National College of Ireland

Configuration Manual

MSc AI for Business
Practicum 2

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Project Submission Sheet
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Configuration Manual

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1 Section 1 - Preparation of the execution environment

1.1 Repository

For the execution of the models described in this project, in addition to the attachment of sources available on the Moodle platform, the project was also made available via GitHub to facilitate its installation. If the user wants to use GitHub, if you want, I go below.

```
git clone <https://github.com/catelix/practicum->
cd investment_portfolio
```

1.2 Virtual environment

Recommended creating a virtual environment to isolate the Python environment.

```
python -m venv venv
source venv/bin/activate  # Para Windows: venv\Scripts\activate
```

1.3 Installation of the Dependencies

Perform the installation of the Python dependencies using the requirements.txt file. Thus, install all necessary libraries.

```
pip install -r requirements.txt
```

1.4 Installation check

It is strongly recommended, after installation, to check that the libraries have been installed correctly, which can be done through the Python code below.

```
python -c "import tensorflow, yfinance, pandas; print('
   Installation successful!')"
```

2 Running the model

2.1 Completed Execution

The authors left the script prepared for the full execution of the entire model, without the need for additional executions, as per the code below.

```
python run_all.py
```

3 Section 3 - Organization of the Project Structure

The project is organized in step structures to facilitate understanding, visualization and modular maintenance if necessary. We followed the structure below to be able to keep the project within CodeClean standards.

```
investment_portfolio/
 data/
    raw/                    # Raw data obtained via yfinance
    processed/              # Cleaned datasets with feature engineering

 src/
    data/                   # Scripts for data collection and preprocessing
    models/                 # LSTM and HMM training scripts
    portfolio/              # Portfolio simulation logic
    evaluation/             # Performance metrics computation
    visualization/          # Scripts for comparative visualization

 results/
    predictions/            # Model-generated forecasts
    metrics/                # Performance evaluation metrics
    plots/                  # Comparison charts and plots

 tests/                      # Unit testing scripts
 run_all.py                  # Script to run the complete pipeline
 requirements.txt            # Dependency list for Python environment
 README.md                   # Project overview and usage instructions
```