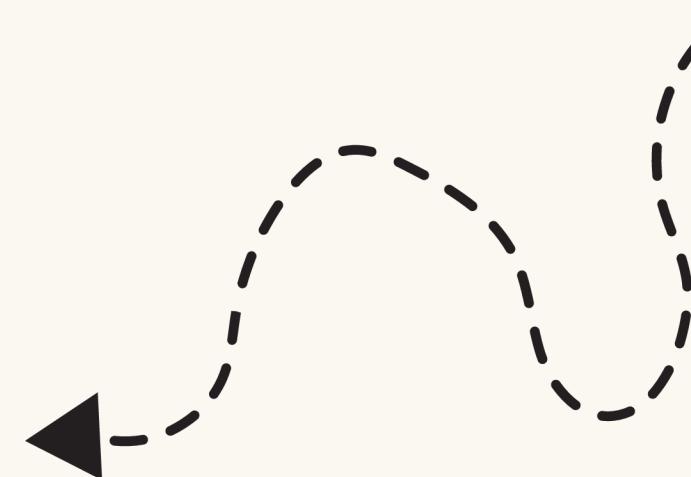
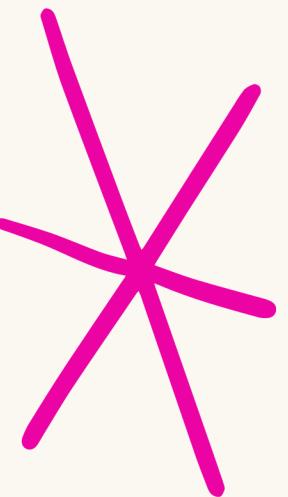


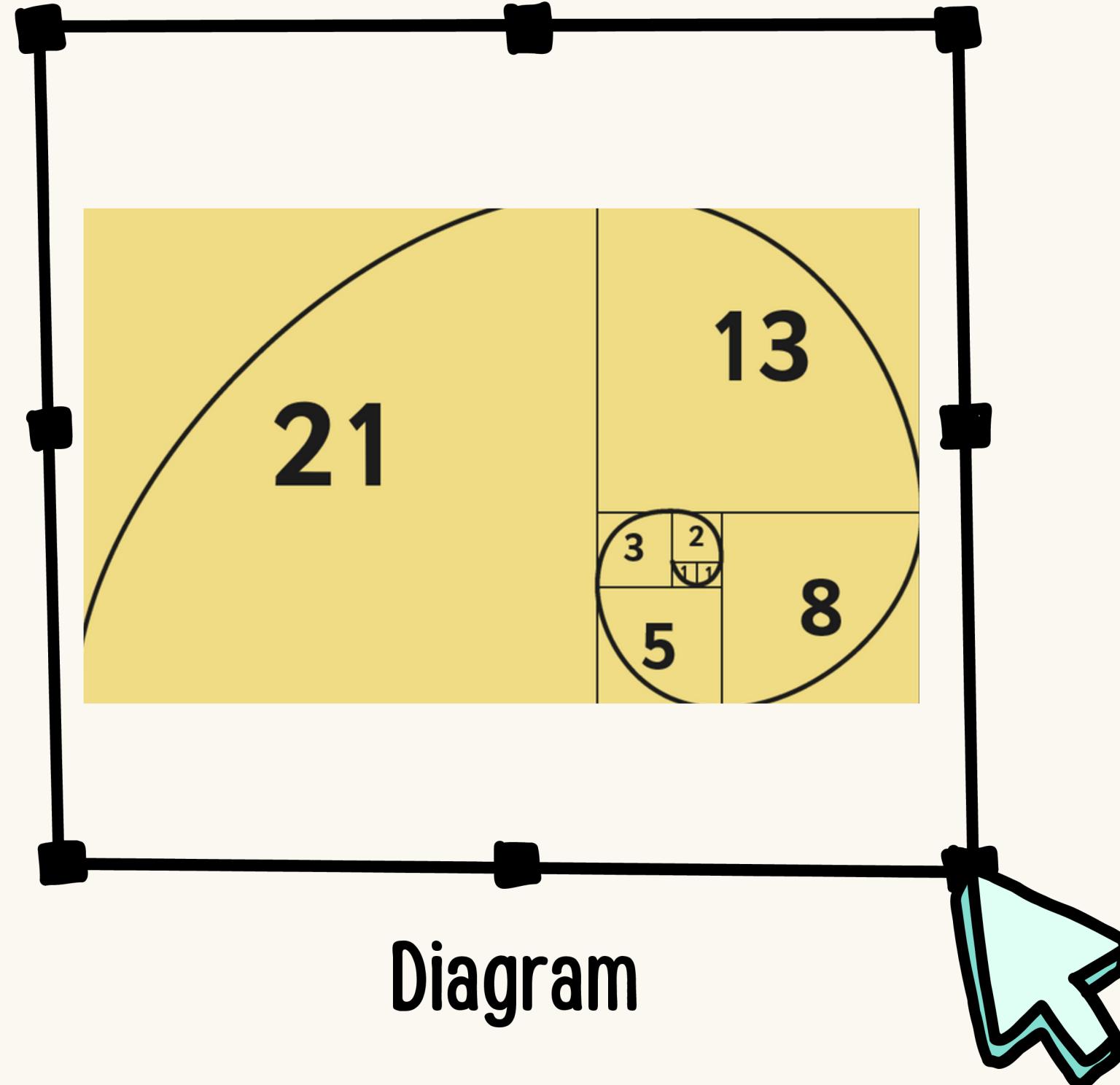
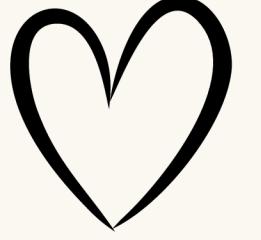
Fibonacci SEQUENCE



