PROBLEM I.5: FIBONACCI SEQUENCE

ROSIE KEY

1. How Cassini's Identity was Determined

A program was created to simulate the Fibonacci sequence at a length N given by user input. However, the first two terms of the sequence are inputted by the user. An empty list called *myList* is created, the first two terms are added to the list, and a for loop runs and adds the next terms up to length N. After the first for loop runs, a separate for loop runs through the terms of the now saved sequence and, using an if statement, determines if Cassini's identity applies. By searching through the actual terms of the saved sequence, the if statement takes the square of the current term minus the product of the previous and next terms and sees if it equals -1 raised to the current term's index minus one.

2. Cassini's Identity Test

When F_0 does not equal 0 and F_1 does not equal 1, Cassini's identity does not apply. However, whenever F_0 equals 0 and F_1 equals c, the following equation similar to Cassini's identity is returned:

$$F_n^2 - F_{n+1}F_{n-1} = (-c^2)^{n-1}.$$

Date: February 2019.