Fibonacci sequence Circuit

PC/CP220 Project Phase I

Kevin Yejoon Lee
210872060
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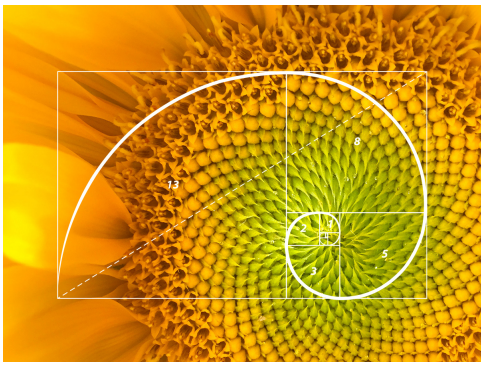
Description

They are specific numbers that we see in nature all the time, sometimes called *nature's code*. Together they are called the Fibonacci sequence.



The idea is simple: the next number is equal to the last two numbers in the sequence. If you look in nature these numbers appear everywhere. Bananas will contain three seed sections, apples five, in fact, chances are that no matter the plant you are looking at it will have 3,5,8,13 ~ pedals or seeds sections. (pine cones, snail shells, broccoli, pineapples, etc)

In nature these numbers represent the most efficient way to pack as many seeds as possible.

Inputs

The **Fibonacci sequence Circuit** will have 3 inputs, a_0 to a_2 which represent the binary representation of the number to be indexed from the fibonacci sequence. The input representing 1 will represent the first number in the sequence. The maximum decimal number these bits can represent is 7.

Outputs

The **Fibonacci sequence Circuit** will have 4 outputs b_0 to b_3 which represent the binary presentation of the number outputted at that index, the index of 3 will give an output of 2 according to the sequence. The maximum decimal number these bits can represent is 15.

Identical Output case

Table below shows two cases where output is identical

Input Decimal	$a_2\,a_1a_0$	Output	$b_3b_2b_1b_0$
1	001	1	0001
2	010	1	0001

Final Truth Table

Table below gives a summary of the circuit's behavior.

Input Decimal	$a_2\,a_1a_0$	Output	$b_3b_2b_1b_0$
0	000	0	0000
1	001	1	0001
2	010	1	0001
3	011	2	0010
4	100	3	0011
5	101	5	0101
6	110	8	1000
7	111	13	1101