By Ahmed Afzal



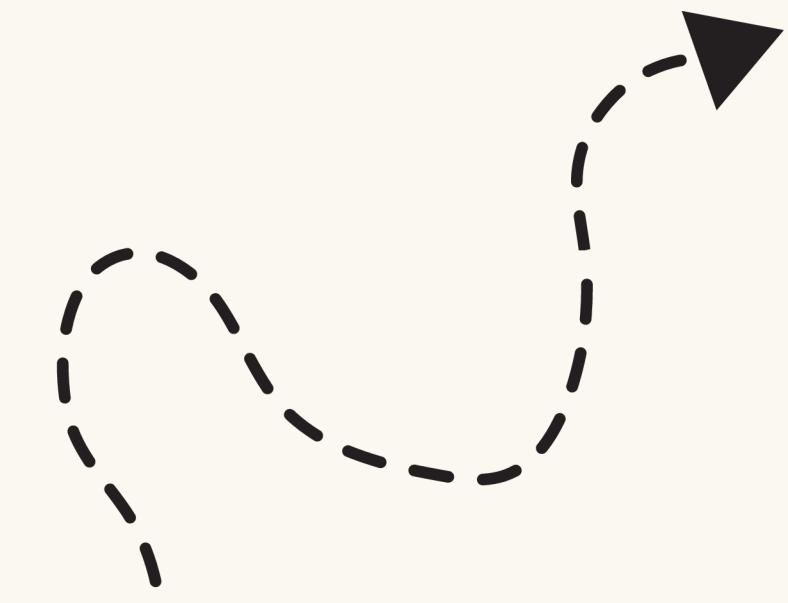
By Ahmed Afzal



Definition

It is a series of numbers in which each number is the sum of the two preceding numbers. The numbers in the Fibonacci series are called Fibonacci numbers.

Example: 0,1,1,2,3,5,8,13,21 and so on...



