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In [1]: import pandas as pd

def gcd(a:int, b:int) -> int:
    """
    Calculates greatest common divisor of 2 numbers
    """

    if (a == 0):
        return b
    return gcd(b % a, a)

def calculate_jacobi_symbol(m:int, n:int) -> int:
    """
    Calculates Jacobi symbol for 2 given numbers
    """

    if n < 0 or not n % 2:
        raise ValueError("n should be an odd positive integer")
    if m < 0 or m > n:
        m = m % n
    if not m:
        return int(n == 1)
    if n == 1 or m == 1:
        return 1
    if gcd(m, n) != 1:
        return 0

    j = 1
    if m < 0:
        m = -m
        if n % 4 == 3:
            j = -j
    while m != 0:
        while m % 2 == 0 and m > 0:
            m >>= 1
            if n % 8 in [3, 5]:
                j = -j
        m, n = n, m
        if m % 4 == 3 and n % 4 == 3:
            j = -j
        m %= n
    if n != 1:
        j = 0
    return j

data = pd.read_csv('ieeja.txt', header=None)
data.columns = ['m']
prime_list = data['m'].values.tolist()
a = None

for b in prime_list:
    if not a:
        a = b
        continue

    jacobi_symbol = calculate_jacobi_symbol(a, b)
    print("Jakobi symbol for numbers {a} and {b} is: {jacobi_symbol}".format(a=a,
b=b, jacobi_symbol=jacobi_symbol))
    a = b

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Jakobi symbol for numbers 3 and 5 is: -1
Jakobi symbol for numbers 5 and 7 is: -1
Jakobi symbol for numbers 7 and 11 is: -1
Jakobi symbol for numbers 11 and 13 is: -1
Jakobi symbol for numbers 13 and 17 is: 1
Jakobi symbol for numbers 17 and 19 is: 1
Jakobi symbol for numbers 19 and 2019 is: -1

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