

Fibonacci Sequence

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Class name: Algoritma dan Komputasi

The Fibonacci Sequence is a **series of numbers where each number is the sum of the two preceding numbers**. Generally defined as:

$$F_0 = 0, F_1 = 1$$

and for $n \geq 2$:

$$F_n = F_{n-1} + F_{n-2}$$

This results in the following sequence of numbers:

$$0, 1, 1, 2, 3, 5, 8, 13, 21, 34, \dots$$

Most important part of the Fibonacci Sequence

- **Recursive Characteristic:** always depends on the two previous values.
- **Found in many places in nature:** For example, in flower patterns, leaf arrangements, shell spirals, and body proportions.
- **Related to the Golden Ratio:** $\varphi \approx 1.618$ because of the ratio of two consecutive terms $\frac{F_{n+1}}{F_n} \rightarrow \varphi$ when $n \rightarrow \infty$

Flowchart

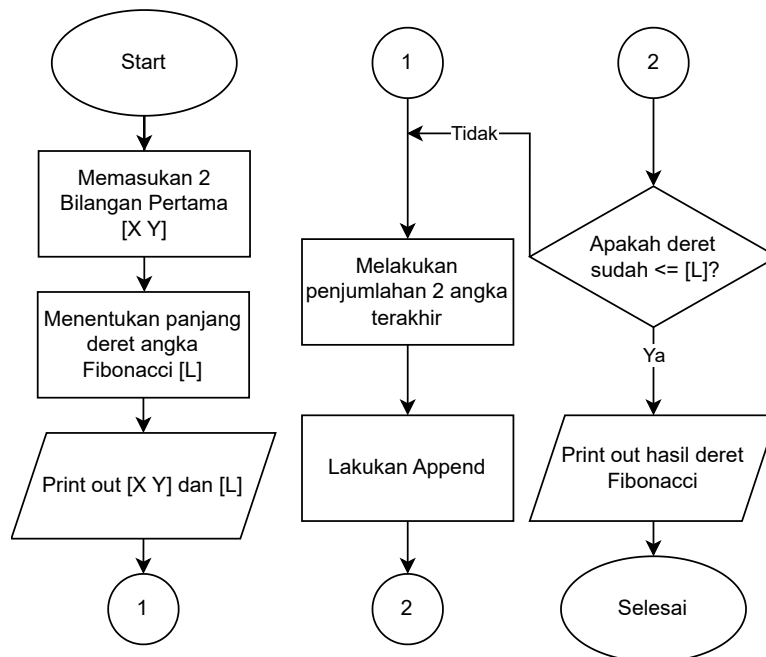


Figure 1: Flowchart program Fibonacci

Code

Listing 1: Code for Fibonacci Sequence

```
1 % Callbacks that handle component events
2 methods (Access = private)
3
4 % Button pushed function: GenerateButton
5 function GenerateButtonPushed(app, event)
6     % 1. Nilai dari Edit Field
7     X = app.MasukanAngkaXEditField.Value;
8     Y = app.MasukanAngkaYEditField.Value;
9     L = app.MasukanPanjangDeretEditField.Value;
10
11 % 2. Validasi input dari User
12 if L < 1
13     app.HasilEditField.Value = 'Panjang deret harus lebih dari 0.';
14     return;
15 end
16
17 % 3. Perhitungan Deret Fibonacci
18 if L == 1
19     fibo = [X];
20 elseif L == 2
21     fibo = [X, Y];
22 else
23     fibo = [X, Y];
24     for i = 3:L
25         bilangan_berikutnya = fibo(i-1) + fibo(i-2);
26         fibo = [fibo, bilangan_berikutnya];
27     end
28 end
29
30 % 4. Print Out
31 app.HasilEditField.Value = mat2str(fibo);
32 end
33 end
```

GUI

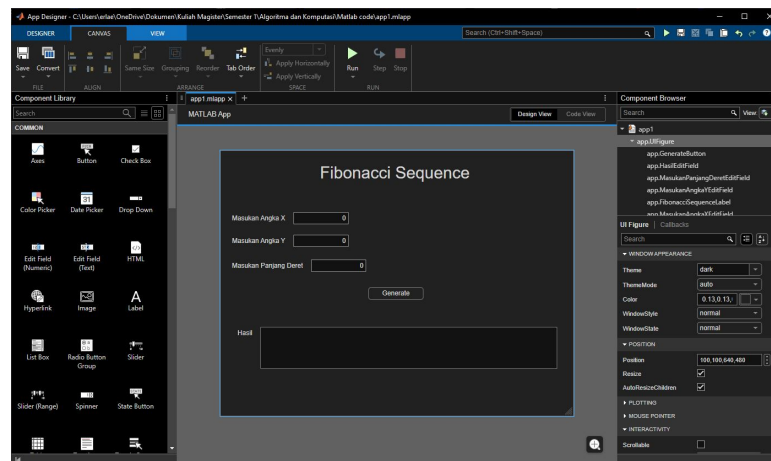


Figure 2: AppDesigner on Matlab

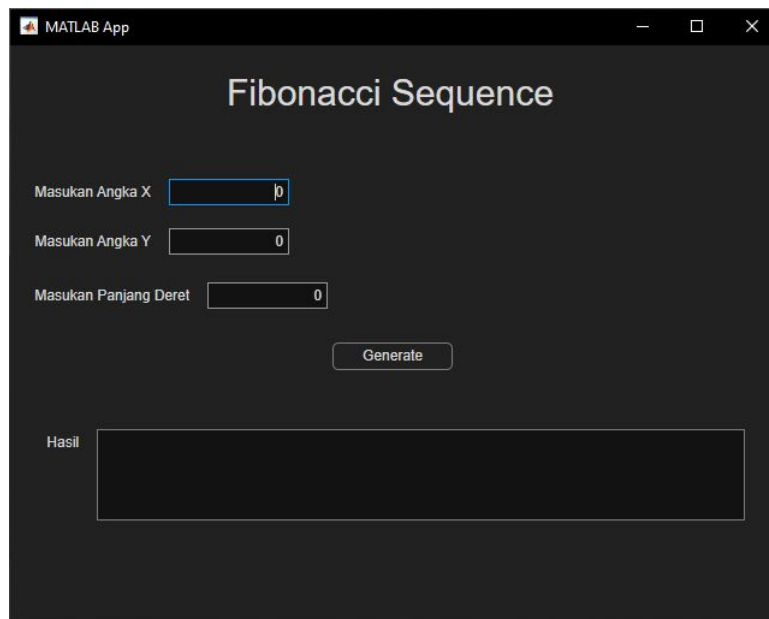


Figure 3: GUI Fibonacci Sequence

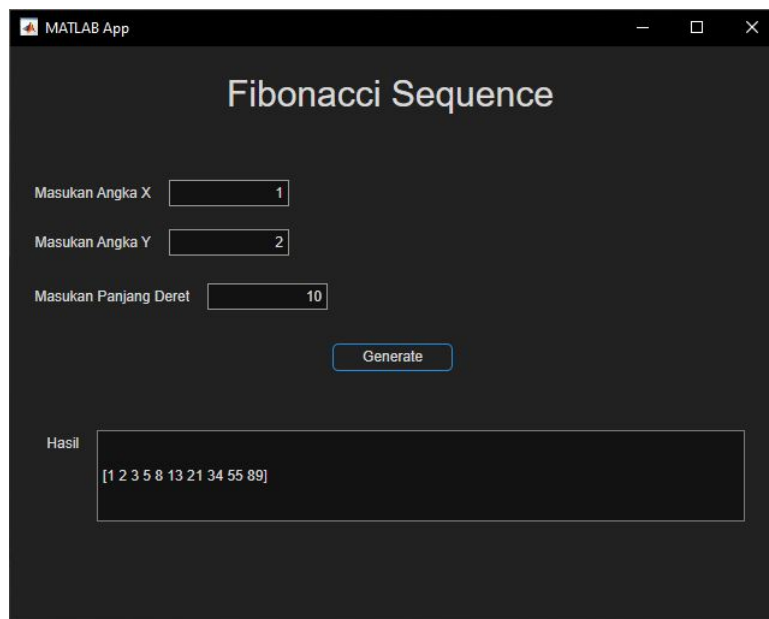


Figure 4: The Result of Fibonacci Calc

Link

Github : Silakan kunjungi Github

Video Report : Silakan kunjungi Video