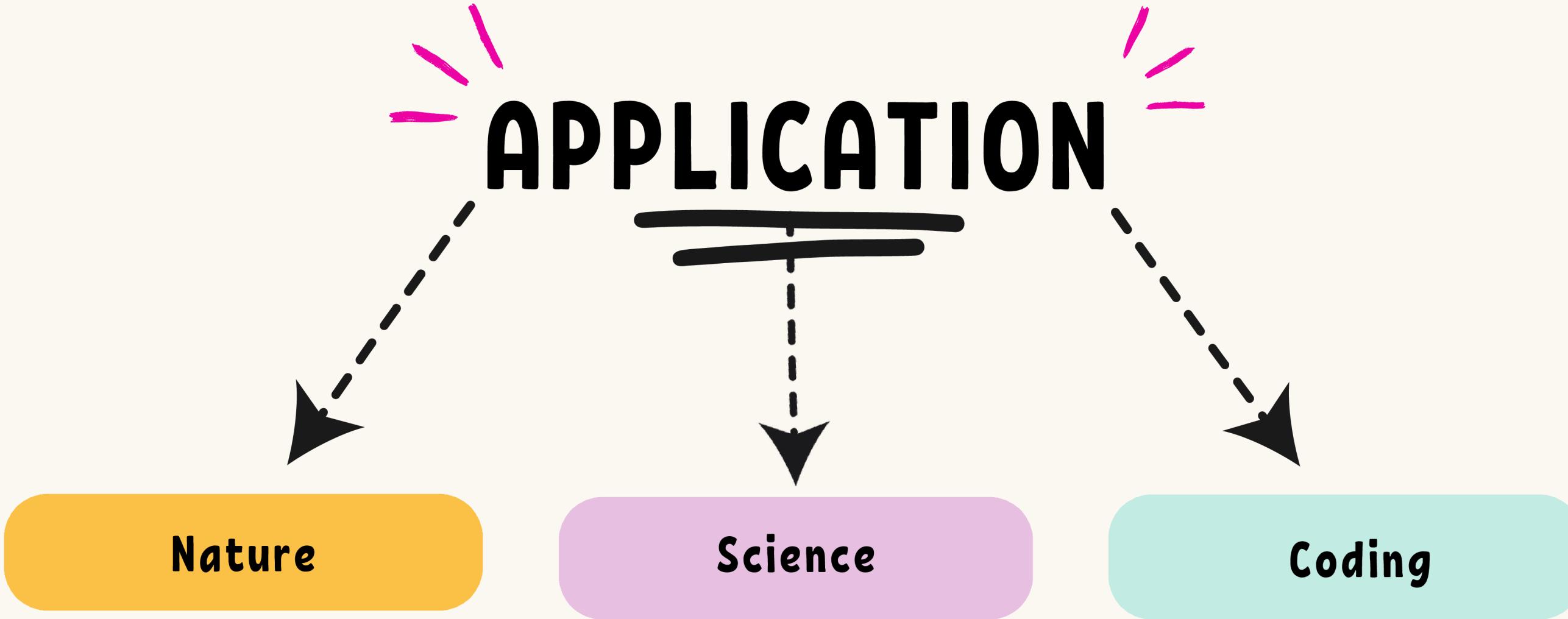
DISCOVERY

This series was discovered by an Italian mathematician, initially known as Leonardo of Pisa. Later, he was given the name Fibonacci(meaning son of Bonacci) by historians. This series was named after him.

FORMULA: $F_N = F_{N-1} + F_{N-2}$, WHERE $N > 1$

N	TERMS	$F(N-1)$	$F(N-2)$	$F_N = F_{N-1} + F_{N-2}$, WHERE $N > 1$
0	1st	-	-	$F_0=0$
1	2nd	$F_0=0$	-	$F_1=1$
2	3rd	$F_1=1$	$F_0=0$	$F_2=0+1=1$
3	4th	$F_2=1$	$F_1=1$	$F_3=1+1=2$
4	5th	$F_3=2$	$F_2=1$	$F_4=2+1=3$
5	6th	$F_4=3$	$F_3=2$	$F_5=3+2=5$
6	7th	$F_5=5$	$F_4=3$	$F_6=5+3=8$

APPLICATION



A central bold black text "APPLICATION" is positioned above three colored rounded rectangles. A dashed arrow points from the top left towards the first rectangle, which is yellow and contains the word "Nature". A dashed arrow points from the bottom center towards the second rectangle, which is pink and contains the word "Science". A dashed arrow points from the top right towards the third rectangle, which is teal and contains the word "Coding". Each arrow has a black arrowhead pointing downwards.

Nature

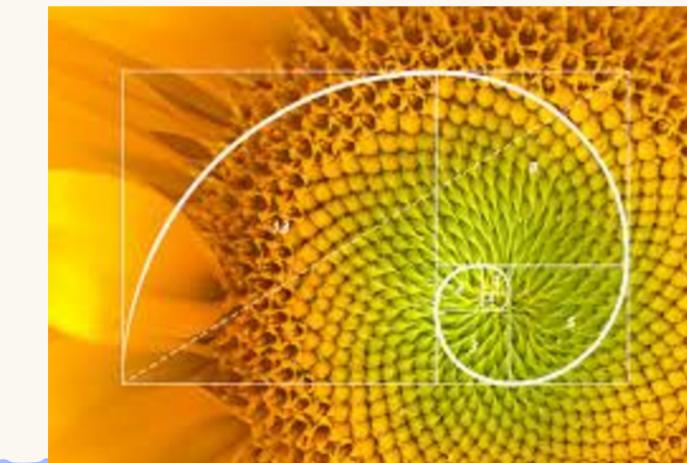
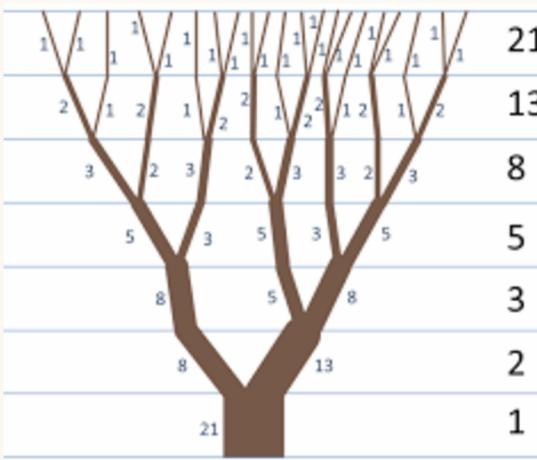
Science

