In [1]:
```
!pip install neuralforecast datasetsforecast
```

```
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: neuralforecast in /home/blair/.local/lib/python3.10/site-packages (1.6.4)
Requirement already satisfied: datasetsforecast in /home/blair/.local/lib/python3.10/site-packages (0.0.8)
Requirement already satisfied: numba in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (0.58.0)
Requirement already satisfied: numpy>=1.21.6 in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (1.25.2)
Requirement already satisfied: optuna in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (3.4.0)
Requirement already satisfied: pandas>=1.3.5 in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (2.1.1)
Requirement already satisfied: pytorch-lightning>=2.0.0 in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (2.1.0)
Requirement already satisfied: ray>=2.2.0 in /home/blair/.local/lib/python3.10/site-packages (from ray[tune]>=2.2.0->neuralforecast) (2.7.1)
Requirement already satisfied: torch>=2.0.0 in /home/blair/.local/lib/python3.10/site-packages (from neuralforecast) (2.1.0)
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Requirement already satisfied: aiohttp in /home/blair/.local/lib/python3.10/site-packages (from datasetsforecast) (3.8.6)
Requirement already satisfied: fugue>=0.8.1 in /home/blair/.local/lib/python3.10/site-packages (from datasetsforecast) (0.8.6)
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Requirement already satisfied: tqdm in /home/blair/.local/lib/python3.10/site-packages (from datasetsforecast) (4.66.1)
Requirement already satisfied: xlrd>=1.0.0 in /home/blair/.local/lib/python3.10/site-packages (from datasetsforecast) (2.0.1)
Requirement already satisfied: triad>=0.9.1 in /home/blair/.local/lib/python3.10/site-packages (from fugue>=0.8.1->datasetsforecast) (0.9.1)
Requirement already satisfied: adagio>=0.2.4 in /home/blair/.local/lib/python3.10/site-packages (from fugue>=0.8.1->datasetsforecast) (0.2.4)
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Requirement already satisfied: fugue-sql-antlr>=0.1.6 in /home/blair/.local/lib/python3.10/site-packages (from fugue>=0.8.1->datasetsforecast) (0.1.7)
Requirement already satisfied: sqlglot in /home/blair/.local/lib/python3.10/site-packages (from fugue>=0.8.1->datasetsforecast) (18.15.0)
Requirement already satisfied: jinja2 in /home/blair/.local/lib/python3.10/site-packages (from fugue>=0.8.1->datasetsforecast) (3.1.2)
Requirement already satisfied: python-dateutil>=2.8.2 in /home/blair/.local/lib/python3.10/site-packages (from pandas>=1.3.5->neuralforecast) (2.8.2)
Requirement already satisfied: pytz>=2020.1 in /home/blair/.local/lib/python3.10/site-packages (from pandas>=1.3.5->neuralforecast) (2023.3.post1)
Requirement already satisfied: tzdata>=2022.1 in /home/blair/.local/lib/python3.10/site-packages (from pandas>=1.3.5->neuralforecast) (2023.3)
Requirement already satisfied: PyYAML>=5.4 in /usr/lib/python3/dist-packages (from pytorch-lightning>=2.0.0->neuralforecast) (5.4.1)
Requirement already satisfied: fsspec>2021.06.0 in /home/blair/.local/lib/python3.10/site-packages (from fsspec[http]>2021.06.0->pytorch-lightning>=2.0.0->neuralforecast) (2023.9.2)
Requirement already satisfied: torchmetrics>=0.7.0 in /home/blair/.local/lib/python3.10/site-packages (from pytorch-lightning>=2.0.0->neuralforecast) (1.2.0)
Requirement already satisfied: packaging>=20.0 in /home/blair/.local/lib/python3.10/site-packages (from pytorch-lightning>=2.0.0->neuralforecast) (23.2)
Requirement already satisfied: typing-extensions>=4.0.0 in /home/blair/.local/lib/python3.10/site-packages (from pytorch-lightning>=2.0.0->neuralforecast) (4.8.0)
Requirement already satisfied: lightning-utilities>=0.8.0 in /home/blair/.local/lib/python3.10/site-packages (from pytorch-lightning>=2.0.0->neuralforecast) (0.9.0)
Requirement already satisfied: click>=7.0 in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (8.1.7)
Requirement already satisfied: filelock in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (3.12.4)
Requirement already satisfied: jsonschema in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (4.19.1)
Requirement already satisfied: msgpack<2.0.0,>=1.0.0 in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (1.0.7)
Requirement already satisfied: protobuf!=3.19.5,>=3.15.3 in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (4.24.4)
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Requirement already satisfied: frozenlist in /home/blair/.local/lib/python3.10/site-packages (from ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (1.4.0)
Requirement already satisfied: tensorboardX>=1.9 in /home/blair/.local/lib/python3.10/site-packages (from ray[tune]>=2.2.0->neuralforecast) (2.6.2.2)
Requirement already satisfied: sympy in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (1.12)
