The Fibonacci numbers are important in many aspects of mathematics, computing and are often found in nature

$$F(n) = \begin{cases} 0, & \textit{if } n = 0; \\ 1, & \textit{if } n = 1; \\ F(n-1) + F(n-2) & \textit{if } n > 1 \end{cases}$$

The Fibonacci numbers are also intimately connected with the golden ratio, and are typically computed using recursion

A better way to compute **The Fibonacci numbers** is done using **eigenvalues and eigenvectors**

```
def fib(n):
    lambda1 = (1 + sqrt(5))/2
    lambda2 = (1 - sqrt(5))/2
    return (lambda1**n - lambda2**n) / sqrt(5)
def fib_approx(n)
    # for practical range, percent error < 10^-6
    return 1.618034**n / sqrt(5)
```

Figure 1: Bla