Top-down & Bottom-up

郭至軒（KuoE0）

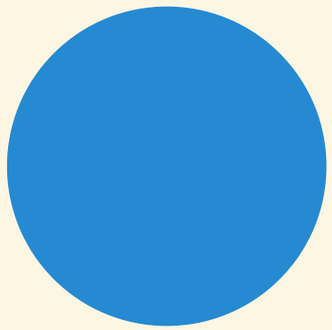
KuoE0.tw@gmail.com
KuoE0.ch

Attribution-ShareAlike 3.0 Unported (CC BY-SA 3.0)

Latest update: Feb 27, 2013

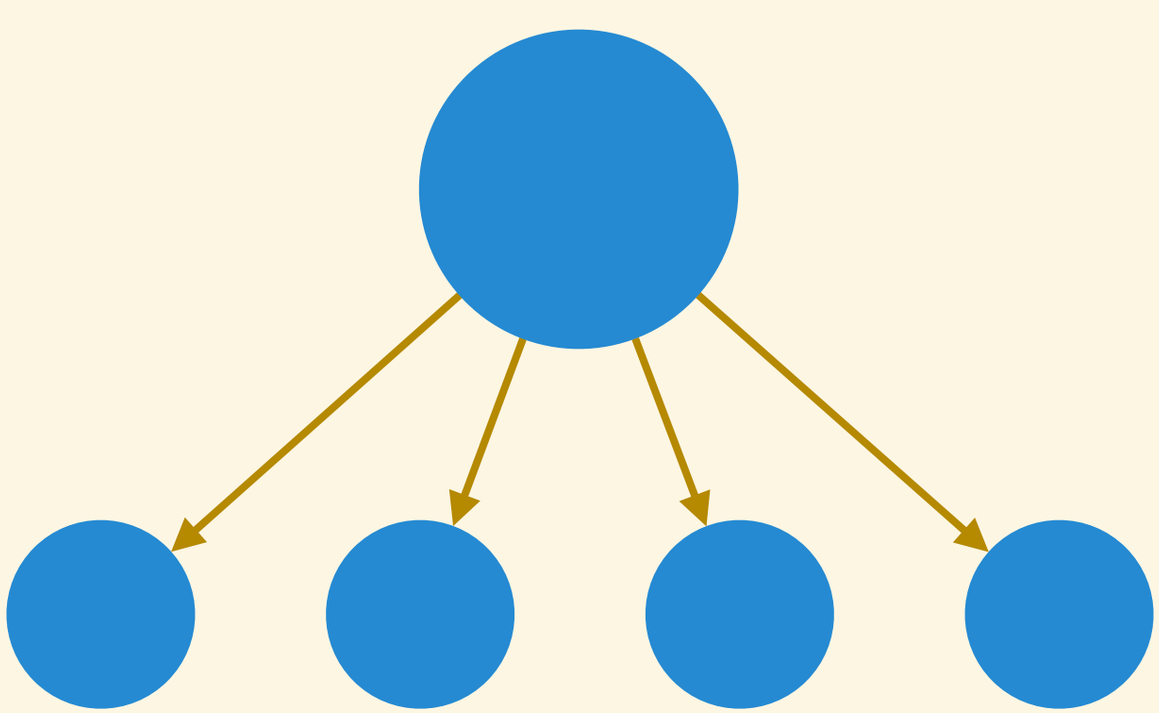
Top-down

將大問題化為小問題，再回溯求解。



