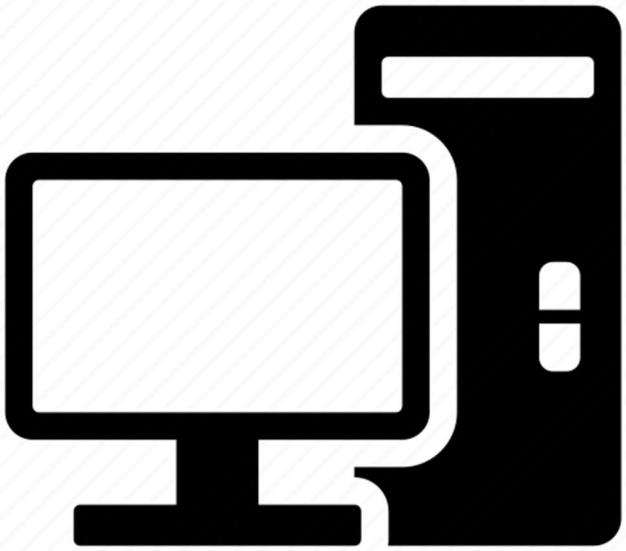
Python Tools for Civil Engineering Applications

Python-based tools for structural and geotechnical engineering analysis, modeling, and visualization

by

Eliott THOMMES



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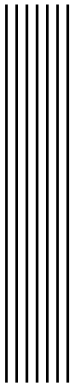
THOMMES Eliott

January 5, 2026

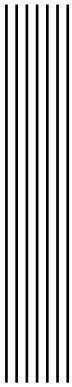


Abstract

Keywords: Python, Civil Engineering.

Résumé

Mots-clés: Python, Génie Civil.



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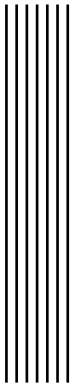
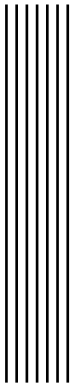
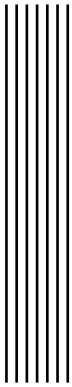


Contents



List of Figures



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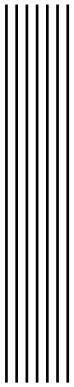

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- Add `automake` to your package option list when you load `glossaries-extra.sty`. For example:

  ```
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  ```

- Run the external (Lua) application:

  ```
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  ```

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1 PlotLib

Contents

1.1 Overview

1.2 Dependencies and External Libraries

1.3 Architecture and Organization

1.4 Core Classes

1.4.1 Class `Plot`

- **Description:** Represents a 2D plotting object capable of rendering and managing basic plot elements.
- **Inherits from:** `BasePlot` Hyperref où label

- **Constructor:**

```
def __init__(self, title: str = "", data: list = None)
```

- **Property:**
  - `title` (str): A property for accessing and setting the plot title.
- **Methods:**
  - `plot()`:
    - **Description:** Plots a line graph using the provided x and y data.
    - **Signature:**

```
def plot_line(x: list, y: list, label: str = "", color: str = "blue") ->
↪ None
```

    - **Parameters:**
      - `x` (list): X-axis data points.
      - `y` (list): Y-axis data points.
      - `label` (str, optional): Label for the line.
      - `color` (str, optional): Color of the line.
    - **Returns:** `None`
- **Example Usage:**

```
p = Plot(title="My Graph", data=[(0, 1), (1, 2)])
print(p.title)
p.title = "Updated Title"
p.set_data([(0, 0), (1, 1)])
p.plot()
```

1.5 Functions

1.5.1 Function `plot_line`

- **Description:** Plots a line graph using the provided x and y data.
- **Signature:**

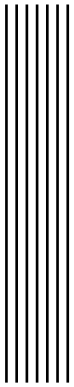
```
def plot_line(x: list, y: list, label: str = "", color: str = "blue") -> None
```

- **Parameters:**
  - `x` (list): X-axis data points.
  - `y` (list): Y-axis data points.
  - `label` (str, optional): Label for the line.
  - `color` (str, optional): Color of the line.
- **Returns:** `None`
- **Example:**

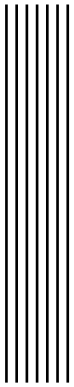
```
plot_line([1, 2, 3], [4, 5, 6], label="Data", color="red")
```

1.6 Usage Examples

1.7 Development and Planned Improvements



Bibliography



Glossary

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