Coding

APPLICATION

Nature :

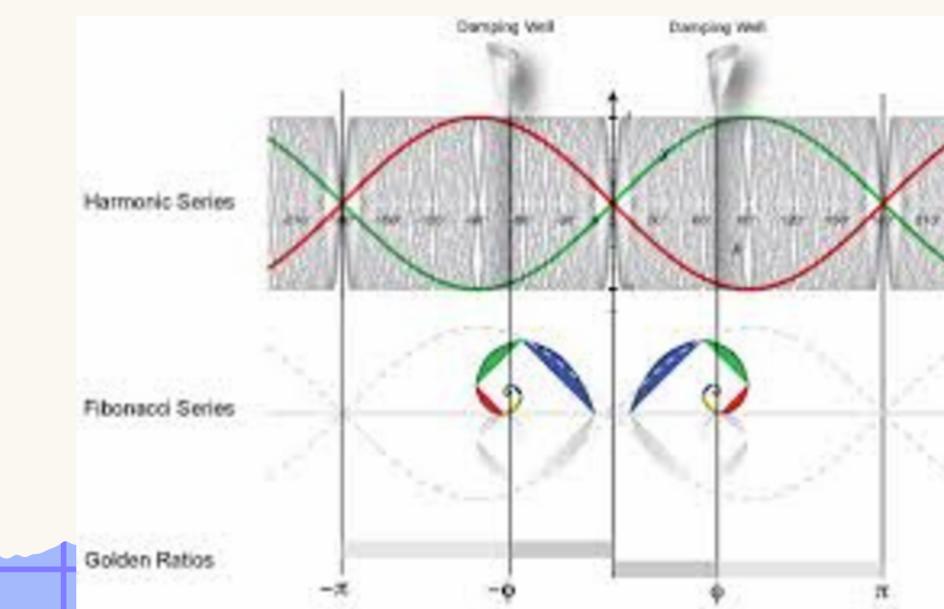
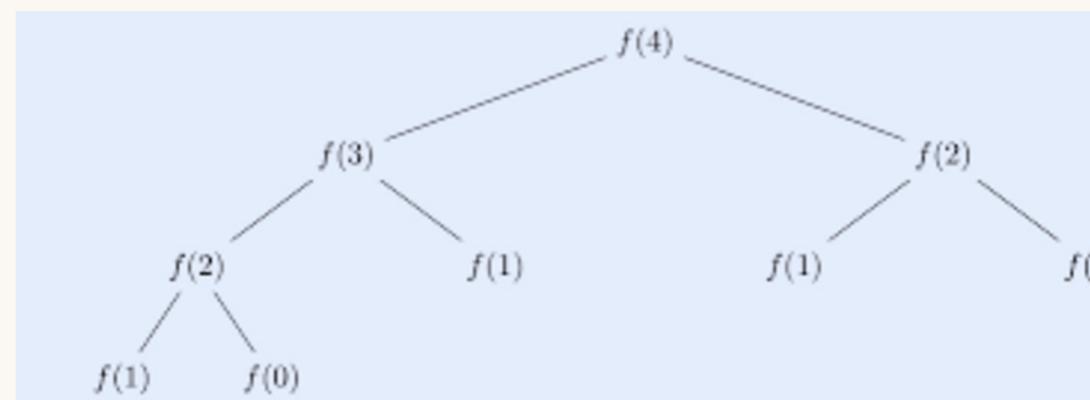
Use to determine the branching of trees, the arrangement of leaves on a stem, the flowering of artichokes, the pattern of snail's shell and the spiral arrangement of seeds in a sunflower.



APPLICATION

Science :

In science, it is used in data structures like Fibonacci heaps in computer science to improve algorithm efficiency. In physics, Fibonacci patterns are observed in wave propagation and quantum models, aiding in understanding natural patterns and particle behavior.



APPLICATION

Coding :

In coding, the Fibonacci sequence is often used to teach recursion and dynamic programming due to its simple recursive definition. It helps optimize algorithms for problems like the knapsack or matrix chain multiplication. Additionally, Fibonacci heaps, a type of priority queue, improve efficiency in graph algorithms like Dijkstra's shortest path.