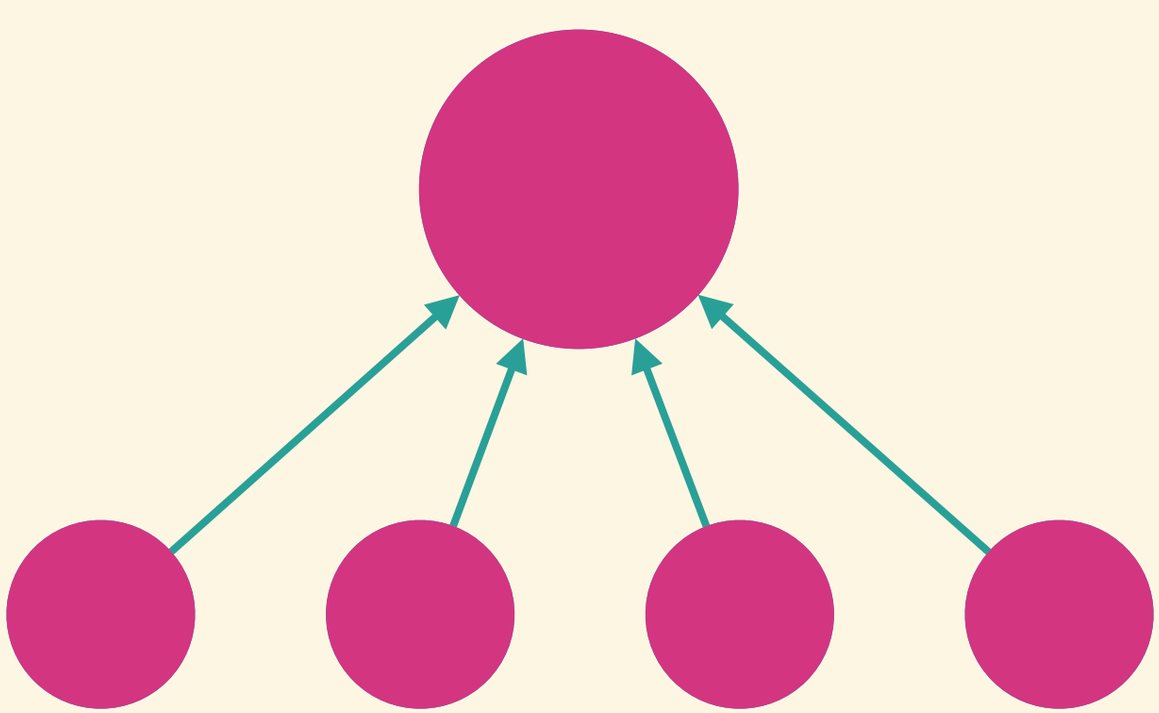
Top-down

將大問題化為小問題，再回溯求解。



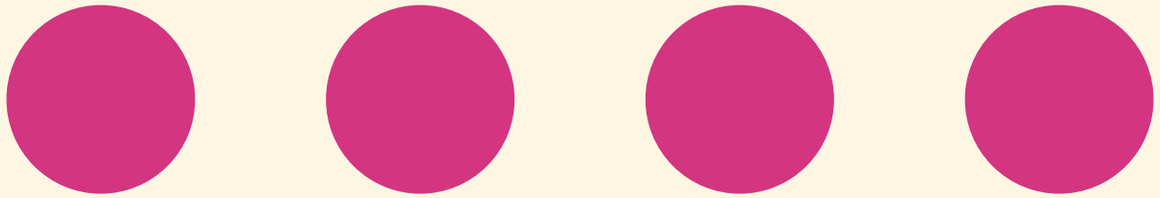
Top-down

將大問題化為小問題，再回溯求解。



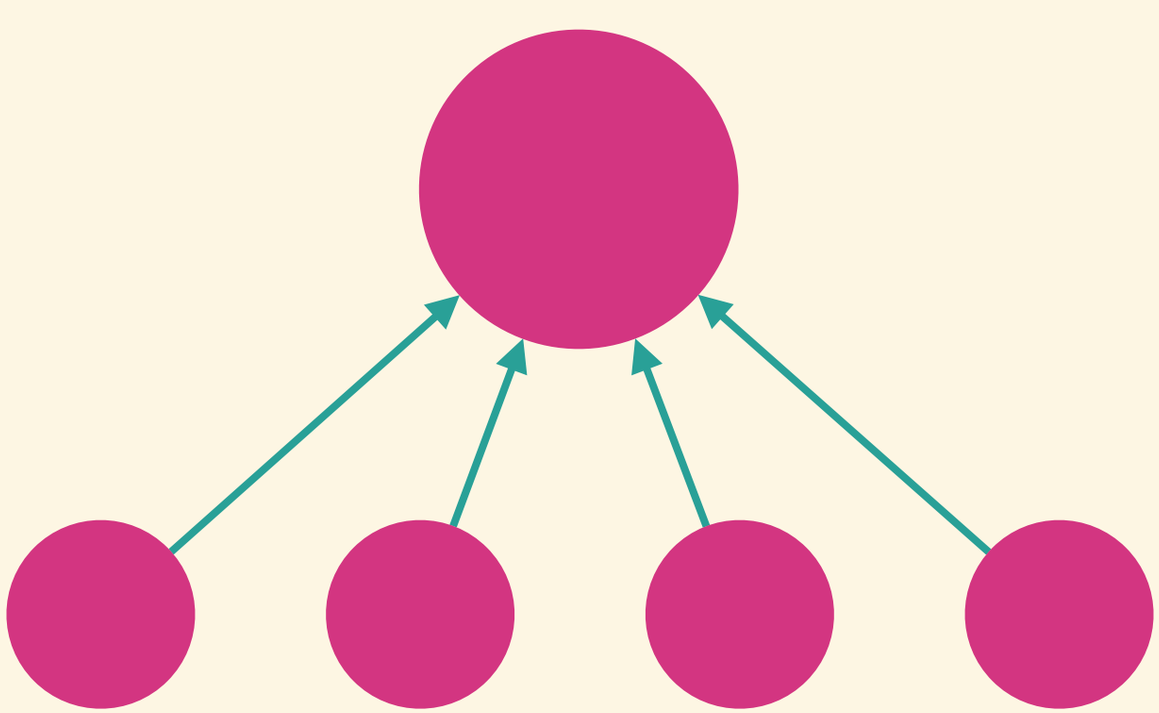
Bottom-up

由已知解決小問題，逐步推移至大問題。



Bottom-up

由已知解決小問題，逐步推移至大問題。



Recursion