Requirement already satisfied: networkx in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (3.1)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.1.105 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (12.1.105)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.1.105 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (12.1.105)
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Requirement already satisfied: nvidia-cudnn-cu12==8.9.2.26 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (8.9.2.26)
Requirement already satisfied: nvidia-cublas-cu12==12.1.3.1 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (12.1.3.1)
Requirement already satisfied: nvidia-cufft-cu12==11.0.2.54 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (11.0.2.54)
Requirement already satisfied: nvidia-curand-cu12==10.3.2.106 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (10.3.2.106)
Requirement already satisfied: nvidia-cusolver-cu12==11.4.5.107 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (11.4.5.107)
Requirement already satisfied: nvidia-cusparse-cu12==12.1.0.106 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (12.1.0.106)
Requirement already satisfied: nvidia-nccl-cu12==2.18.1 in /home/blair/.local/lib/python3.10/site-packages (from torch>=2.0.0->neuralforecast) (2.18.1)
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Requirement already satisfied: nvidia-nvjitlink-cu12 in /home/blair/.local/lib/python3.10/site-packages (from nvidia-cusolver-cu12==11.4.5.107->torch>=2.0.0->neuralforecast) (12.2.140)
Requirement already satisfied: attrs>=17.3.0 in /home/blair/.local/lib/python3.10/site-packages (from aiohttp->datasetsforecast) (23.1.0)
Requirement already satisfied: charset-normalizer<4.0,>=2.0 in /home/blair/.local/lib/python3.10/site-packages (from aiohttp->datasetsforecast) (3.3.0)
Requirement already satisfied: multidict<7.0,>=4.5 in /home/blair/.local/lib/python3.10/site-packages (from aiohttp->datasetsforecast) (6.0.4)
Requirement already satisfied: async-timeout<5.0,>=4.0.0a3 in /home/blair/.local/lib/python3.10/site-packages (from aiohttp->datasetsforecast) (4.0.3)
Requirement already satisfied: yarl<2.0,>=1.0 in /home/blair/.local/lib/python3.10/site-packages (from aiohttp->datasetsforecast) (1.9.2)
Requirement already satisfied: llvmlite<0.42,>=0.41.0dev0 in /home/blair/.local/lib/python3.10/site-packages (from numba->neuralforecast) (0.41.0)
Requirement already satisfied: alembic>=1.5.0 in /home/blair/.local/lib/python3.10/site-packages (from optuna->neuralforecast) (1.12.0)
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Requirement already satisfied: sqlalchemy>=1.3.0 in /home/blair/.local/lib/python3.10/site-packages (from optuna->neuralforecast) (2.0.22)
Requirement already satisfied: idna<4,>=2.5 in /home/blair/.local/lib/python3.10/site-packages (from requests->datasetsforecast) (3.4)
Requirement already satisfied: urllib3<3,>=1.21.1 in /home/blair/.local/lib/python3.10/site-packages (from requests->datasetsforecast) (2.0.6)
Requirement already satisfied: certifi>=2017.4.17 in /home/blair/.local/lib/python3.10/site-packages (from requests->datasetsforecast) (2023.7.22)
Requirement already satisfied: Mako in /home/blair/.local/lib/python3.10/site-packages (from alembic>=1.5.0->optuna->neuralforecast) (1.2.4)
Requirement already satisfied: antlr4-python3-runtime<4.12,>=4.11.1 in /home/blair/.local/lib/python3.10/site-packages (from fugue-sql-antlr>=0.1.6->fugue>=0.8.1->datasetsforecast) (4.11.1)
Requirement already satisfied: six>=1.5 in /usr/lib/python3/dist-packages (from python-dateutil>=2.8.2->pandas>=1.3.5->neuralforecast) (1.16.0)
Requirement already satisfied: greenlet!=0.4.17 in /home/blair/.local/lib/python3.10/site-packages (from sqlalchemy>=1.3.0->optuna->neuralforecast) (3.0.0)
Requirement already satisfied: fs in /home/blair/.local/lib/python3.10/site-packages (from triad>=0.9.1->fugue>=0.8.1->datasetsforecast) (2.4.16)
Requirement already satisfied: MarkupSafe>=2.0 in /home/blair/.local/lib/python3.10/site-packages (from jinja2->fugue>=0.8.1->datasetsforecast) (2.1.3)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /home/blair/.local/lib/python3.10/site-packages (from jsonschema->ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (2023.7.1)
Requirement already satisfied: referencing>=0.28.4 in /home/blair/.local/lib/python3.10/site-packages (from jsonschema->ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (0.30.2)
Requirement already satisfied: rpds-py>=0.7.1 in /home/blair/.local/lib/python3.10/site-packages (from jsonschema->ray>=2.2.0->ray[tune]>=2.2.0->neuralforecast) (0.10.6)
Requirement already satisfied: mpmath>=0.19 in /home/blair/.local/lib/python3.10/site-packages (from sympy->torch>=2.0.0->neuralforecast) (1.3.0)
Requirement already satisfied: appdirs~=1.4.3 in /home/blair/.local/lib/python3.10/site-packages (from fs->triad>=0.9.1->fugue>=0.8.1->datasetsforecast) (1.4.4)
Requirement already satisfied: setuptools in /usr/lib/python3/dist-packages (from fs->triad>=0.9.1->fugue>=0.8.1->datasetsforecast) (59.6.0)
```

