# Guide benchmarking

This guide is intended for those who plan to use the benchmarking of the pysatl-cpd project to analyze algorithms for finding change points.

## Installation

Clone repository:

```
git clone https://github.com/PySATL/pysatl-cpd.git
```

### Linux

Go to repository folder and run installation script:

```
cd pysatl-cpd
chmod +x scripts/install_user_linux.sh
./install_user_linux.sh
```

### Windows

Go to repository folder and run installation script

```
Set-Location pysatl-cpd
./scripts/install_user_windows.ps1
```

## Data Generation

### Available distributions

| Распределение | Название | Параметры |
|---|---|---|
| Нормальное | `normal` | `mean`, `variance` |
| Экспоненциальное | `exponential` | `rate` |
| Вейбулла | `weibull` | `shape`, `scale` |
| Равномерное | `uniform` | `min`, `max` |
| Бета | `beta` | `alpha`, `beta` |
| Гамма | `gamma` | `alpha`, `beta` |
| t-Стьюдента | `t` | `n` |

| Распределение | Название | Параметры |
|---|---|---|
| Логнормальное | `lognorm` | `s` |
| Многомерное нормальное | `multivariate_normal` | `mean`, в виде списка-строки, например `"[0.5, 2.0]"` |

## How to configure?

To generate a test time series, create a new configuration file inside the `pysatl_cpd/examples/configs` directory. This file defines the segments that will be concatenated in order to create the final time series.

Structure of the config file:

```yaml
- name: config_name
  distributions:
     - type: dist1
       length: length1
       parameters:
         parameter1_1: value1_1
         parameter1_2: value1_2
     - type: dist2
       length: length2
       parameters:
         parameter2_1: value2_1
         parameter2_2: value2_2
     # ... you can add more distribution segments here
```

**Fields**:

- `name`: A unique name for your configuration.
- `distributions`: A list of data segments to be generated. Each item in the list is a segment.
- `type`: The distribution type for the segment (e.g., normal, uniform).
- `length`: The length (number of data points) for this segment.
- `parameters`: The parameters required by the chosen distribution type (e.g., mean and variance for a normal distribution).

> Note: The available distribution types and their parameters must match the options listed in the table above. Please refer to it for a complete list of supported distributions and their required parameters.

## Config example

```yaml
- name: example
  distributions:
    - type: exponential
      length: 200
      parameters:
```

```
        rate: 2.0
    - type: beta
      length: 200
      parameters:
        alpha:  1.0
        beta:  5.0
    - type: uniform
      length: 200
      parameters:
        min: 0
        max: 0.5
```

# Algorithm configure

# Experiment run

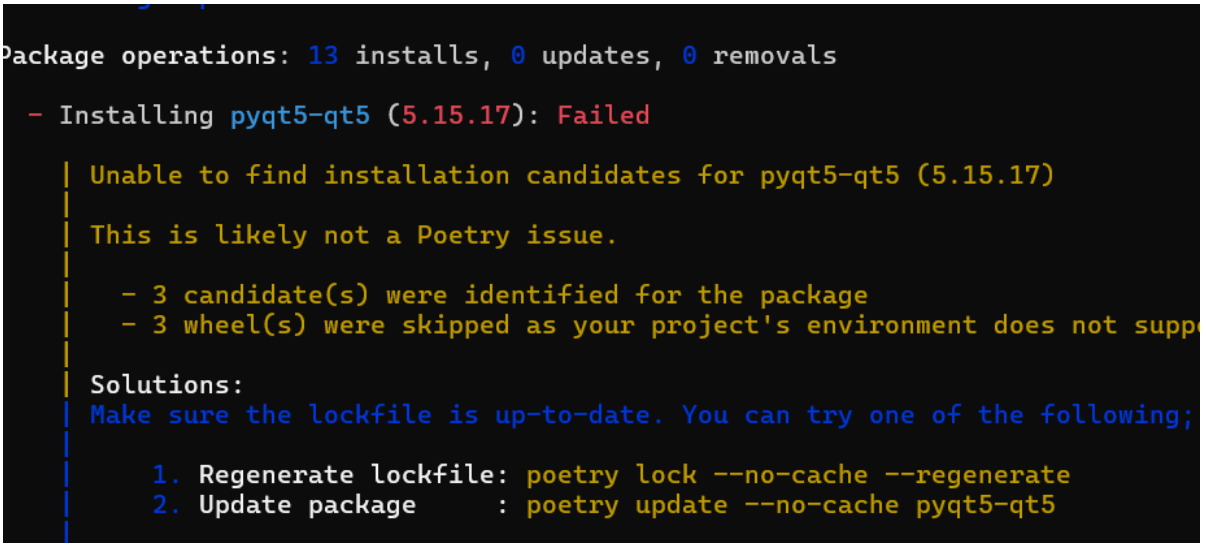
Run example in the main directory:

```
poetry run python example.py
```

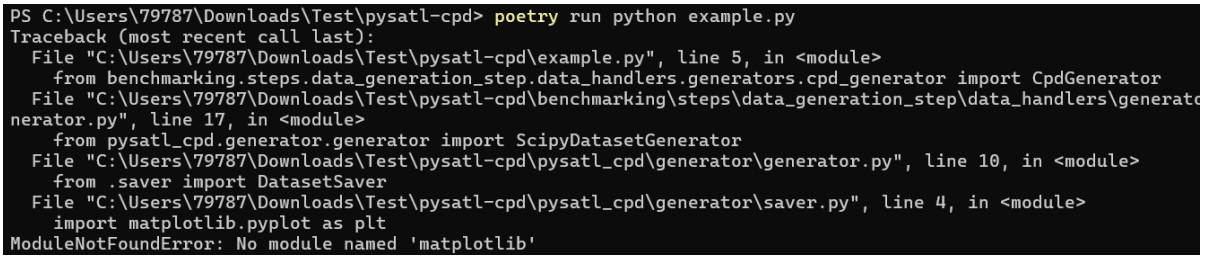
# Troubleshooting

## Import error: cannot import matplotlib

If you saw a similar error when running the script:




And then you get this error:



Then try installing a lower version of the package:

```
poetry add pyqt5-qt5==5.15.2
```