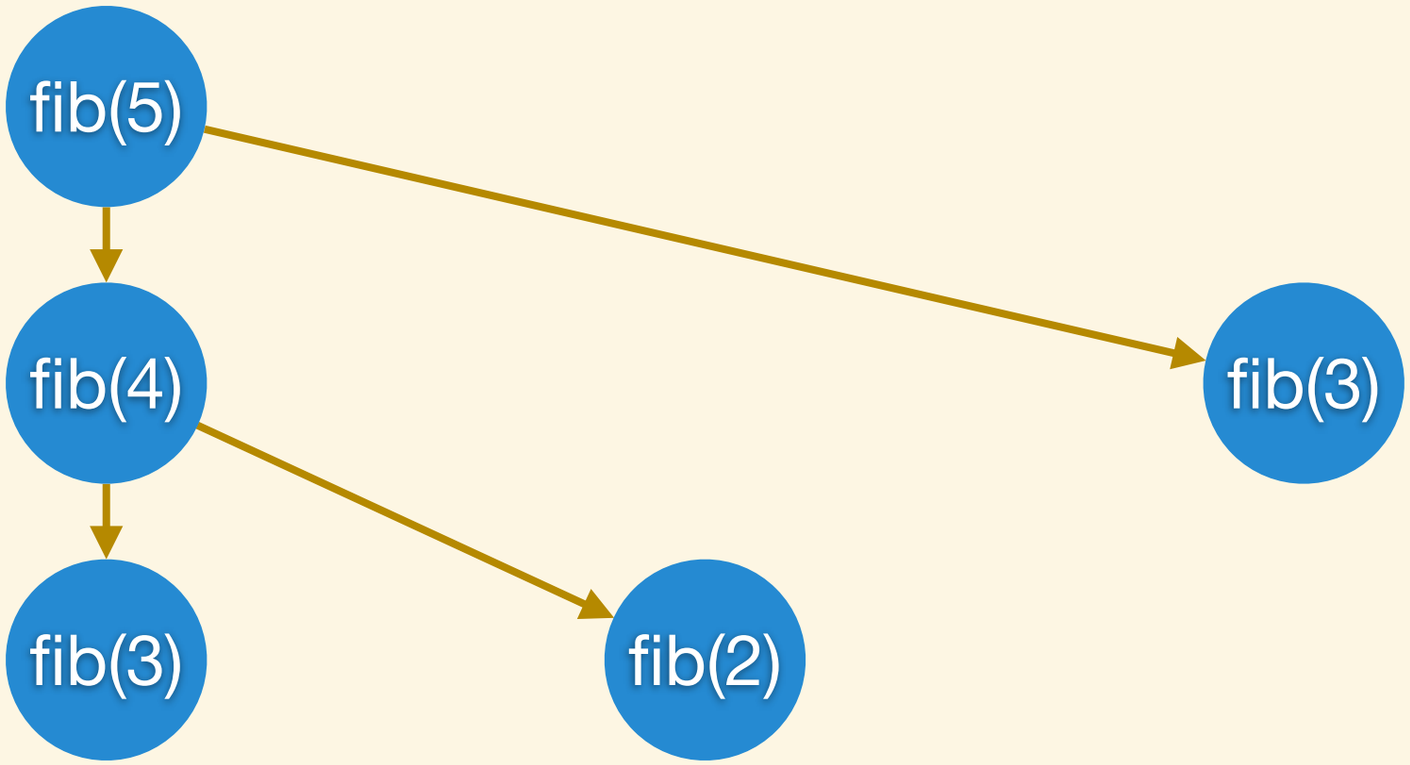
利用同樣的方法不斷的細分問題或逼近答案。

易有太極，是生兩儀。兩儀生四象，四象生八卦。《易傳》

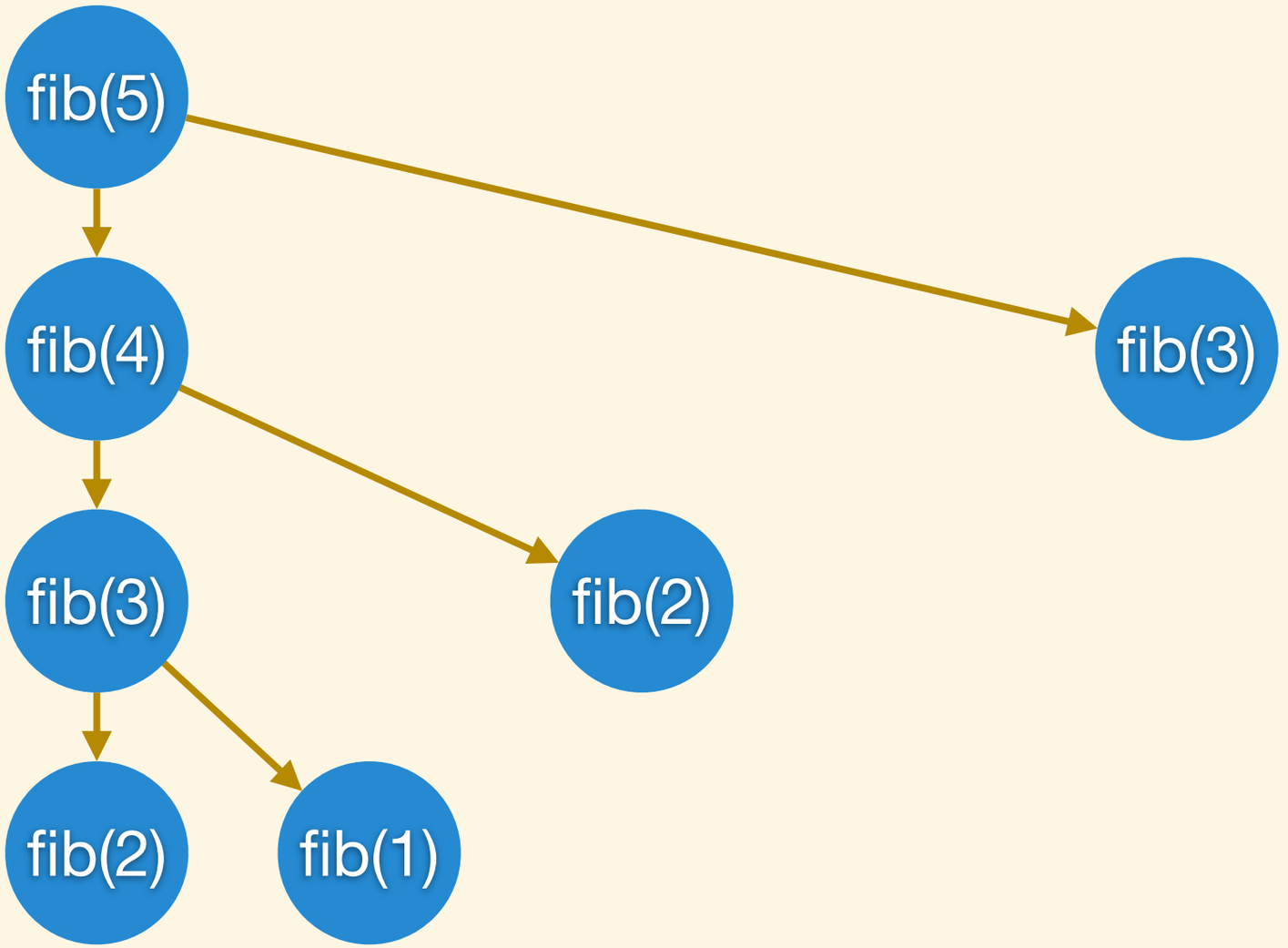
Fibonacci Sequence

Fibonacci Sequence

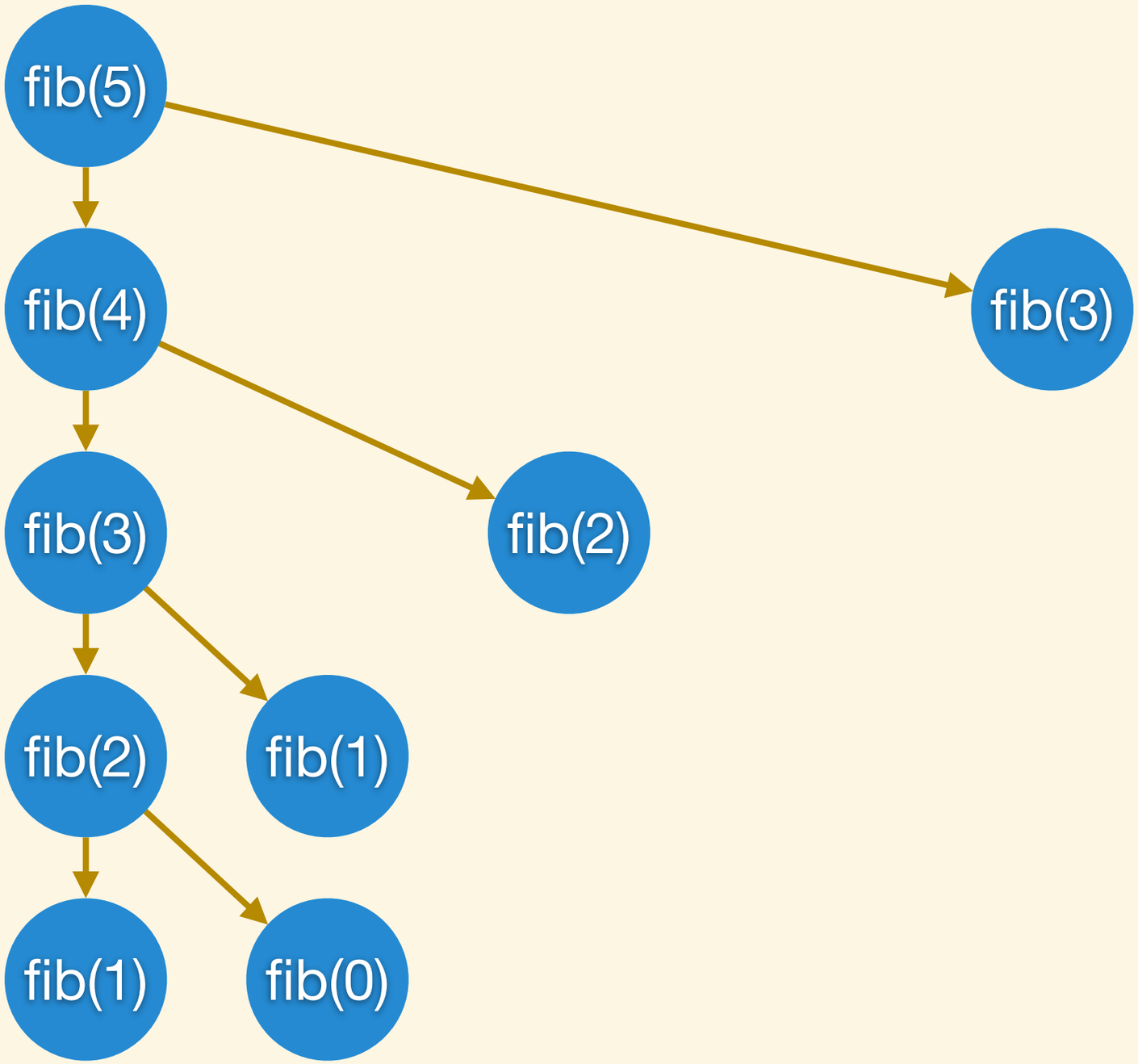
Fibonacci Sequence



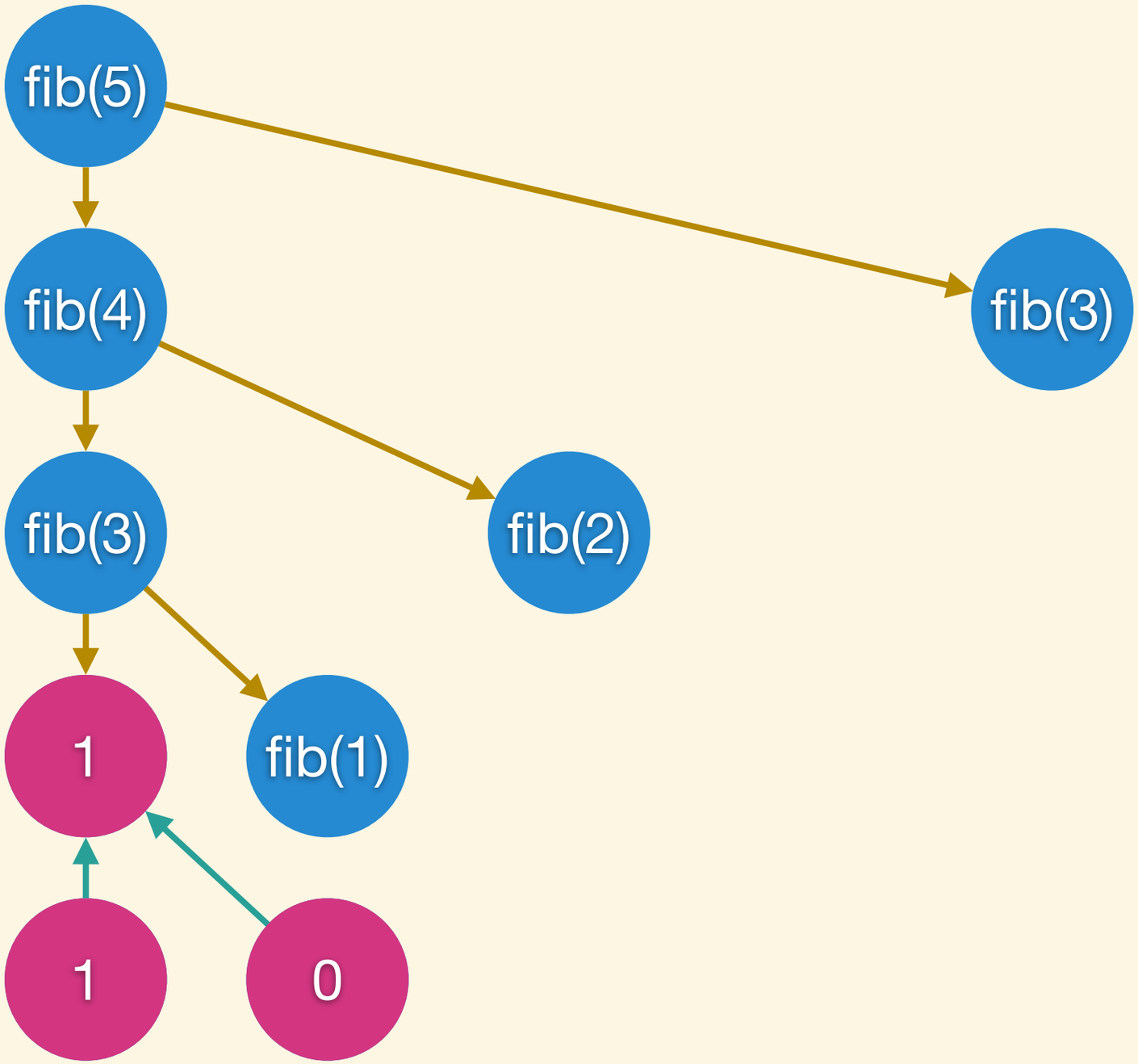