In [6]:
```
import pandas as pd
from datasetsforecast.long_horizon import LongHorizon
from neuralforecast.models import NBEATS
```

In [3]:
```
df_ETTm2, _, _ = LongHorizon.load(directory='./', group='ETTm2')
df_Exchange, _, _ = LongHorizon.load(directory='./', group='Exchange')
df_ECL, _, _ = LongHorizon.load(directory='./', group='ECL')
df_TrafficL, _, _ = LongHorizon.load(directory='./', group='TrafficL')
df_Weather, _, _ = LongHorizon.load(directory='./', group='Weather')
df_ILI, _, _ = LongHorizon.load(directory='./', group='ILI')
```

```
100%|██████████| 314M/314M [04:27<00:00, 1.18MiB/s]
INFO:datasetsforecast.utils:Successfully downloaded datasets.zip, 314116557, bytes.
INFO:datasetsforecast.utils:Decompressing zip file...
INFO:datasetsforecast.utils:Successfully decompressed longhorizon/datasets/datasets.zip
```

In [4]:
```
df_ETTm2.to_csv('raw_data/df_ETTm2.csv',index=False)
df_Exchange.to_csv('raw_data/df_Exchange.csv',index=False)
df_ECL.to_csv('raw_data/df_ECL.csv',index=False)
df_TrafficL.to_csv('raw_data/df_TrafficL.csv',index=False)
df_Weather.to_csv('raw_data/df_Weather.csv',index=False)
df_ILI.to_csv('raw_data/df_ILI.csv',index=False)
```

In [ ]:
```
model = NBEATS(h=96, input_size=480,
               loss=DistributionLoss(distribution='Poisson', level=[80, 90]),
               stack_types = ['identity', 'trend', 'seasonality'],
               max_steps=100,
               val_check_steps=10,
               early_stop_patience_steps=2)

fcst_ETTm2 = NeuralForecast(
    models=[model],
    freq='15min'
)

df_ETTm2['ds'] = pd.to_datetime(df_ETTm2['ds'])
n_time = len(df_ETTm2['ds'].unique())
val_size = int(0.1 * n_time)
test_size = int(0.2 * n_time)

fcst.fit(df=Y_train_df, static_df=AirPassengersStatic, val_size=val_size)
forecasts = fcst.predict(futr_df=Y_test_df)
```

In [5]:
```
# Create a dictionary to store DataFrames and their associated values
dfs = {
    'df_ETTm2': df_ETTm2,
    'df_Exchange': df_Exchange,
    'df_ECL': df_ECL,
    'df_TrafficL': df_TrafficL,
    'df_Weather': df_Weather,
    'df_ILI': df_ILI
}

for df_name, df in dfs.items():
    df['ds'] = pd.to_datetime(df['ds'])
    n_time = len(df['ds'].unique())
    val_size = int(0.1 * n_time)
    test_size = int(0.2 * n_time)
```

```
For DataFrame df_ETTm2:
n_time: 57600
val_size: 5760
test_size: 11520
For DataFrame df_Exchange:
n_time: 7588
val_size: 758
test_size: 1517
For DataFrame df_ECL:
n_time: 26304
val_size: 2630
test_size: 5260
For DataFrame df_TrafficL:
n_time: 17544
val_size: 1754
test_size: 3508
For DataFrame df_Weather:
n_time: 52695
val_size: 5269
test_size: 10539
For DataFrame df_ILI:
n_time: 966
val_size: 96
test_size: 193
```

In [ ]: