

Calculating Fibonacci Numbers

What are Fibonacci Numbers?

Fibonacci (Leonardo Bonacci) was an Italian mathematician who published a book in 1202 called "Liber Abaci". In the book he discussed the growth of (idealised) rabbit populations and he proposed a sequence to model those populations as follows:

1, 1, 2, 3, 5, 8, 13, 21, 34, ...

Where each number in the sequence is the sum of the two previous numbers, so to put it in more formal terms, for any number N: $Fib(N) = Fib(N - 1) + Fib(N - 2)$
In other words, any Fibonacci number can be calculated as the sum of the two previous numbers, so $Fib(6) = Fib(5) + Fib(4)$, which is $8 = 5 + 3$.

To figure out the number that the user wants to count to; we'll ask the user and save that in a variable called `Position` and we'll take one away from `Position` each time we are in the loop until we reach 1. Our program will start by setting two variables `Fib1` and `Fib2` to 1 and 0, and each time around the loop we calculate the Fibonacci number, `FibNumber`, by adding the two variables together. To calculate the next number in the sequence, we put the value of `Fib1` into `Fib2`, and the value of `FibNumber` into `Fib1`. The next time in the loop when we add `Fib1` and `Fib2` we will get the next element in the sequence:

Position	5	4	3	2	1
Fib2	0	1	1	2	3
Fib1	1	1	2	3	5
FibNumber	1	2	3	5	End Loop

So the code is as follows:

```

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# PROGRAM FibonacciNumbers:
Position = int(input("Please input value:"))
Fib1 = 1
Fib2 = 0
FibNumber = 1

while (Position >= 1):
    FibNumber = Fib2 + Fib1
    Fib1 = Fib2
    Fib2 = FibNumber
    Position = Position - 1
# EndWhile;
print(FibNumber)

#END.

```

So, the output we will get is the Fibonacci number that is in the position input.

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