

Docker Setup

To ease the use of the data and its manipulation we recommend creating a folder tree as follow:

```
project/
├── data_surce/
│   ├── user_data_endogenous.csv
│   └── user_data_exogenous.csv
├── config/
│   └── config.json
├── logs/
└── explored_models/
```

Data description:

- The csv columns can contain headers
- user_data_endogenous.csv: It is a csv file with a single column with the time series of interest.
- user_data_exogenous.csv: It is a csv file. It can contain one or multiple columns with the exogenous data.

“config.json”, this is a JSON file where various parameters can be adjusted:

- For Optimizing an N-BEATS Architecture:

The config.json file contains fields related to the hyperparameters that can be optimized simultaneously. These fields are lists where the first number represents the lower bound and the second number represents the upper bound.
- To Train a Single N-BEATS Neural Network:

Use the first number in the list for each hyperparameter as a placeholder for your specific parameter.

Creating the Container:

- With Optional Folder Structure:

If you choose to use the recommended optional folder structure, make sure to place your files in the appropriate folders before creating the container.

Run the following command in your project folder's terminal:

```
docker run -it --name [Your Chosen Name] -v [Your Path]/config:/app/config -v [Your Path]/data_source:/app/data_source -v [Your Path]/logs:/app/logs -v [Your Path]/logs/explored_models:/app/logs/explored_models nbeats_optimizer
```

- Without Predefined Folder Structure or Data:

If you decide not to create the folder structure in advance or provide the data, run the following command in your project folder's terminal:

```
docker run -it --name [Your Chosen Name] nbeats_optimizer
```

You can use the **docker cp** command to perform necessary file operations. The Docker container includes a config.json file in the config folder.

Optimizing N-BEATS:

- In the Container's Terminal:

Run **python src/main.py** to optimize an N-BEATS Neural Network according to the parameters in config.json.

- Command-Line Arguments for main.py:

--opt='opt' (default): To optimize the hyperparameters.

--opt='train': To train a single N-BEATS Neural Network with the provided hyperparameters.

--config_path: To specify a custom path for the config.json file.

Logs:

- logs/explored_models/study.pickle, study.pickle can be loaded using pickle and it will result in a study object from optuna. In the optuna object you will have access to all the details of the optimization study. For details visit Optuna website.
- logs/NBEATS/logs, in this folder one can find TensorBoard files.
- logs/explored_models/trials.json. The file trial json contains full information of the optimization process, like hyperparameters, learning curves and accuracy metrics
- logs/single_nbeats.pickle, it will contain a dictionary with information relative to training of a single N-BEATS training.
- Logs/NBEATS: checkpoints and models

Benchmark

Please, take into account the computing requirements of the time series forecaster:

