

# Streamlit Python Library

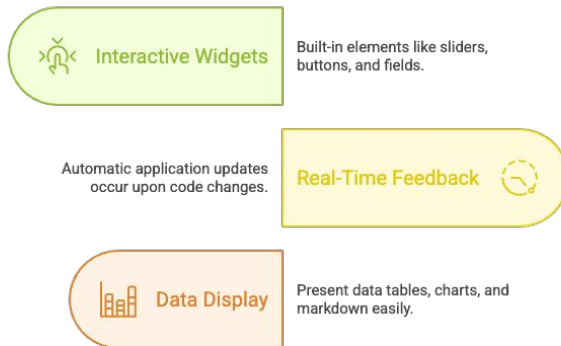
## Introduction

Streamlit is an open-source Python library that enables the development of interactive, data-driven web applications with minimal effort. It is especially valuable for data science and machine learning practitioners, allowing them to create web interfaces using only Python code.

## Key Advantages

- **Simplicity:** No need for HTML, CSS, or JavaScript—everything is done in Python.
- **Rapid Development:** Convert Python scripts into web apps in minutes.
- **Data Science Ready:** Seamlessly integrates with libraries such as Pandas, NumPy, Matplotlib, Plotly, and Scikit-learn.

### Streamlit Features



*Streamlit empowers developers to prototype and deploy powerful data applications with unmatched ease.*

# Importance of Test-Driven Development (TDD)

## Understanding TDD

Test-Driven Development (TDD) is a software development practice centered around the **Red-Green-Refactor** cycle:

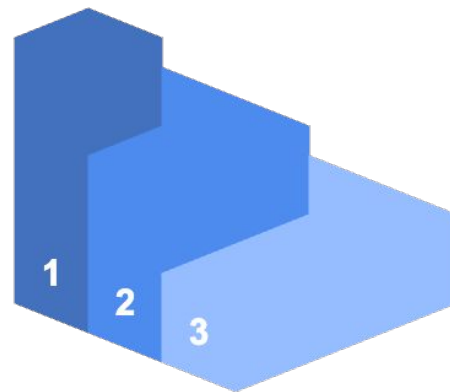
### Red-Green-Refactor cycle:

1. **Red** – Write a test that initially fails.
2. **Green** – Develop code that makes the test pass.
3. **Refactor** – Improve the code while keeping tests successful.

### Benefits of TDD

- **Higher Code Quality:** Ensures correctness through constant testing.
- **Improved Software Design:** Promotes modular, testable code structures.
- **Faster Debugging:** Detects issues early in the development process.
- **Confidence in Changes:** Provides safety net during refactoring or feature expansion.

## Achieving Robust EMI Calculator



### Create Unit Tests

Develop comprehensive tests to cover all aspects of the calculator.

### Handle Special Cases

Address unique scenarios like zero interest or high tenure.

### Refactor with Confidence

Improve code structure knowing tests will catch errors.

# EMI Calculator Functionality

The EMI (Equated Monthly Installment) calculator is a financial tool that estimates the fixed monthly payment required to repay a loan. It offers real-time interactivity and intuitive inputs to help users plan loan repayments.

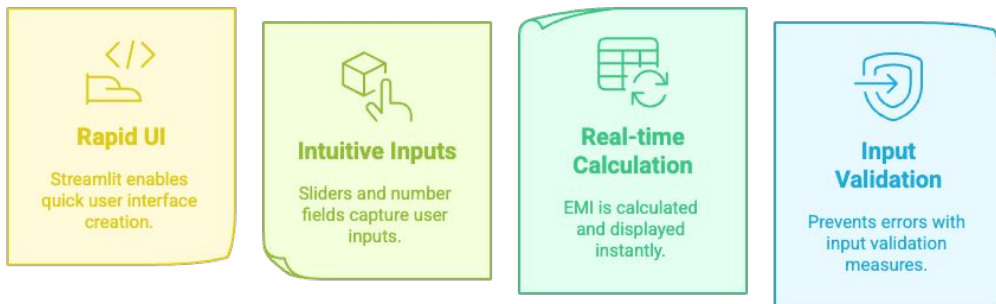
## Input Parameters

- **Principal Amount (P)** – Total loan amount
- **Interest Rate (R)** – Annual interest rate in percentage
- **Loan Tenure (N)** – Duration of loan in months or years

## Output

- **Monthly EMI**, calculated using the standard formula: 
$$A = P \times \frac{r(1+r)^n}{(1+r)^n - 1}$$

## EMI Calculator Features



## Streamlit application screenshot

### EMI Calculator

Calculate your Equated Monthly Installment (EMI)

Principal Loan Amount (₹)

100000.00

Annual Interest Rate (%)

10.00

Loan Tenure (Years)

1.00

Calculate EMI

### How is EMI calculated?

The EMI is calculated using the formula:

$$EMI = P \times r \times (1 + r)^n / ((1 + r)^n - 1)$$

where:

- P = Principal loan amount
- r = Monthly interest rate (Annual rate ÷ 12 ÷ 100)
- n = Total number of months (Years × 12)