

Project Details

Requirement Packages:

- pandas
- numpy
- matplotlib
- tqdm
- pickle
- scikit-learn
- xgboost
- torch
- torch-geometric-temporal
- statsmodels
- torchmetrics

Notebook Description:

- **Data_preprocessing.ipynb:** This notebook focuses on loading the raw data and preprocessing it to ensure it is in a suitable format, specifically a Pandas dataframe. The preprocessed data will serve as input for the subsequent notebooks.
- **Graph_Construction.ipynb:** In this notebook, the data that has been transformed into a tabular format by the previous notebook is further processed to be in a suitable format for graph neural networks. The notebook handles the conversion of the data into an appropriate input format for graph-based models.
- **TGCN_model.ipynb:** This notebook revolves around training and evaluating multiple architectures of graph neural networks. The focus is on implementing Temporal Graph Convolutional Networks (TGCN) and exploring their performance for the given task.
- **LSTM_model.ipynb:** This notebook is dedicated to training and evaluating LSTM (Long Short-Term Memory) neural networks. The emphasis is on implementing and assessing the performance of LSTM models for the project.
- **Comparison_Popular_ML_Algo.ipynb:** In this notebook, a variety of commonly used state-of-the-art machine learning algorithms are trained and evaluated. The goal is to conduct a fair comparison between these popular algorithms and the proposed method in the project.
- **Backtesting.ipynb:** This notebook focuses on implementing a back testing technique, which involves applying the trained models to real-life scenarios. The notebook explores how well the models perform in practical situations and evaluates their effectiveness.

Project Structure

```
├── Backtesting.ipynb
├── Comparison_Popular_ML_Algo.ipynb
├── Data_Preprocessing.ipynb
├── Graph_Construction.ipynb
├── LSTM_model.ipynb
├── TGCN_model.ipynb
├── io
│   ├── input
│   │   ├── base_data
│   │   ├── data_intermediate
│   │   │   ├── edge_weights
│   │   │   │   ├── test
│   │   │   │   ├── train
│   │   │   │   └── val
│   │   │   ├── edges
│   │   │   │   ├── test
│   │   │   │   ├── train
│   │   │   │   └── val
│   │   │   ├── granger_results
│   │   │   ├── node_features
│   │   │   │   ├── test
│   │   │   │   ├── train
│   │   │   │   └── val
│   │   │   └── node_labels
│   │   │       ├── test
│   │   │       ├── train
│   │   │       └── val
│   │   └── data_raw
│   └── output
│       └── exports
│           ├── analysis_plots
│           ├── experiments_results
│           ├── metrics_plots
│           └── predictions
```