Fibonacci Sequence



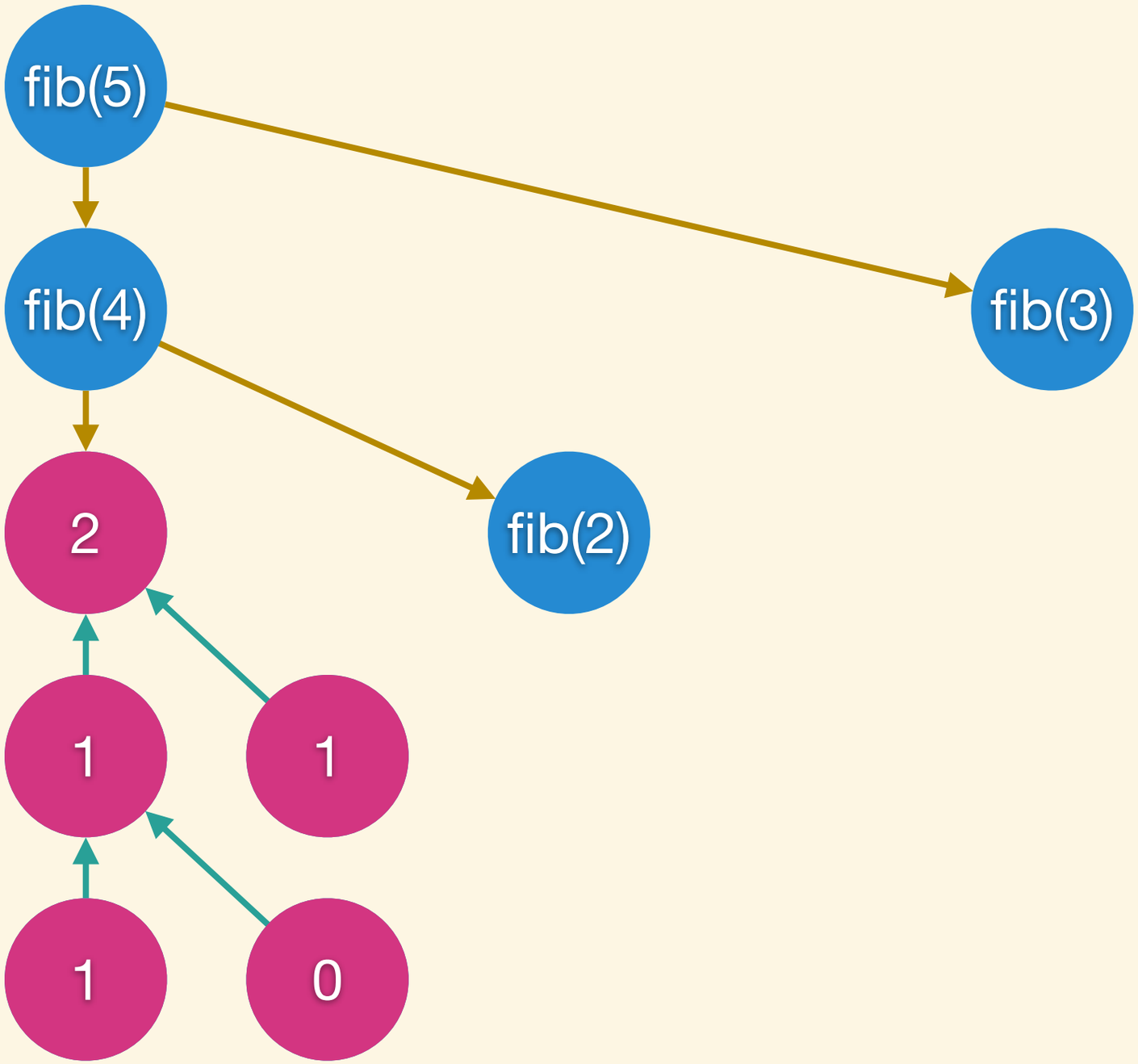
Fibonacci Sequence



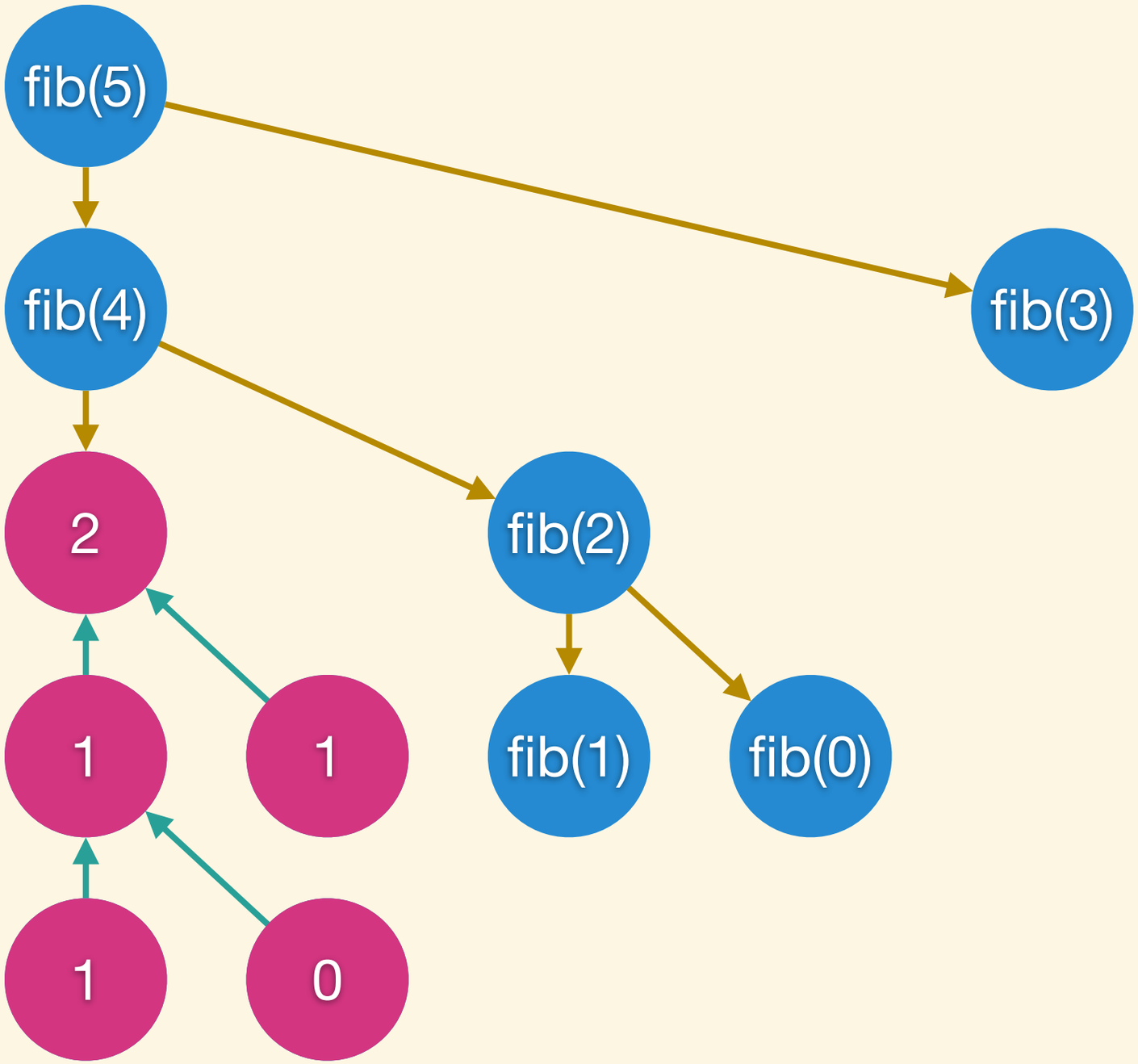
Fibonacci Sequence



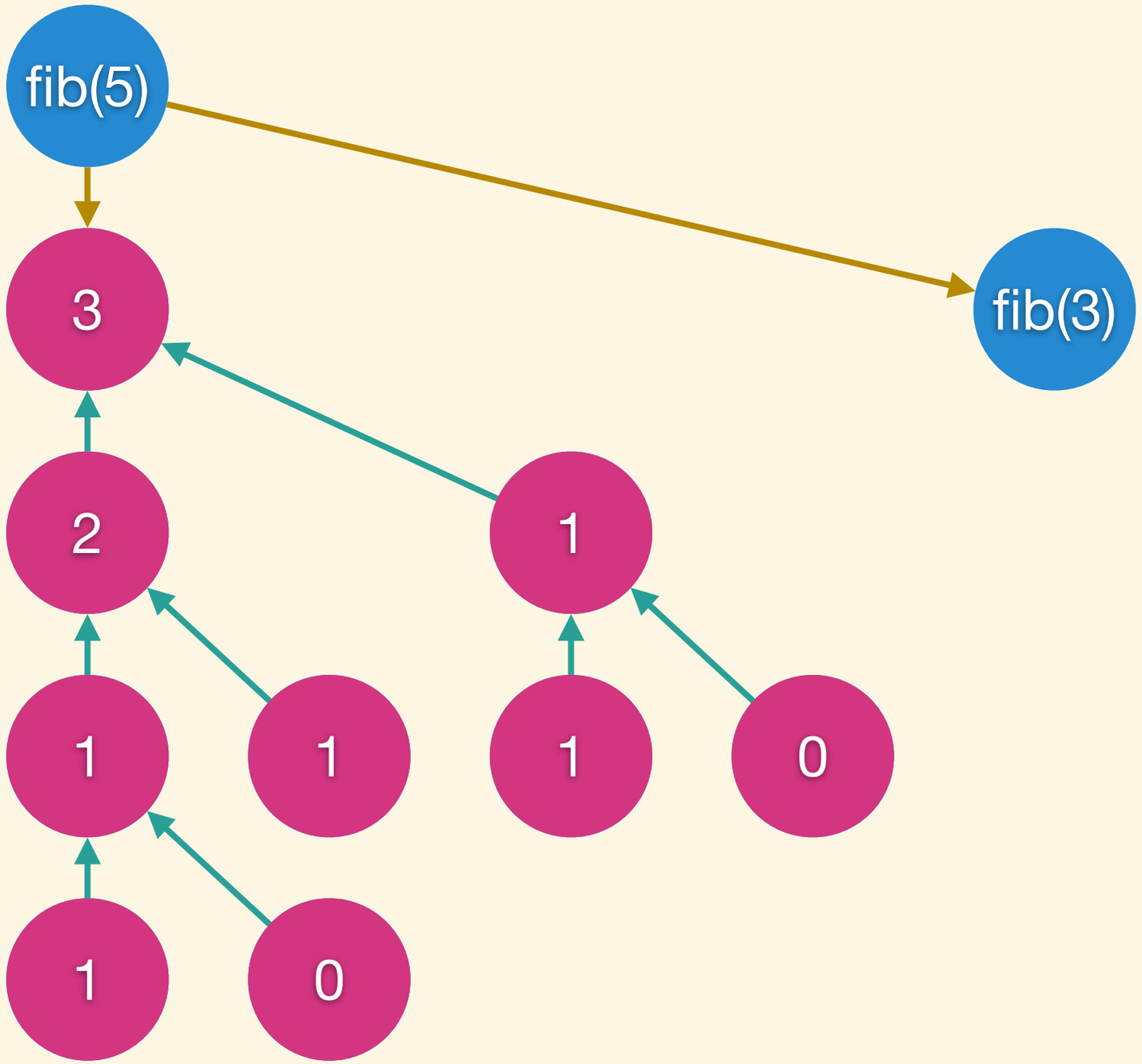
Fibonacci Sequence



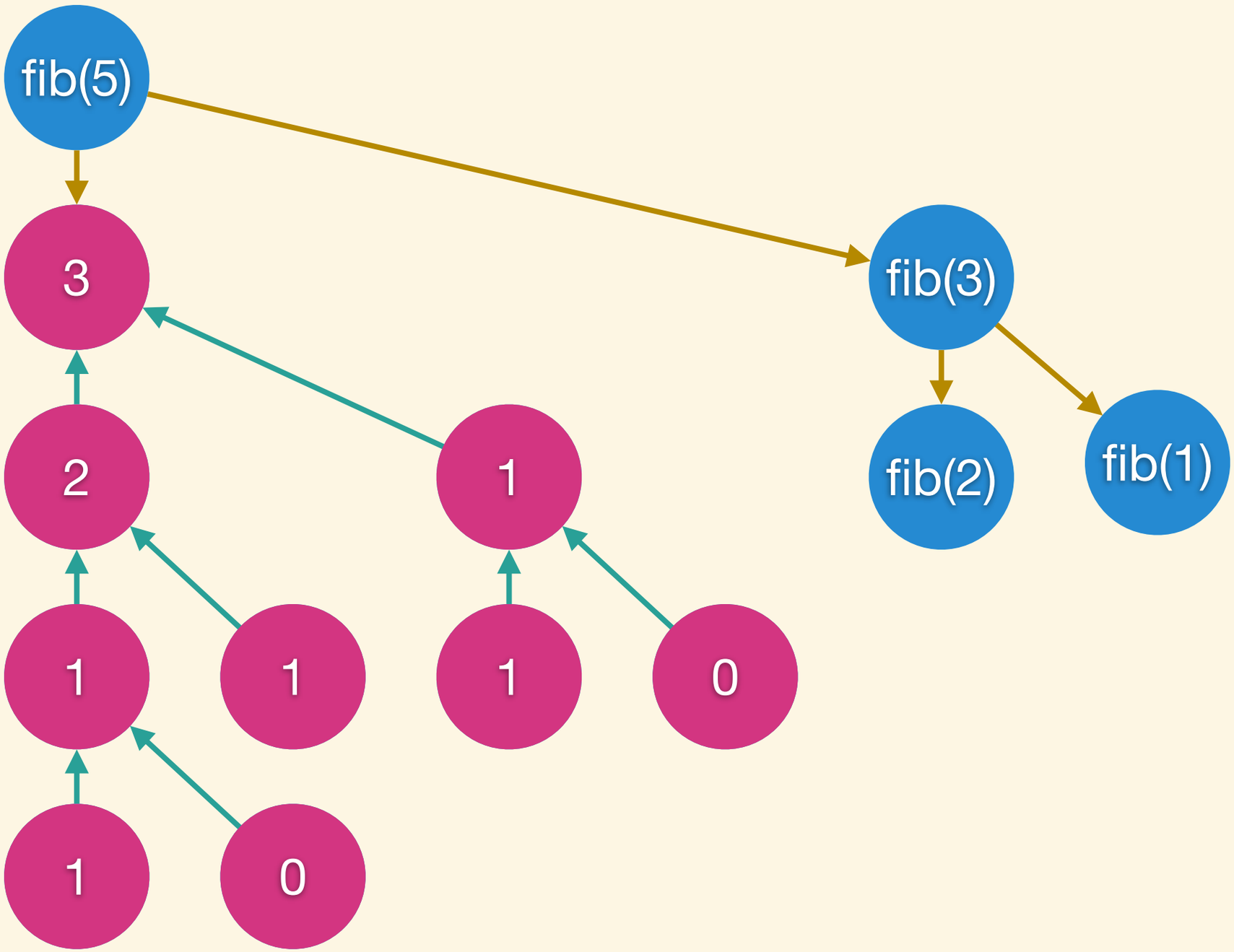
