# Fibonacci Numbers: A Deep Dive

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Abstract

TODO

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## Listings

$$\mathcal{O}(1)$$
 =  $\mathcal{O}(\text{yeah})$   
 $\mathcal{O}(\log n)$  =  $\mathcal{O}(\text{nice})$   
 $\mathcal{O}(n)$  =  $\mathcal{O}(k)$   
 $\mathcal{O}(n^2)$  =  $\mathcal{O}(\text{my})$   
 $\mathcal{O}(2^n)$  =  $\mathcal{O}(\text{no})$   
 $\mathcal{O}(n!)$  =  $\mathcal{O}(\text{mg})$   
 $\mathcal{O}(n^n)$  =  $\mathcal{O}(\text{sh*t!})$ 

#### 1 Recursion and Mathematical Induction

#### 2 Naive Recursion

- 2.1 Algorithm in Java
- 2.2 Binet's formula
- 2.2.1 Intuitive Explanation
- 2.2.2 Formal Derivation
- 2.3 Time Complexity (Big  $\mathcal{O}$ )
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- 4.1 Showcase: from int to double
- 4.2 When double goes wild

4.2.2 IEEE 754 Depresentation

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