Presentation

Topic : Fibonacci sequences

You must be wondering what is fibonacci sequence?

The Fibonacci sequence is a famous mathematical pattern where each number is the sum of the two preceding ones, often starting with 0 and 1. It has widespread applications in nature, art, and computer science.

Explanation in easy words :

The **Fibonacci sequence** is a pattern of numbers where each number is the sum of the two numbers before it. You start with 0 and 1, and then keep adding the last two numbers to get the next one. For example, you start with 0 and 1, add them to get 1, then add 1 and 1 to get 2, then 1 and 2 to get 3, and so on.

In simple terms, you can think of it like this: each new number in the sequence is made by combining the two numbers just before it.

Some questions :

Is it necessary that the series start with 0 and 1 ?

It's not strictly necessary for the Fibonacci sequence to start with 0 and 1, although that's the most common version. Some variations start with different numbers, like 1 and 1, or any other two numbers you choose. The key idea is that **each number is the sum of the two preceding numbers**, regardless of the starting point.

For example:

- Starting with 1 and 1:
  Sequence: 1, 1, 2, 3, 5, 8, 13, ...
- Starting with 2 and 3:
  Sequence: 2, 3, 5, 8, 13, 21, 34, ...

The pattern remains the same: every new number is the sum of the two numbers before it.

Question :

If the series does not repeat like when the a number is not formed by the addition of the previous one is it fibonacci sequence ?

The defining feature of a Fibonacci sequence is that **every** number (after the first two) is the sum of the previous two numbers. If the sequence breaks this rule at any point, it no longer follows the Fibonacci pattern.

For example:

- A valid Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, ...
  - Here, each number is the sum of the two before it.
- An invalid sequence: 0, 1, 1, 2, 4, 5, 9, 13, ...
  - The number 4 is not the sum of 2 and 1 (which should be 3), so this is not a Fibonacci sequence.

How fibonacci sequence is related to Computer science ?

Fibonacci has a strong relationship with computer science in various areas, especially algorithms and data structures .Here's how the Fibonacci sequence is applied:

1. **Recursive Algorithms**
2. **Dynamic Programming**
3. **Data Structures**
4. **Computer Graphics and Nature-Inspired Algorithms**
5. **Sorting Algorithms and Tree Structures**

These connections make Fibonacci a fundamental concept in computer science, both in theory and practical applications.