Module 5

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Fibonacci Sequence

It is a sequence in which the nth element of the sequence is the sum of the 2 preceding elements. The formula for the elements of the sequence would be:

$$F_n = F_{n-1} + F_{n-2}$$

The sequence is as follows:

[0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, ……..]

The Iterative function

For this function, it first creates a ArrayList to store the elements of the sequence. Then It prompts the user to enter the number of elements that they want the sequence to have, the input is stored in a scanner object which is used in the loop which adds elements to the ArrayList till the desired number of elements is reached. The list if then printed to display all the elements of the sequence.

Recursive function

After the user is asked to enter the number of elements for the sequence, the input is stored in a scanner object. A loop is called upon next which has the parameters to stop after the desired number of elements has been reached. The loop calls on a recursive function which gives the output based on the position of the element in the sequence which returns the sum of the previous 2 elements.

Timer

Both files have used 2 objects: one to store the time at which the execution began and another to store the time at which it ended. The difference is printed out after the sequence, giving us the time it took for the code to execute.