : tet_data2.txt

Content : 10 | 1/2, 2/5

35 | 1/2, 3/4, 2/5

Output : Output.txt and on screen

Content : 1

7