automating-execution-jupyter-notebook-files-python-scripts-hugo-static-site-generation

June 28, 2025

1 Automating Execution of Jupyter Notebook Files, Python Scripts, and Hugo Static Site Generation

1.1 Python Imports

[1]:
```python
# Standard Library
import datetime
import io
import os
import random
import sys
import warnings

from datetime import datetime, timedelta
from pathlib import Path

# Data Handling
import numpy as np
import pandas as pd

# Data Visualization
import matplotlib.dates as mdates
import matplotlib.pyplot as plt
import matplotlib.ticker as mtick
import seaborn as sns
from matplotlib.ticker import FormatStrFormatter, FuncFormatter, MultipleLocator

# Data Sources
import yfinance as yf

# Statistical Analysis
import statsmodels.api as sm

# Machine Learning
from sklearn.decomposition import PCA
from sklearn.preprocessing import StandardScaler
```

```
# Suppress warnings
warnings.filterwarnings("ignore")
```

1.2 Add Directories To Path

[2]:
```
# Add the source subdirectory to the system path to allow import config from␣
↪settings.py
current_directory = Path(os.getcwd())
website_base_directory = current_directory.parent.parent.parent
src_directory = website_base_directory / "src"
sys.path.append(str(src_directory)) if str(src_directory) not in sys.path else␣
↪None

# Import settings.py
from settings import config

# Add configured directories from config to path
SOURCE_DIR = config("SOURCE_DIR")
sys.path.append(str(Path(SOURCE_DIR))) if str(Path(SOURCE_DIR)) not in sys.path␣
↪else None

QUANT_FINANCE_RESEARCH_BASE_DIR = config("QUANT_FINANCE_RESEARCH_BASE_DIR")
sys.path.append(str(Path(QUANT_FINANCE_RESEARCH_BASE_DIR))) if␣
↪str(Path(QUANT_FINANCE_RESEARCH_BASE_DIR)) not in sys.path else None

QUANT_FINANCE_RESEARCH_SOURCE_DIR = config("QUANT_FINANCE_RESEARCH_SOURCE_DIR")
sys.path.append(str(Path(QUANT_FINANCE_RESEARCH_SOURCE_DIR))) if␣
↪str(Path(QUANT_FINANCE_RESEARCH_SOURCE_DIR)) not in sys.path else None

# Add other configured directories
BASE_DIR = config("BASE_DIR")
CONTENT_DIR = config("CONTENT_DIR")
POSTS_DIR = config("POSTS_DIR")
PAGES_DIR = config("PAGES_DIR")
PUBLIC_DIR = config("PUBLIC_DIR")
SOURCE_DIR = config("SOURCE_DIR")
DATA_DIR = config("DATA_DIR")
DATA_MANUAL_DIR = config("DATA_MANUAL_DIR")

# Print system path
for i, path in enumerate(sys.path):
    print(f"{i}: {path}")
```

```
0: /usr/lib/python313.zip
1: /usr/lib/python3.13
2: /usr/lib/python3.13/lib-dynload
```

```
3:
4: /home/jared/python-virtual-envs/general_313/lib/python3.13/site-packages
5: /home/jared/Cloud_Storage/Dropbox/Websites/jaredszajkowski.github.io/src
6: /home/jared/Cloud_Storage/Dropbox/Quant_Finance_Research
7: /home/jared/Cloud_Storage/Dropbox/Quant_Finance_Research/src
```

1.3 Track Index Dependencies

[3]:
```python
# Create file to track markdown dependencies
dep_file = Path("index_dep.txt")
dep_file.write_text("")
```

[3]:
```
0
```

1.4 Python Functions

[4]:
```python
from calc_vix_trade_pnl import calc_vix_trade_pnl
from df_info import df_info
from df_info_markdown import df_info_markdown
from export_track_md_deps import export_track_md_deps
from load_data import load_data
from pandas_set_decimal_places import pandas_set_decimal_places
from plot_price import plot_price
from plot_stats import plot_stats
from plot_vix_with_trades import plot_vix_with_trades
from yf_pull_data import yf_pull_data
```

1.5 Data Overview (VIX)

1.5.1 Acquire CBOE Volatility Index (VIX) Data

[5]:
```python
yf_pull_data(
    base_directory=DATA_DIR,
    ticker="^VIX",
    source="Yahoo_Finance",
    asset_class="Indices",
    excel_export=True,
    pickle_export=True,
    output_confirmation=True,
)
```

```
YF.download() has changed argument auto_adjust default to True

 [*********************100%***********************]  1 of 1 completed


The first and last date of data for ^VIX is:
```

```
            Close   High    Low   Open  Volume
Date
1990-01-02  17.24  17.24  17.24  17.24       0

            Close       High        Low   Open  Volume
Date
2025-06-26  16.59  16.780001  16.110001  16.67       0

Yahoo Finance data complete for ^VIX
--------------------
```

[5]:

	Close	High	Low	Open	Volume
Date					
1990-01-02	17.240000	17.240000	17.240000	17.240000	0
1990-01-03	18.190001	18.190001	18.190001	18.190001	0
1990-01-04	19.219999	19.219999	19.219999	19.219999	0
1990-01-05	20.110001	20.110001	20.110001	20.110001	0
1990-01-08	20.260000	20.260000	20.260000	20.260000	0
…	…	…	…	…	…
2025-06-20	20.620001	21.070000	19.110001	20.740000	0
2025-06-23	19.830000	22.510000	19.820000	21.150000	0
2025-06-24	17.480000	18.719999	17.330000	18.190001	0
2025-06-25	16.760000	17.510000	16.680000	17.280001	0
2025-06-26	16.590000	16.780001	16.110001	16.670000	0

[8937 rows x 5 columns]

[6]:
```
# Copy this <!-- INSERT_01_VIX_Stats_By_Year_HERE --> to index_temp.md
# export_track_md_deps(dep_file=dep_file, md_filename="01_VIX_Stats_By_Year.
↪md", content=vix_stats_by_year.to_markdown(floatfmt=".2f"))
```

[7]:
```
# Copy this <!-- INSERT_02_VVIX_DF_Info_HERE --> to index_temp.md
# export_track_md_deps(dep_file=dep_file, md_filename="02_VVIX_DF_Info.md",␣
↪content=df_info_markdown(vix))
```

[8]:
```
# Copy this <!-- INSERT_11_Net_Profit_Percent_HERE --> to index_temp.md
# export_track_md_deps(dep_file=dep_file, md_filename="11_Net_Profit_Percent.
↪md", content=net_profit_percent_str)
```