Fibonacci Sequence



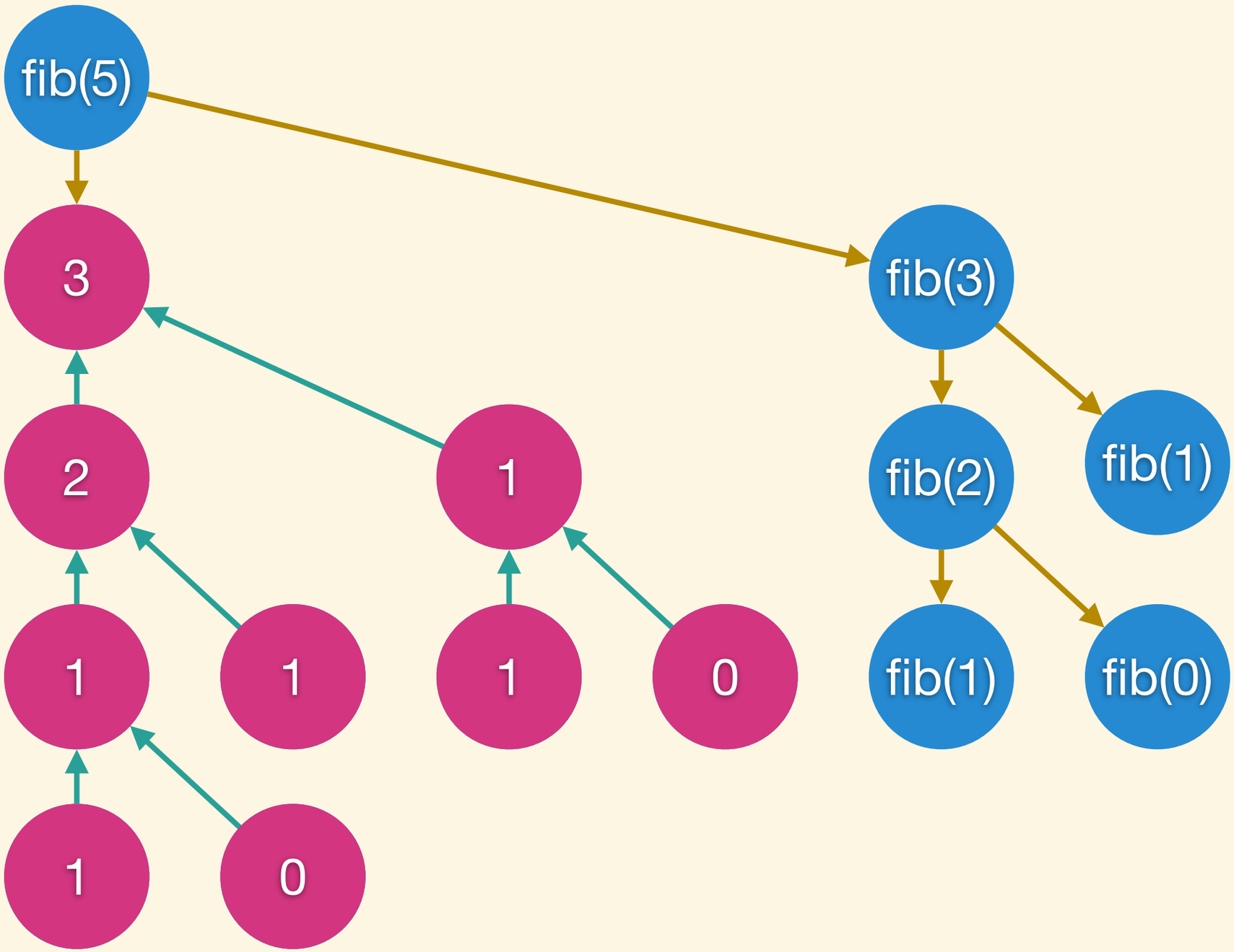
Fibonacci Sequence



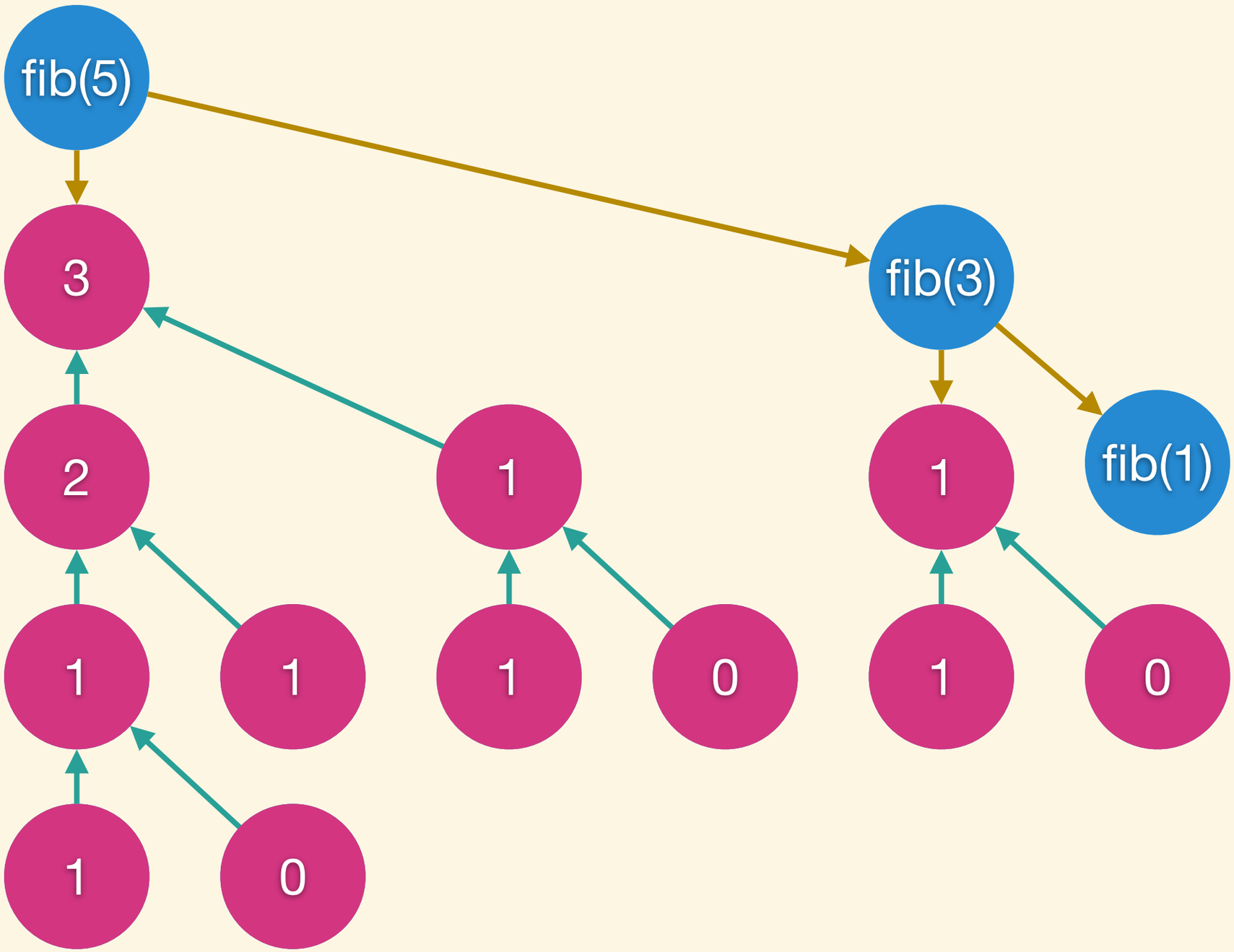
Fibonacci Sequence



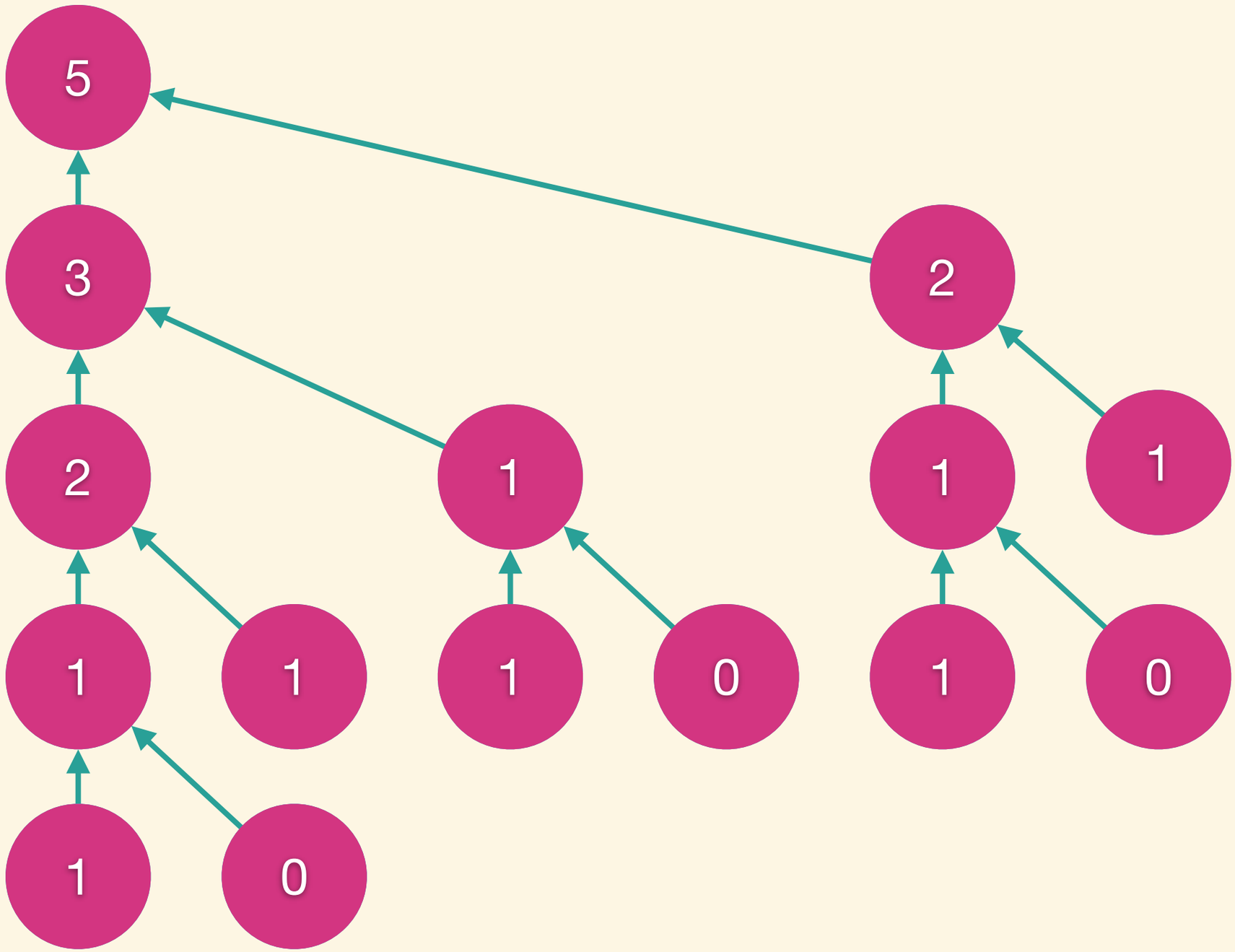
Fibonacci Sequence



Fibonacci Sequence



Fibonacci Sequence



```c
int fib( int x ) {
  if ( x <= 0 )
    return 0;
  if ( x == 1 )
    return 1;
  return fib( x - 1 ) + fib( x - 2 );
}

int main() {
  int ret = fib( 10 );
  return 0;
}
```

Iteration

不斷的利用已知，持續的求出結果以逼近答案。

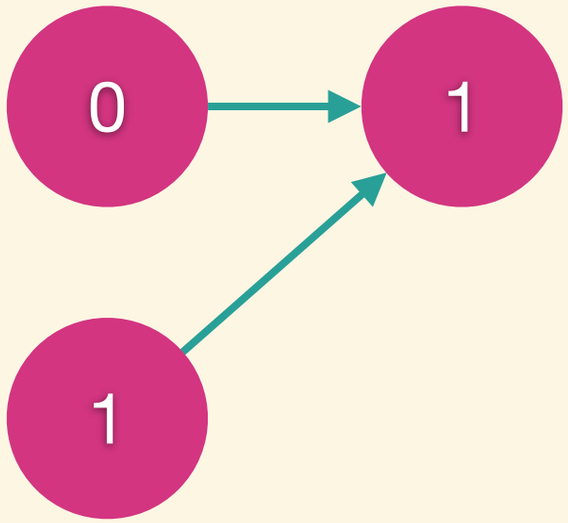
道生一，一生二，二生三，三生萬物。《老子》

Fibonacci Sequence

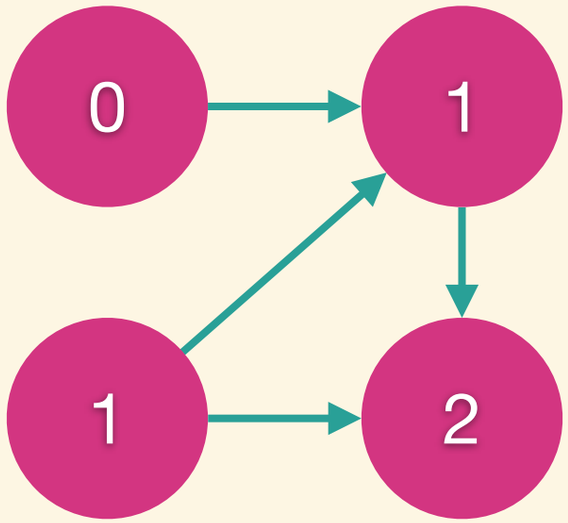
0

1

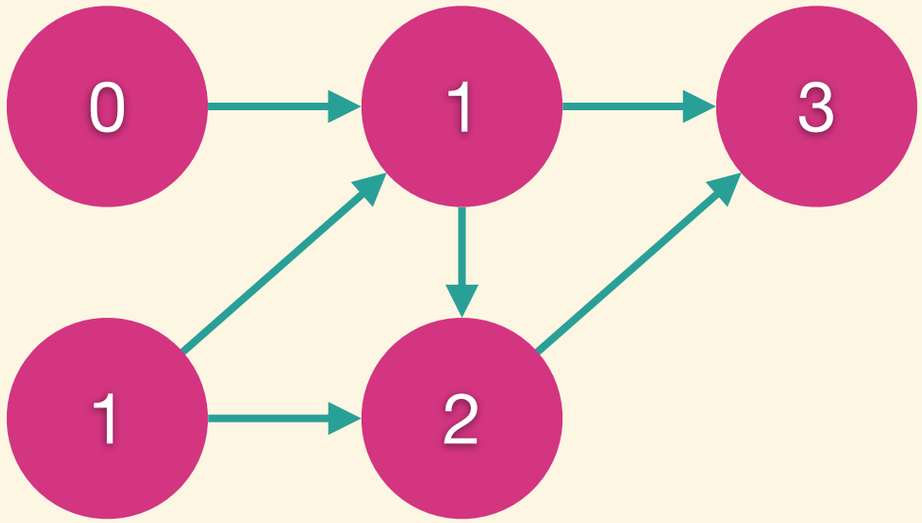
Fibonacci Sequence



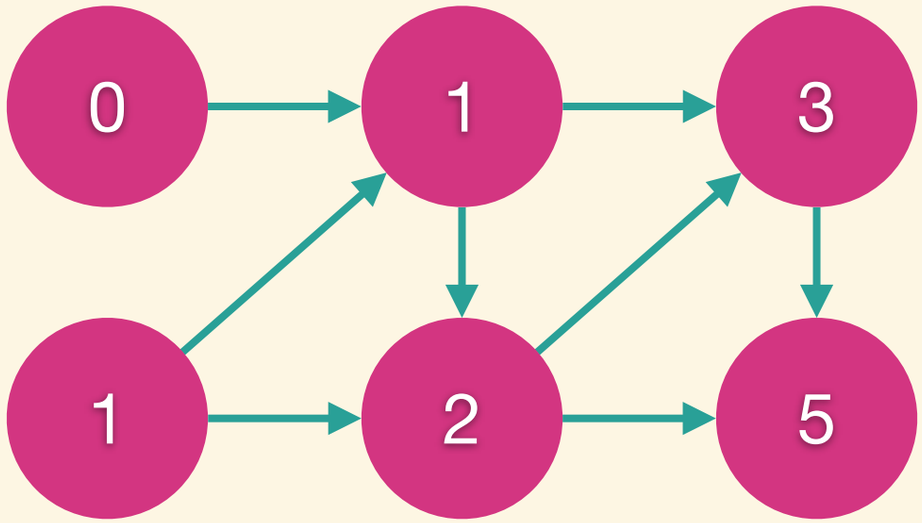
Fibonacci Sequence



Fibonacci Sequence



Fibonacci Sequence



```c
int main() {
  int f0 = 0, f1 = 1, f2;

  for ( int i = 0; i < 10; ++i ) {
    f2 = f0 + f1;
    f0 = f1, f1 = f2;
  }

  return 0;
}
```

遞迴只應天上有，凡人應當用迴圈。

Practice Now

POJ 1664 - 放苹果

reference

- http://www.csie.ntnu.edu.tw/~u91029/IterativeRecursive.html

Thank You for Your Listening.