

prediction major world Indices for using GRU

Deep Learning for Financial Applications : A Survey에서의 기술을 접목시켰습니다.

과거의 데이터를 중심으로 주가를 예측하는 투자 전략으로 모멘텀 투자전략을 적용하였습니다. ¶

이 프로젝트에서 사용된 column은 볼린저 밴드, 이동평균선(Moving Average), 등 저희가 평소에 주식투자를 할 때 사용하는

후행성 보조지표를 사용하며, 또한 feature engineering을 통해서 새로운 column을 추가하였습니다.

In [70]:

```
!pip install IPython
```

```
Requirement already satisfied: IPython in /opt/conda/lib/python3.7/site-packages (7.27.0)
Requirement already satisfied: prompt-toolkit!=3.0.0,!=3.0.1,<3.1.0,>=2.0.0 in /opt/conda/lib/python3.7/site-packages (from IPython) (3.0.20)
Requirement already satisfied: pygments in /opt/conda/lib/python3.7/site-packages (from IPython) (2.10.0)
Requirement already satisfied: backcall in /opt/conda/lib/python3.7/site-packages (from IPython) (0.2.0)
Requirement already satisfied: jedi>=0.16 in /opt/conda/lib/python3.7/site-packages (from IPython) (0.18.0)
Requirement already satisfied: traitlets>=4.2 in /opt/conda/lib/python3.7/site-packages (from IPython) (5.1.0)
Requirement already satisfied: decorator in /opt/conda/lib/python3.7/site-packages (from IPython) (5.1.0)
Requirement already satisfied: setuptools>=18.5 in /opt/conda/lib/python3.7/site-packages (from IPython) (58.0.4)
Requirement already satisfied: pickleshare in /opt/conda/lib/python3.7/site-packages (from IPython) (0.7.5)
Requirement already satisfied: matplotlib-inline in /opt/conda/lib/python3.7/site-packages (from IPython) (0.1.3)
Requirement already satisfied: pexpect>4.3 in /opt/conda/lib/python3.7/site-packages (from IPython) (4.8.0)
Requirement already satisfied: parso<0.9.0,>=0.8.0 in /opt/conda/lib/python3.7/site-packages (from jedi>=0.16->IPython) (0.8.2)
Requirement already satisfied: ptyprocess>=0.5 in /opt/conda/lib/python3.7/site-packages (from pexpect>4.3->IPython) (0.7.0)
Requirement already satisfied: wcwidth in /opt/conda/lib/python3.7/site-packages (from prompt-toolkit!=3.0.0,!=3.0.1,<3.1.0,>=2.0.0->IPython) (0.2.5)
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv
```

In [1]:

```
!pip install finance-datareader
```

Collecting finance-datareader

 Downloading finance_datareader-0.9.31-py3-none-any.whl (17 kB)

Requirement already satisfied: requests>=2.3.0 in /opt/conda/lib/python3.7/site-packages (from finance-datareader) (2.25.1)

Requirement already satisfied: pandas>=0.19.2 in /opt/conda/lib/python3.7/site-packages (from finance-datareader) (1.3.4)

Collecting requests-file

 Downloading requests_file-1.5.1-py2.py3-none-any.whl (3.7 kB)

Requirement already satisfied: lxml in /opt/conda/lib/python3.7/site-packages (from finance-datareader) (4.6.3)

Requirement already satisfied: tqdm in /opt/conda/lib/python3.7/site-packages (from finance-datareader) (4.62.3)

Requirement already satisfied: numpy>=1.17.3 in /opt/conda/lib/python3.7/site-packages (from pandas>=0.19.2>finance-datareader) (1.19.5)

Requirement already satisfied: python-dateutil>=2.7.3 in /opt/conda/lib/python3.7/site-packages (from pandas>=0.19.2>finance-datareader) (2.8.0)

Requirement already satisfied: pytz>=2017.3 in /opt/conda/lib/python3.7/site-packages (from pandas>=0.19.2>finance-datareader) (2021.1)

Requirement already satisfied: six>=1.5 in /opt/conda/lib/python3.7/site-packages (from python-dateutil>=2.7.3>pandas>=0.19.2>finance-datareader) (1.16.0)

Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/lib/python3.7/site-packages (from requests>=2.3.0>finance-datareader) (2021.10.8)

Requirement already satisfied: chardet<5,>=3.0.2 in /opt/conda/lib/python3.7/site-packages (from requests>=2.3.0>finance-datareader) (4.0.0)

Requirement already satisfied: urllib3<1.27,>=1.21.1 in /opt/conda/lib/python3.7/site-packages (from requests>=2.3.0>finance-datareader) (1.26.6)

Requirement already satisfied: idna<3,>=2.5 in /opt/conda/lib/python3.7/site-packages (from requests>=2.3.0>finance-datareader) (2.10)

Installing collected packages: requests-file, finance-datareader

Successfully installed finance-datareader-0.9.31 requests-file-1.5.1

WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: <https://pip.pypa.io/warnings/venv>

In [71]:

```
import numpy as np
import pandas as pd
import os
import FinanceDataReader as fdr
from tqdm import tqdm
import matplotlib.pyplot as plt
import seaborn as sns
from IPython.display import Image

from sklearn.base import BaseEstimator, TransformerMixin
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import MinMaxScaler

# from neuralprophet import NeuralProphet
from sklearn.ensemble import RandomForestRegressor, AdaBoostRegressor, BaggingRegressor
from sklearn.model_selection import train_test_split, StratifiedKFold, KFold
from sklearn.metrics import mean_squared_error, accuracy_score
from lightgbm import LGBMRegressor
from sklearn.linear_model import Lasso
from xgboost import XGBRegressor

import torch
from torchvision import datasets
from torch.utils.data import DataLoader, Dataset

import warnings
warnings.filterwarnings(action='ignore')
```

In [3]:

```
pd.set_option('display.max_column', None)
```

Data set

In [4]:

```
stock_name = ['KOSPI200', 'SNP500', 'NASDAQ', 'KOSDAQ', 'DOWJONES']
stock_code = ['KS200', 'US500', 'IXIC', 'KQ11', 'DJI']
```

In [5]:

```
for i in range(len(stock_code)):
    start_date = '2011-01-01'
    end_date = '2021-10-31'
    stock_name[i] = fdr.DataReader(stock_code[i], start=start_date, end=end_date)[
        ['Close', 'Open', 'High', 'Low', 'Volume', 'Change']]
```

train set :2011.01.01 ~ 2021.10.1

test set : 2021.10.4 ~ 2021.10.29

target : 2021.11.01 ~ 2021.11.26

In [6]:

```
KOSPI200 = stock_name[0]
SNP500 = stock_name[1]
NASDAQ = stock_name[2]
KOSDAQ = stock_name[3]
US30 = stock_name[4]
```

In [7]:

```
print('KOSPI200\n',KOSPI200)
print('S&P500\n',SNP500)
print('NASDAQ\n',NASDAQ)
print('KOSDAQ\n',KOSDAQ)
print('US30\n',US30)
```

KOSPI200

	Close	Open	High	Low	Volume	Change
Date						
2011-01-03	273.81	272.84	273.81	271.63	100080.0	0.0097
2011-01-04	275.78	274.29	275.78	273.69	113810.0	0.0072
2011-01-05	275.35	275.37	275.94	274.57	127210.0	-0.0016
2011-01-06	274.72	276.91	277.13	273.08	143230.0	-0.0023
2011-01-07	275.61	274.00	275.61	273.24	113110.0	0.0032
...
2021-10-25	395.01	392.45	395.99	390.02	152060000.0	0.0042
2021-10-26	399.07	397.75	399.67	396.28	135400000.0	0.0103
2021-10-27	395.48	398.31	398.82	394.41	193850000.0	-0.0090
2021-10-28	393.89	394.87	397.79	393.89	180650000.0	-0.0040
2021-10-29	388.47	396.08	396.92	387.82	146470000.0	-0.0138

[2668 rows x 6 columns]

S&P500

	Close	Open	High	Low	Volume	Change
Date						
2011-01-03	1271.87	1257.62	1276.17	1257.62	0.0	0.0113
2011-01-04	1270.20	1272.95	1274.12	1262.66	0.0	-0.0013
2011-01-05	1276.56	1268.78	1277.63	1265.36	0.0	0.0050
2011-01-06	1273.85	1276.29	1278.17	1270.43	0.0	-0.0021
2011-01-07	1271.50	1274.41	1276.83	1261.70	0.0	-0.0018
...
2021-10-25	4566.48	4553.69	4572.62	4537.36	0.0	0.0047
2021-10-26	4574.79	4578.69	4598.53	4569.17	0.0	0.0018
2021-10-27	4551.68	4580.22	4584.57	4551.66	0.0	-0.0051
2021-10-28	4596.42	4562.84	4597.55	4562.84	0.0	0.0098
2021-10-29	4605.38	4572.87	4608.08	4567.59	0.0	0.0019

[2726 rows x 6 columns]

NASDAQ

	Close	Open	High	Low	Volume	Change
Date						
2011-01-03	2691.52	2676.65	2704.86	2676.34	4.462900e+08	0.0146
2011-01-04	2681.25	2699.86	2700.88	2663.64	4.726800e+08	-0.0038
2011-01-05	2702.20	2673.91	2702.20	2671.89	4.668700e+08	0.0078
2011-01-06	2709.89	2704.38	2712.35	2697.73	4.738500e+08	0.0028
2011-01-07	2703.17	2712.75	2715.96	2676.36	4.623800e+08	-0.0025
...
2021-10-25	15226.71	15142.92	15259.63	15070.75	1.090000e+09	0.0090
2021-10-26	15235.71	15317.50	15384.00	15198.23	1.220000e+09	0.0006
2021-10-27	15235.84	15276.00	15364.54	15235.84	1.090000e+09	0.0000
2021-10-28	15448.12	15304.74	15452.30	15290.31	1.060000e+09	0.0139
2021-10-29	15498.39	15323.29	15504.12	15323.29	1.060000e+09	0.0033

[2726 rows x 6 columns]

KOSDAQ

	Close	Open	High	Low	Volume	Change
Date						
2011-01-03	518.05	515.71	518.06	514.51	5.797600e+05	0.0144
2011-01-04	521.35	520.74	522.34	519.29	7.269300e+05	0.0064
2011-01-05	523.81	522.16	524.41	519.93	6.404300e+05	0.0047
2011-01-06	527.64	527.82	529.87	524.44	7.939000e+05	0.0073
2011-01-07	530.84	530.75	531.28	529.87	6.574500e+05	0.0061
...
2021-10-25	994.31	994.75	995.39	986.55	1.060000e+09	-0.0008
2021-10-26	1011.76	1000.32	1011.76	1000.29	1.330000e+09	0.0175
2021-10-27	1008.95	1012.91	1013.17	1006.03	1.270000e+09	-0.0028
2021-10-28	1000.13	1008.93	1011.50	999.59	1.310000e+09	-0.0087

```
2021-10-29  992.33  1004.91  1005.19  991.03  1.320000e+09 -0.0078
```

[2669 rows x 6 columns]

US30

Date	Close	Open	High	Low	Volume	Change
2011-01-03	11670.75	11577.43	11711.47	11577.35	203420000.0	0.0081
2011-01-04	11691.18	11670.90	11698.22	11635.74	178630000.0	0.0018
2011-01-05	11722.89	11688.61	11742.68	11652.89	169990000.0	0.0027
2011-01-06	11697.31	11716.93	11736.74	11667.46	193080000.0	-0.0022
2011-01-07	11674.76	11696.86	11726.94	11599.68	188720000.0	-0.0019
...
2021-10-25	35741.15	35692.62	35787.04	35629.37	270410000.0	0.0018
2021-10-26	35756.88	35791.05	35892.92	35734.73	321910000.0	0.0004
2021-10-27	35490.69	35835.43	35835.43	35490.43	358080000.0	-0.0074
2021-10-28	35730.48	35545.41	35742.25	35545.41	348430000.0	0.0068
2021-10-29	35819.56	35712.28	35852.53	35633.20	407990000.0	0.0025

[2726 rows x 6 columns]

EDA

- 표본탐색: KOSPI200

In [8]:

```
KOSPI200.info()
```

```
<class 'pandas.core.frame.DataFrame'>
DatetimeIndex: 2668 entries, 2011-01-03 to 2021-10-29
Data columns (total 6 columns):
 #   Column  Non-Null Count  Dtype  
--- 
 0   Close    2668 non-null   float64
 1   Open     2668 non-null   float64
 2   High     2668 non-null   float64
 3   Low      2668 non-null   float64
 4   Volume   2668 non-null   float64
 5   Change   2668 non-null   float64
dtypes: float64(6)
memory usage: 145.9 KB
```

In [9]:

```
KOSPI200.describe()
```

Out [9]:

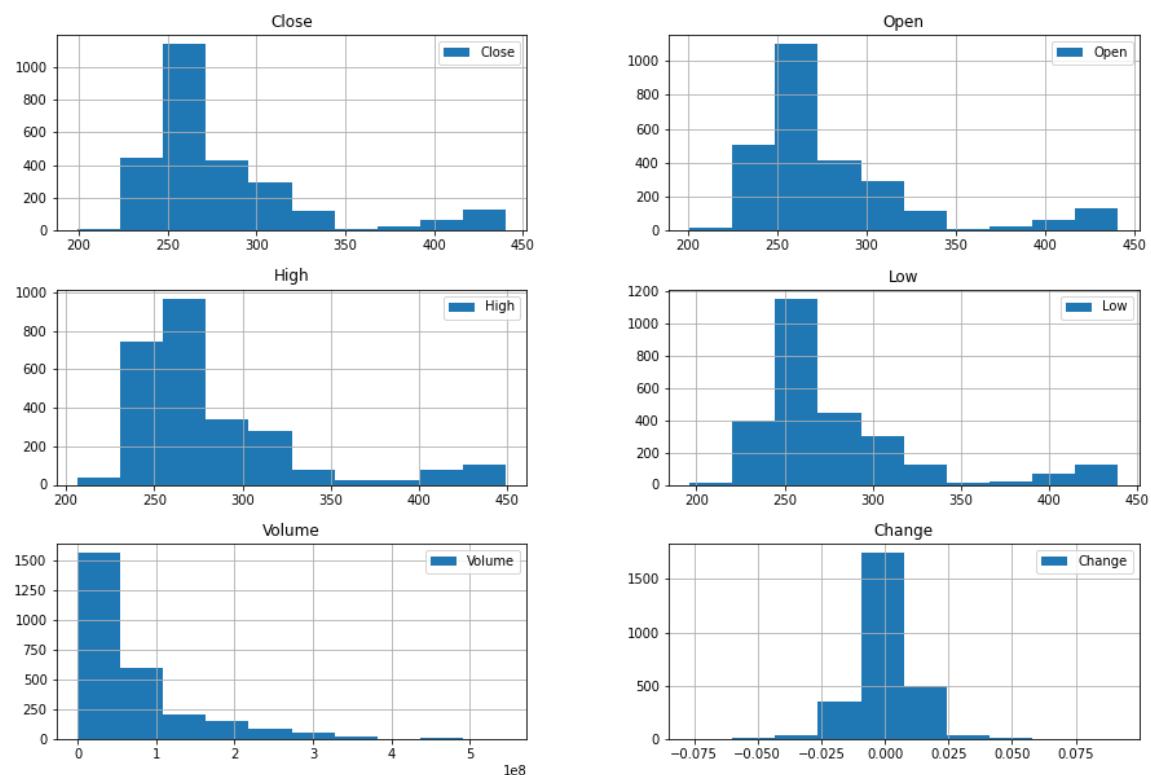
	Close	Open	High	Low	Volume	Change
count	2668.000000	2668.000000	2668.000000	2668.000000	2.668000e+03	2668.000000
mean	281.132241	281.262294	282.745214	279.484925	5.616599e+07	0.000196
std	47.881437	47.903847	48.262141	47.561666	8.321467e+07	0.010989
min	199.280000	200.800000	206.660000	196.270000	3.691000e+04	-0.076700
25%	251.585000	251.650000	252.757500	250.305000	7.230750e+04	-0.005000
50%	264.445000	264.545000	265.890000	262.980000	1.136150e+05	0.000400
75%	293.822500	294.055000	295.550000	292.137500	9.114750e+07	0.005825
max	440.400000	440.780000	449.040000	438.750000	5.457800e+08	0.091500

In [10]:

```
KOSPI200.hist(figsize=(15,10), legend=True)
```

Out [10]:

```
array([ [,  
         <AxesSubplot:title={'center':'Open'}>],  
       [,  
        <AxesSubplot:title={'center':'Low'}>],  
       [,  
        <AxesSubplot:title={'center':'Change'}>]], dtype=object)
```



Close And Volume

In [11]:

```
Close = KOSPI200.Close  
Volume = KOSPI200.Volume  
Close_Vol = pd.concat([Close,Volume],axis=1)  
scaler = StandardScaler()  
scaler_ = pd.DataFrame(scaler.fit_transform(Close_Vol))
```

In [12]:

```
scaler_.columns = ['Close', 'Volume']  
scaler_
```

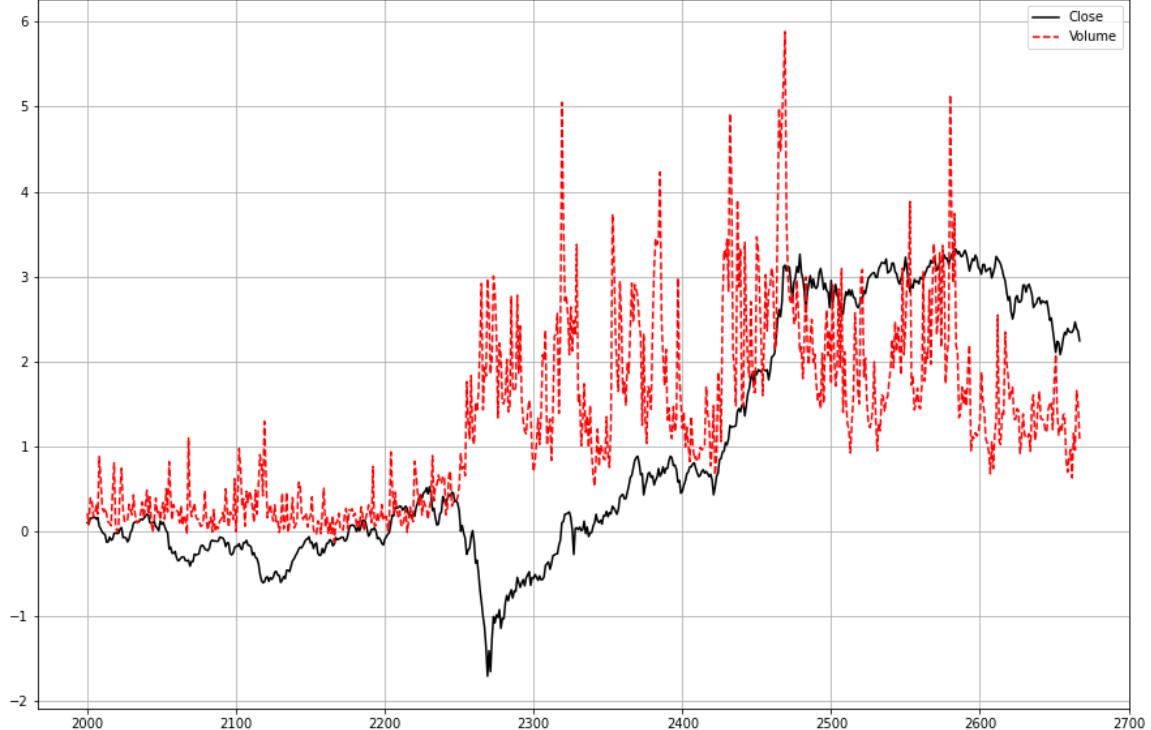
Out[12]:

	Close	Volume
0	-0.152953	-0.673877
1	-0.111802	-0.673712
2	-0.120784	-0.673551
3	-0.133944	-0.673358
4	-0.115353	-0.673720
...
2663	2.378774	1.152585
2664	2.463582	0.952342
2665	2.388592	1.654874
2666	2.355378	1.496219
2667	2.242161	1.085397

2668 rows × 2 columns

In [13]:

```
plt.figure(figsize=(15,10))
plt.plot(scaler_[2000:].Close,label='Close',color='black')
plt.plot(scaler_[2000:].Volume,label='Volume',ls='--',color='red')
plt.grid()
plt.legend()
plt.show()
```



Feature Engineering

- 표본탐색: KOSPI200
- Correlation

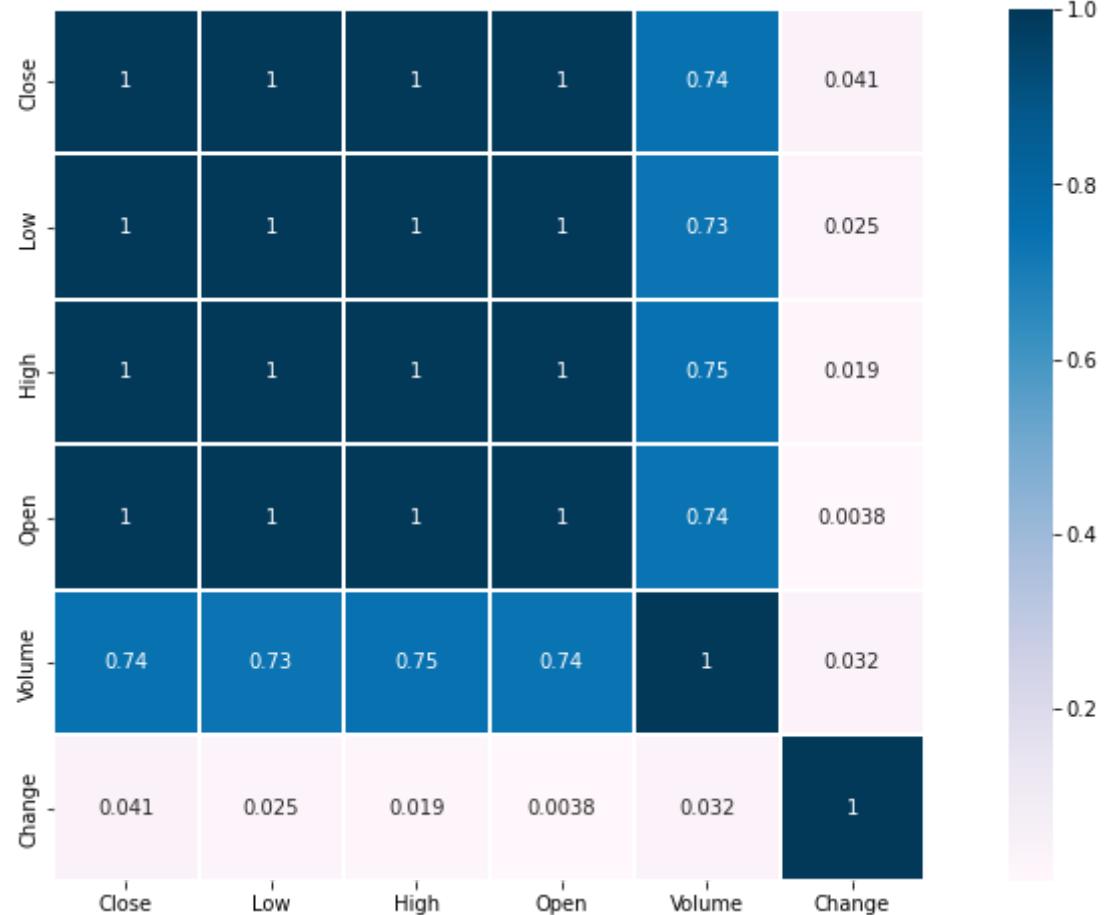
target(Close)를 중심으로 feature engineering

In [14]:

```
corr_data = KOSPI200[KOSPI200.keys()]
colormap = plt.cm.PuBu
cols = corr_data.corr().nlargest(6, 'Close')['Close'].index
print(cols)
cm = np.corrcoef(KOSPI200[cols].values.T)
f, ax = plt.subplots(figsize = (15,8))
plt.title('Correlation of Numeric Features with Close Indices',y=1,size=18)
heatmap = sns.heatmap(cm, vmax=1, linewidths=0.1,square=True,annot=True,cmap=colormap, linecolor="white",xticklabels = cols.values ,yticklabels = cols.values)
```

Index(['Close', 'Low', 'High', 'Open', 'Volume', 'Change'], dtype='object')

Correlation of Numeric Features with Close Indices



In [15]:

```
KOSPI200.keys()
```

Out[15]:

Index(['Close', 'Open', 'High', 'Low', 'Volume', 'Change'], dtype='object')

Moving Average

In [16]:

```
class MA(BaseEstimator,TransformerMixin):
    def __init__(self):
        pass
    def fit(self,x,y):
        return self
    def transform(self,x):
        x['MA5'] = x['Close'].rolling(window=5).mean()
        x['MA10'] = x['Close'].rolling(window=10).mean()
        x['MA20'] = x['Close'].rolling(window=20).mean()
        x['MA60'] = x['Close'].rolling(window=60).mean()
        x['MA120'] = x['Close'].rolling(window=120).mean()
        return x

class VMA(BaseEstimator, TransformerMixin):
    def __init__(self):
        pass
    def fit(self,x,y=None):
        return self
    def transform(self,x):
        x['VMA5'] = x['Volume'].rolling(window=5).mean()
        x['VMA10'] = x['Volume'].rolling(window=10).mean()
        x['VMA20'] = x['Volume'].rolling(window=20).mean()
        x['VMA60'] = x['Volume'].rolling(window=60).mean()
        x['VMA120'] = x['Volume'].rolling(window=120).mean()
        return x

class bolinger(BaseEstimator,TransformerMixin):
    def __init__(self):
        pass
    def fit(self,x,y):
        return self
    def transform(self,x):
        x['std'] = x['Close'].rolling(window=20).std()
        x['20_Upper'] = x['MA20'] + 2 * x['std']
        x['20_Lower'] = x['MA20'] - 2 * x['std']
        x.drop('std',axis=1,inplace=True)
        x.dropna(inplace=True)
        return x

class Close_MA(BaseEstimator,TransformerMixin):
    def __init__(self):
        pass
    def fit(self,x,y):
        return self
    def transform(self,x):
        x['Close_MA5'] = x['Close'] / x['MA5']
        x['Close_MA10'] = x['Close'] / x['MA10']
        x['Close_MA20'] = x['Close'] / x['MA20']
        x['Close_MA60'] = x['Close'] / x['MA60']
        x['Close_MA120'] = x['Close'] / x['MA120']
        return x

class Close_Vol(BaseEstimator,TransformerMixin):
    def __init__(self):
        pass
    def fit(self,x,y):
        return self
    def transform(self,x):
        x['Volume_MA5'] = x['Volume'] / x['VMA5']
```

```
x['Volume_MA10'] = x['Volume'] / x['VMA10']
x['Volume_MA20'] = x['Volume'] / x['VMA20']
x['Volume_MA60'] = x['Volume'] / x['VMA60']
x['Volume_MA120'] = x['Volume'] / x['VMA120']
return x
```

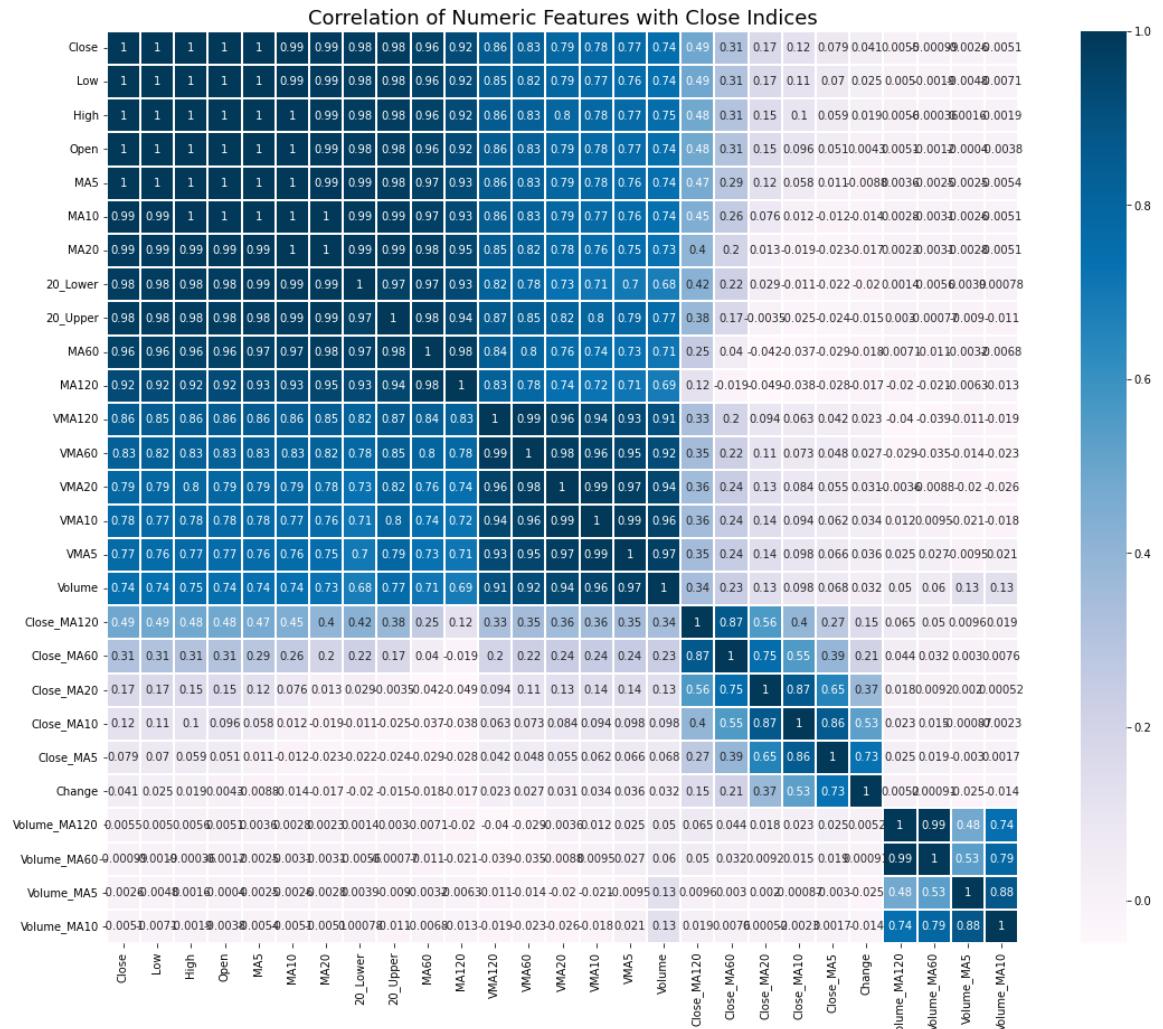
In [17]:

```
data_pipeline = Pipeline([
    ('MA',MA()),
    ('VMA',VMA()),
    ('Bolinger',bolinger()),
    ('Close_MA',Close_MA()),
    ('Close_Vol',Close_Vol()),
])
KOSPI200 = data_pipeline.transform(KOSPI200)
SNP500 = data_pipeline.transform(SNP500)
KOSDAQ = data_pipeline.transform(KOSDAQ)
US30 = data_pipeline.transform(US30)
NASDAQ = data_pipeline.transform(NASDAQ)
```

In [18]:

```
corr_data = KOSPI200[KOSPI200.keys()]
colormap = plt.cm.PuBu
k = len(KOSPI200.keys())-1
cols = corr_data.corr().nlargest(k, 'Close')['Close'].index
print(cols)
cm = np.corrcoef(KOSPI200[cols].values.T)
f , ax = plt.subplots(figsize = (20,15))
plt.title('Correlation of Numeric Features with Close Indices',y=1,size=18)
heatmap = sns.heatmap(cm, vmax=1, linewidths=0.1,square=True,annot=True,cmap=colormap, linecolor="white",xticklabels = cols.values ,yticklabels = cols.values)
plt.savefig('heatmap.png')
```

```
Index(['Close', 'Low', 'High', 'Open', 'MA5', 'MA10', 'MA20', '20_Lower',
       '20_Upper', 'MA60', 'MA120', 'VMA120', 'VMA60', 'VMA20', 'VMA10',
       'VMA5', 'Volume', 'Close_MA120', 'Close_MA60', 'Close_MA20',
       'Close_MA10', 'Close_MA5', 'Change', 'Volume_MA120', 'Volume_MA60',
       'Volume_MA5', 'Volume_MA10'],
      dtype='object')
```



In [19]:

```
US30.isna().sum()
```

Out [19]:

```
Close      0
Open       0
High       0
Low        0
Volume     0
Change     0
MA5        0
MA10       0
MA20       0
MA60       0
MA120      0
VMA5       0
VMA10      0
VMA20      0
VMA60      0
VMA120     0
20_Upper   0
20_Lower   0
Close_MA5  0
Close_MA10 0
Close_MA20 0
Close_MA60 0
Close_MA120 0
Volume_MA5 0
Volume_MA10 0
Volume_MA20 0
Volume_MA60 0
Volume_MA120 0
dtype: int64
```

Visualization for key features

In [20]:

```
def plot_MA(data):
    %matplotlib inline
    plt.figure(figsize=(30,10))
    plt.rc('font',size=20)
    plt.plot(data['Close'],label='Close')
    plt.plot(data['MA5'],label='MA5')
    plt.plot(data['MA10'],label='MA10')
    plt.plot(data['MA20'],label='MA20')
    plt.plot(data['MA60'],label='MA60')
    plt.plot(data['MA120'],label='MA120')
    plt.xlabel('Year')
    plt.ylabel('Indics')
    plt.legend(fontsize=30)
    plt.grid(True)
    return plt.show()
```

In [21]:

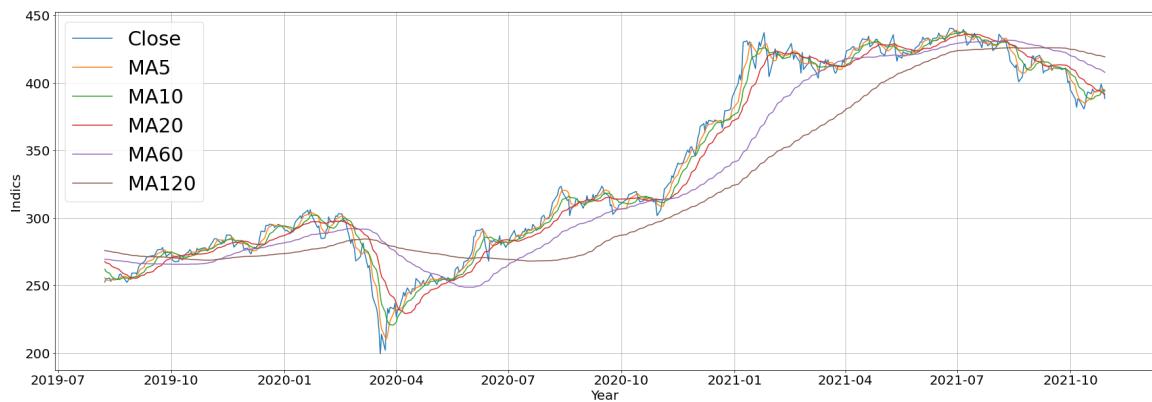
```
def plot_VMA(data):
    %matplotlib inline
    plt.figure(figsize=(30,10))
    plt.rc('font',size=20)
    plt.plot(data['Volume'],label='Volume')
    plt.plot(data['VMA5'],label='VMA5')
    plt.plot(data['VMA10'],label='VMA10')
    plt.plot(data['VMA20'],label='VMA20')
    plt.plot(data['VMA60'],label='VMA60')
    plt.plot(data['VMA120'],label='VMA120')
    plt.ylabel('Volume')
    plt.xlabel('year')
    plt.legend(fontsize=30)
    plt.grid(True)
    return plt.show()
```

In [22]:

```
def bol_plot(data):
    plt.figure(figsize=(30,10))
    plt.rc('font',size=20)
    plt.plot(data['Close'],color='black',label='Close_price')
    plt.plot(data['20_Upper'],ls='--',color='red',label='Upper Band')
    plt.plot(data['20_Lower'],ls='--',color='blue',label='Lower Band')
    plt.xlabel('Date')
    plt.ylabel('Indics')
    plt.legend()
    plt.grid(True)
    return plt.show()
```

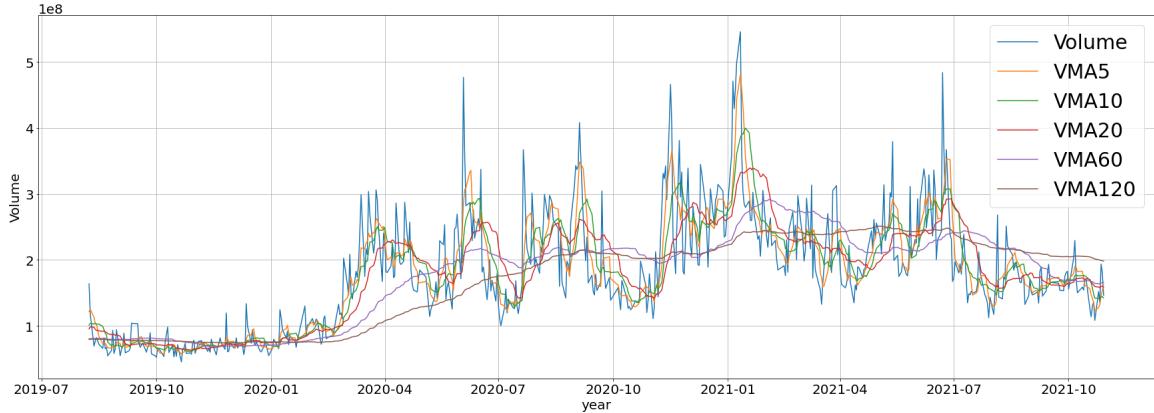
In [23]:

```
plot_MA(KOSPI200[2000:])
```



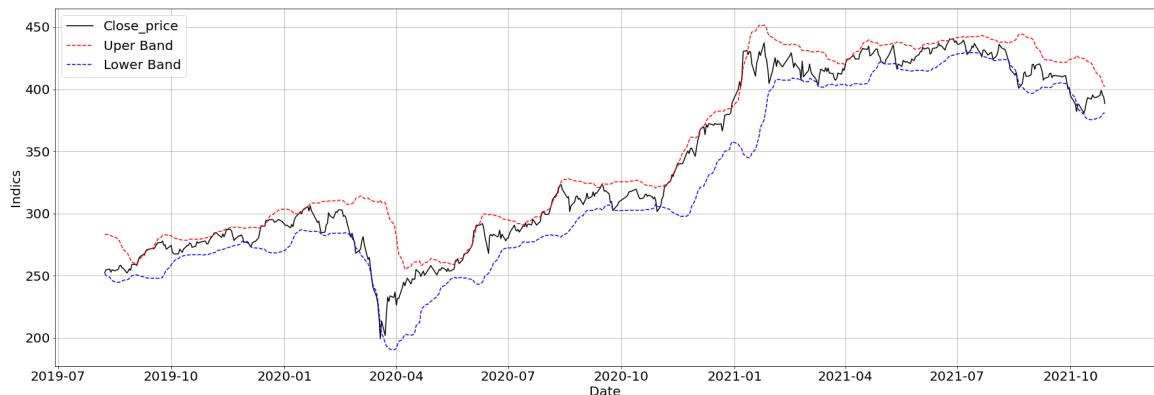
In [24]:

```
plot_VMA(KOSPI200[2000:])
```



In [25]:

```
bol_plot(KOSPI200[2000:])
```



ML Dataset

In [26]:

```
NASDAQ.keys()
```

Out [26]:

```
Index(['Close', 'Open', 'High', 'Low', 'Volume', 'Change', 'MA5', 'MA10',
       'MA20', 'MA60', 'MA120', 'VMA5', 'VMA10', 'VMA20', 'VMA60', 'VMA120',
       '20_Upper', '20_Lower', 'Close_MA5', 'Close_MA10', 'Close_MA20',
       'Close_MA60', 'Close_MA120', 'Volume_MA5', 'Volume_MA10', 'Volume_MA20',
       'Volume_MA60', 'Volume_MA120'],
      dtype='object')
```

In [27]:

```
scaler = MinMaxScaler(feature_range=(0,1))
```

In [28]:

```
def ML_data_preprocessing(data):
    data.drop(['Volume','Volume_MA5','Volume_MA10','Volume_MA20','Volume_MA60','Volume_MA120','Change'],axis=1,inplace=True)
    ML_dataname_train, ML_dataname_test = data[:-20],data[-20:]
    ML_dataname_train.reset_index(drop=True,inplace=True)
    ML_dataname_test.reset_index(drop=True,inplace=True)
    ML_dataname_train_target = ML_dataname_train.Close.iloc[20:]
    ML_dataname_train = ML_dataname_train.iloc[0:-20]
    return ML_dataname_train, ML_dataname_train_target,ML_dataname_test
```

In [29]:

```
ML_KOSPI200_train,ML_KOSPI200_target,ML_KOSPI200_test = ML_data_preprocessing(KOSPI200)
ML_SNP500_train,ML_SNP500_target,ML_SNP500_test = ML_data_preprocessing(SNP500)
ML_NASDAQ_train,ML_NASDAQ_target,ML_NASDAQ_test = ML_data_preprocessing(NASDAQ)
ML_KOSDAQ_train,ML_KOSDAQ_target,ML_KOSDAQ_test = ML_data_preprocessing(KOSDAQ)
ML_US30_train,ML_US30_target,ML_US30_test = ML_data_preprocessing(US30)
```

In [30]:

```
print(ML_KOSDAQ_train.shape,ML_KOSDAQ_target.shape,ML_KOSDAQ_test.shape)
```

```
(2510, 21) (2510,) (20, 21)
```

In [31]:

```
def ML_MAPELoss(output,target):
    return np.mean(np.abs((target - output)/ target))
```

In [32]:

```
def ML_NMAE(pred,target):
    return abs(target - pred).sum() / (abs(target).sum()) * 100
```

In [33]:

```
def indices_binarizer(target,prediction):
    target_result = []
    prediction_result = []
    for i,indices in enumerate(target):
        if i == 0:
            target_result.append(0)
            data = indices
        if indices >= data:
            pred = 1
            target_result.append(pred)
            data = indices
        if indices < data:
            pred = 0
            target_result.append(pred)
            data = indices
    for i,indices in enumerate(prediction):
        if i == 0:
            prediction_result.append(0)
            pred_data = indices
        if indices >= data:
            pred = 1
            prediction_result.append(pred)
            pred_data = indices
        if indices < data:
            pred = 0
            prediction_result.append(pred)
            pred_data = indices
    return target_result, prediction_result
```

ML models

In [34]:

```
ML_KOSPI200_train
```

Out [34]:

	Close	Open	High	Low	MA5	MA10	MA20	MA60	MA120	
0	270.41	274.37	275.59	270.41	271.242	269.888	272.9180	279.301667	273.936917	
1	274.61	275.33	275.47	273.06	272.022	269.896	272.5105	279.199667	273.943583	
2	275.17	275.82	276.08	274.02	273.188	270.525	272.1315	279.119000	273.938500	
3	278.77	277.90	279.69	277.34	274.080	271.780	272.1320	279.064667	273.967000	
4	281.67	281.28	282.85	281.13	276.126	273.508	272.2735	279.070000	274.024917	
...
2504	404.58	404.32	407.82	401.63	406.998	415.838	422.8735	430.093833	425.668750	18
2505	412.48	408.47	412.94	408.26	407.232	413.921	422.1240	429.836667	425.654667	18
2506	413.95	414.01	416.03	410.63	407.350	412.460	421.4105	429.563833	425.670917	17
2507	410.38	414.49	415.74	409.79	408.434	411.024	420.4720	429.234333	425.687917	17
2508	410.24	408.63	411.79	406.81	410.326	409.810	419.5095	428.840500	425.725000	16

2509 rows × 21 columns

◀ ▶

In [37]:

```
def RF_model(x_train,y_train,x_test):  
    rf_models = []  
    rf_result = []  
    kf = KFold(n_splits=5)  
    fold = 1  
    for train_idx,valid_idx in kf.split(x_train,y_train):  
        train_x = x_train.values[train_idx]  
        train_y = y_train.values[train_idx]  
        val_x = x_train.values[valid_idx]  
        val_y = y_train.values[valid_idx]  
        print(f"-----fold:{fold}-----")  
        rf_model = BaggingRegressor(RandomForestRegressor(n_estimators=50,  
                                                        random_state=0),oob_score=True,verbose=False)  
        rf_model.fit(train_x,train_y)  
        prediction = rf_model.predict(val_x)  
        label, y_hat = indices_binarizer(val_y,prediction)  
        print(f'Accuracy score:{accuracy_score(label,y_hat)}')  
        score = ML_MAPELoss(prediction,val_y)  
        print(f"MAPE:{score}")  
        rf_models.append(rf_model)  
        fold += 1  
    for model in rf_models:  
        pred = model.predict(x_test)  
        rf_result.append(pred)  
    rf_pred = np.mean(rf_result,axis=0)  
    return rf_pred
```

In [38]:

```
print('-----KOSPI200-----')
rf_KOSPI200_pred = RF_model(ML_KOSPI200_train,ML_KOSPI200_target,ML_KOSPI200_test)
print('-----S&P500-----')
rf_SNP500_pred = RF_model(ML_SNP500_train,ML_SNP500_target,ML_SNP500_test)
print('-----KOSDAQ-----')
rf_KOSDAQ_pred = RF_model(ML_KOSDAQ_train,ML_KOSDAQ_target,ML_KOSDAQ_test)
print('-----NASDAQ-----')
rf_NASDAQ_pred = RF_model(ML_NASDAQ_train,ML_NASDAQ_target,ML_NASDAQ_test)
print('-----US30-----')
rf_US30_pred = RF_model(ML_US30_train,ML_US30_target,ML_US30_test)
print('End Training')
```

-----KOSPI200-----
-----fold:1-----
Accuracy score:0.47713717693836977
MAPE:0.03986646465125885
-----fold:2-----
Accuracy score:0.5129224652087475
MAPE:0.032650957757300154
-----fold:3-----
Accuracy score:0.4572564612326044
MAPE:0.053765965923226924
-----fold:4-----
Accuracy score:0.510934393638171
MAPE:0.0971097007220273
-----fold:5-----
Accuracy score:0.4302788844621514
MAPE:0.14682970301643772
-----S&P500-----
-----fold:1-----
Accuracy score:0.4679611650485437
MAPE:0.21696918751747585
-----fold:2-----
Accuracy score:0.5203883495145631
MAPE:0.04305137762755663
-----fold:3-----
Accuracy score:0.5
MAPE:0.03361140270518439
-----fold:4-----
Accuracy score:0.4669260700389105
MAPE:0.06424289935136082
-----fold:5-----
Accuracy score:0.4280155642023346
MAPE:0.18188580981252994
-----KOSDAQ-----
-----fold:1-----
Accuracy score:0.562624254473161
MAPE:0.1069223139319798
-----fold:2-----
Accuracy score:0.4294234592445328
MAPE:0.04788522500238554
-----fold:3-----
Accuracy score:0.5268389662027833
MAPE:0.06444811837902611
-----fold:4-----
Accuracy score:0.5347912524850894
MAPE:0.13383759945482335
-----fold:5-----
Accuracy score:0.40357852882703776
MAPE:0.10851111231981767
-----NASDAQ-----
-----fold:1-----
Accuracy score:0.5359223300970873
MAPE:0.2484118556806669
-----fold:2-----
Accuracy score:0.5281553398058253
MAPE:0.08128990272209487
-----fold:3-----
Accuracy score:0.4688715953307393
MAPE:0.04871689582711891
-----fold:4-----
Accuracy score:0.44163424124513617
MAPE:0.04585536204231135

```
-----fold:5-----
Accuracy score:0.4066147859922179
MAPE:0.2826715250946449
-----US30-----
-----fold:1-----
Accuracy score:0.4679611650485437
MAPE:0.16405584677848273
-----fold:2-----
Accuracy score:0.5203883495145631
MAPE:0.03533055185330528
-----fold:3-----
Accuracy score:0.4961089494163424
MAPE:0.04361160607794706
-----fold:4-----
Accuracy score:0.45136186770428016
MAPE:0.05255734096741962
-----fold:5-----
Accuracy score:0.4357976653696498
MAPE:0.14140272821701874
End Training
```

Compare to real_Indices

In [39]:

```
for i in range(len(stock_code)):
    start_date = '2021-11-01'
    end_date = '2021-11-26'
    stock_name[i] = fdr.DataReader(stock_code[i],start=start_date,end=end_date)[['Close']]
```

In [40]:

```
real_KOSPI200 = stock_name[0]
real_SNP500 = stock_name[1]
real_NASDAQ = stock_name[2]
real_KOSDAQ = stock_name[3]
real_US30 = stock_name[4]
```

In [41]:

```
def make_datetime(pred):
    pred_start = pd.to_datetime('2021-11-01')
    pred_end = pd.to_datetime('2021-11-26')
    name_pred = pd.DataFrame()
    name_pred.index = pd.date_range(pred_start,pred_end,freq='B')
    name_pred['pred'] = pred
    return name_pred
```

In [42]:

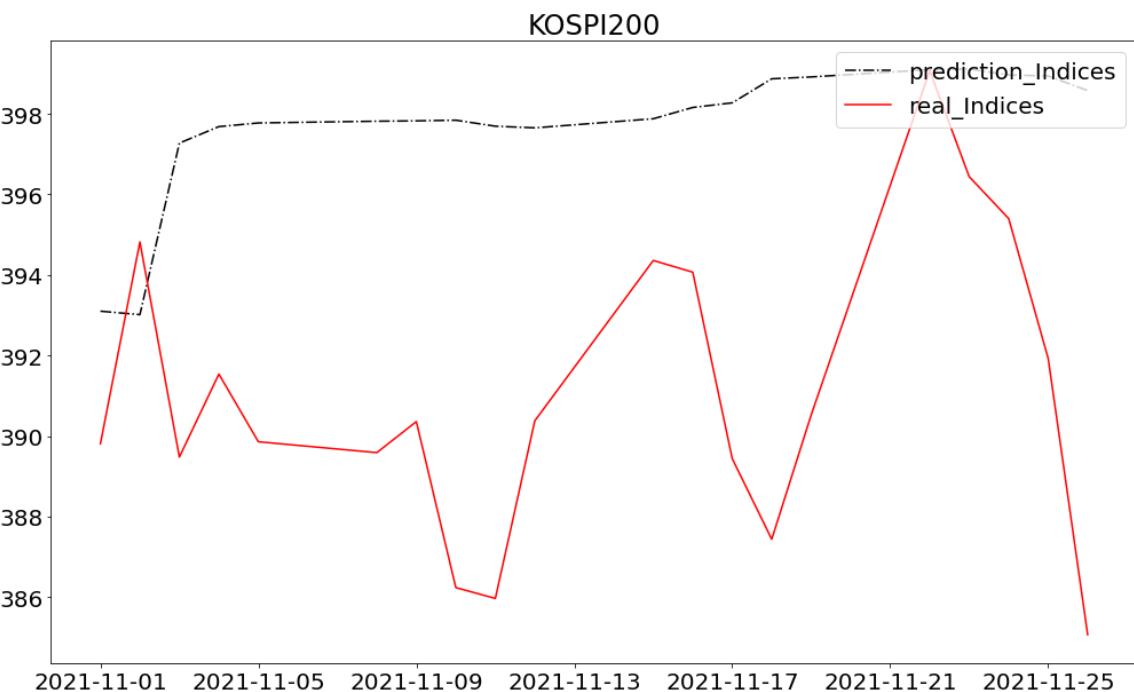
```
ML_KOSPI200_pred = make_datetime(rf_KOSPI200_pred)
ML_SNP500_pred = make_datetime(rf_SNP500_pred)
ML_KOSDAQ_pred = make_datetime(rf_KOSDAQ_pred)
ML_NASDAQ_pred = make_datetime(rf_NASDAQ_pred)
ML_US30_pred = make_datetime(rf_US30_pred)
```

In [43]:

```
def plot_result(label,pred,real):  
    plt.figure(figsize=(17,10))  
    plt.rc('font',size=20)  
    plt.title(label)  
    plt.plot(pred,ls='-.',label='prediction_Indices',color='black')  
    plt.plot(real,label='real_Indices',color='red')  
    plt.legend(loc='upper right')  
    plt.show()
```

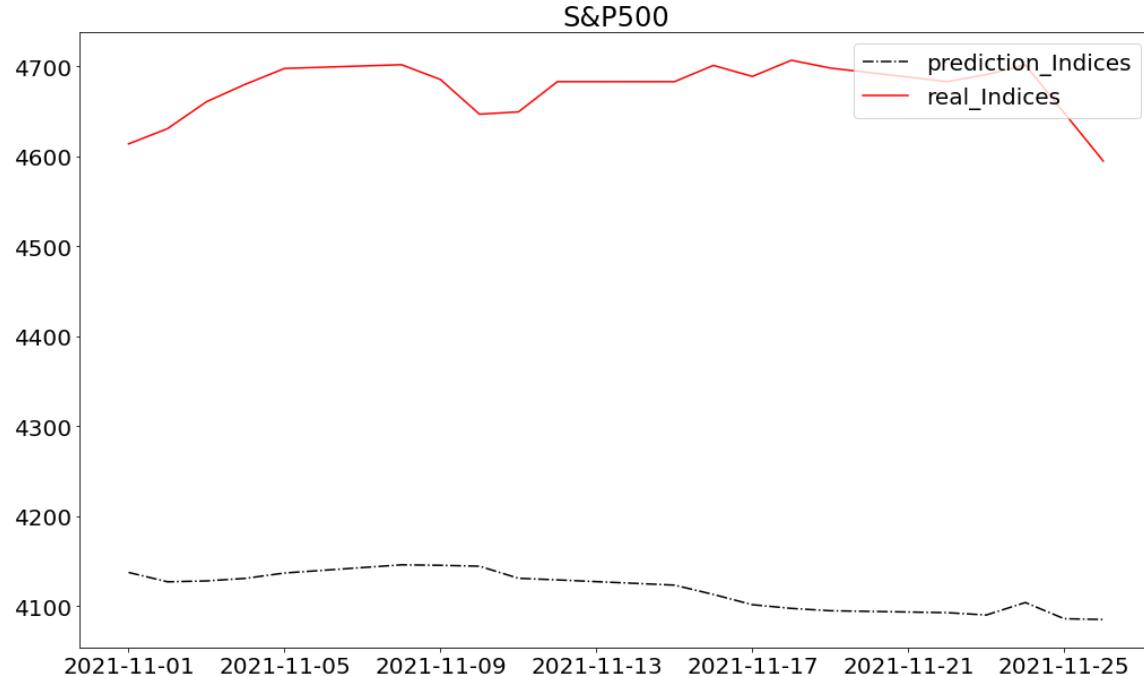
In [44]:

```
plot_result('KOSPI200',ML_KOSPI200_pred,real_KOSPI200)
```



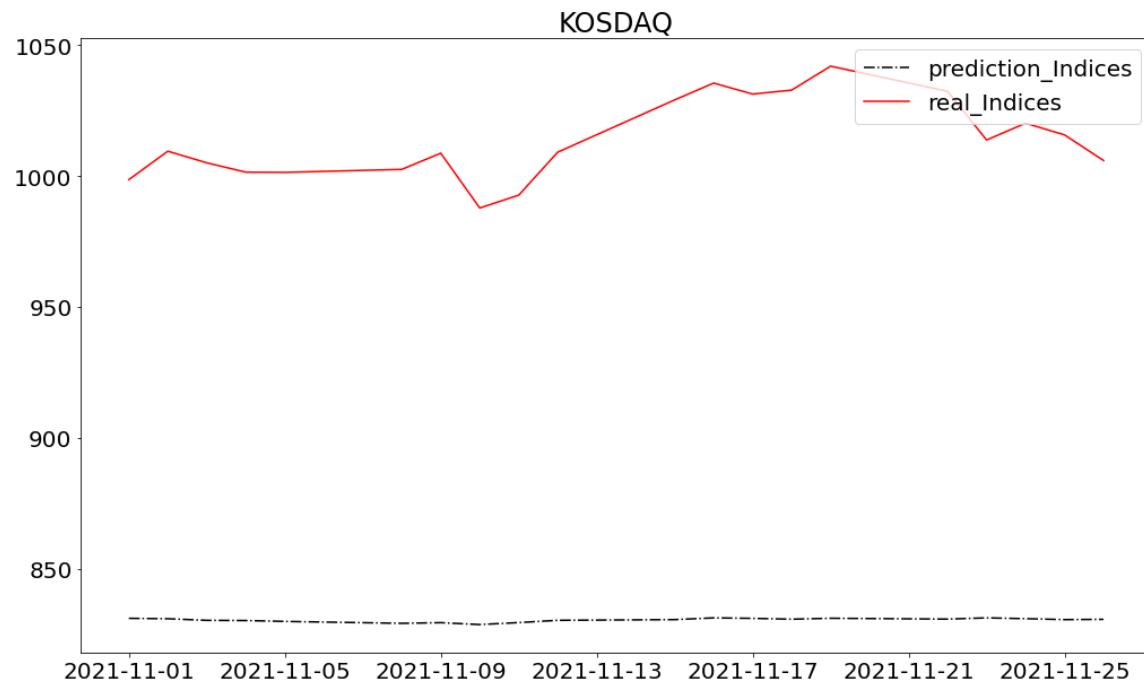
In [45]:

```
plot_result('S&P500',ML_SNP500_pred,real_SNP500)
```



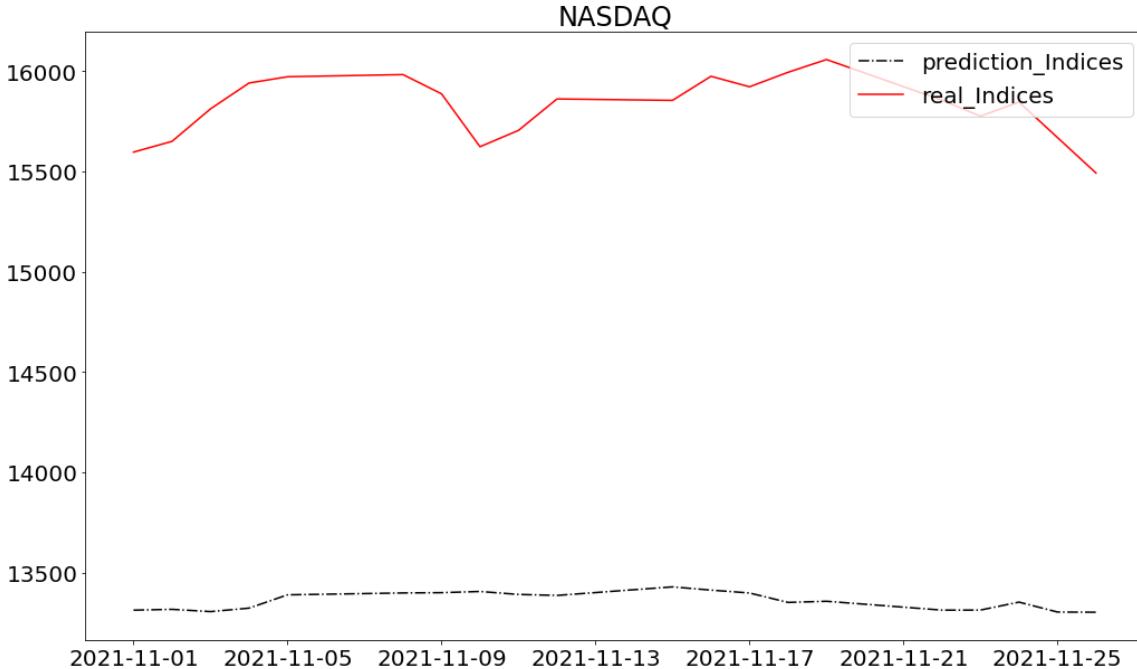
In [46]:

```
plot_result('KOSDAQ',ML_KOSDAQ_pred,real_KOSDAQ)
```



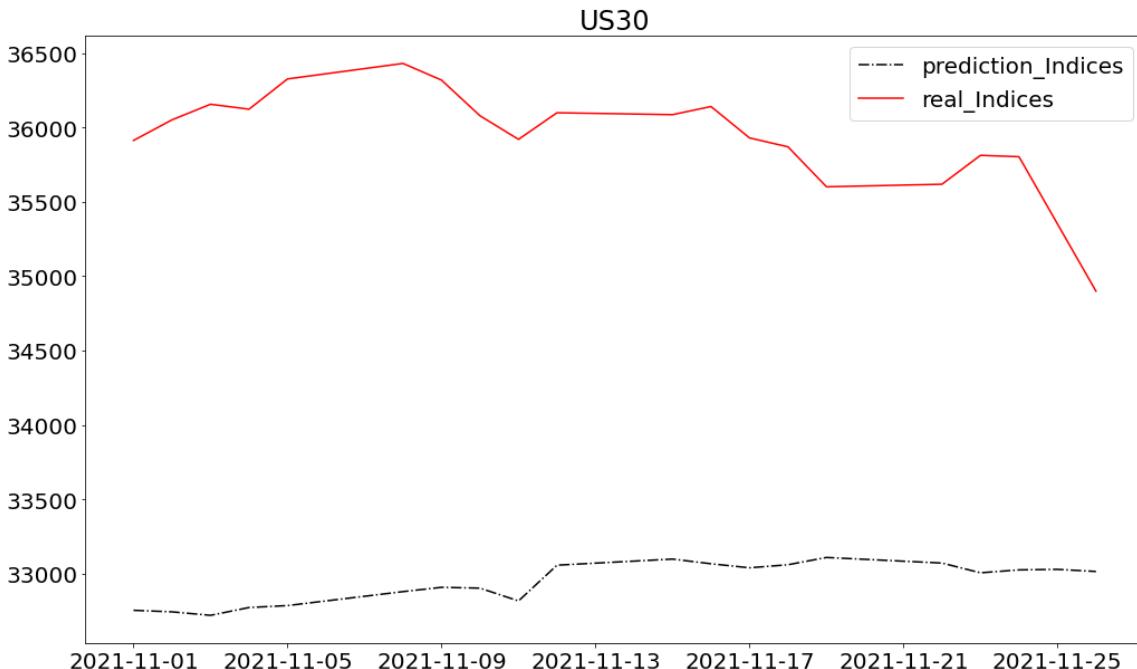
In [47]:

```
plot_result('NASDAQ',ML_NASDAQ_pred,real_NASDAQ)
```



In [48]:

```
plot_result('US30',ML_US30_pred,real_US30)
```



Deep Learning Dataset

Dataset Composition method

- 데이터를 주단위(5일)로 나누어서 5일간의 변동성을 모델로 훈련시켜서 데이터셋 다음날의 가격을 예측하게 하였습니다.
- 월-금의 데이터 다음주 월요일 예측, 화요일-다음주월요일 -> 다음주 화요일 예측
- 그래서 5개의 차원을 만들어서 한주의 column들을 model이 학습할 수 있도록 구성
- Convolution 과 GRU를 이용하기에 feature engineering을 통해서 만든 column들은 drop 하였습니다.

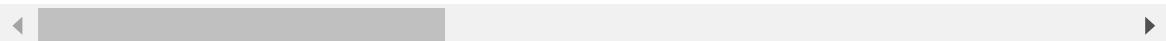
In [49]:

KOSPI200

Out [49]:

Date	Close	Open	High	Low	MA5	MA10	MA20	MA60	MA120
2011-06-28	270.41	274.37	275.59	270.41	271.242	269.888	272.9180	279.301667	273.936917
2011-06-29	274.61	275.33	275.47	273.06	272.022	269.896	272.5105	279.199667	273.943583
2011-06-30	275.17	275.82	276.08	274.02	273.188	270.525	272.1315	279.119000	273.938500
2011-07-01	278.77	277.90	279.69	277.34	274.080	271.780	272.1320	279.064667	273.967000
2011-07-04	281.67	281.28	282.85	281.13	276.126	273.508	272.2735	279.070000	274.024917
...
2021-10-25	395.01	392.45	395.99	390.02	394.136	391.027	393.9480	410.067833	420.208583
2021-10-26	399.07	397.75	399.67	396.28	394.868	392.865	393.4095	409.594500	419.981833
2021-10-27	395.48	398.31	398.82	394.41	395.216	394.003	392.6350	409.048833	419.757833
2021-10-28	393.89	394.87	397.79	393.89	395.358	394.433	392.0195	408.461167	419.537250
2021-10-29	388.47	396.08	396.92	387.82	394.384	393.961	391.4385	407.777500	419.244750

2549 rows × 21 columns



In [64]:

```
def deeplr_data(data):
    data.drop(['VMA5','VMA10','VMA20','VMA60','VMA120','Close_MA5','Close_MA10',
              'Close_MA20','Close_MA60','Close_MA120'],axis=1,inplace=True)
    name_train, name_test = data[:-25], data[-25:]
    name_train.reset_index(drop=True,inplace=True)
    name_target = name_train.Close.iloc[25:]
    name_train = name_train.iloc[0:-25]
    name_test.reset_index(drop=True,inplace=True)
    return name_train ,name_target , name_test
```

In [65]:

```
KOSPI200_train, KOSPI200_test, KOSPI200_target, = deeplr_data(KOSPI200)
SNP500_train,SNP500_test,SNP500_target = deeplr_data(SNP500)
NASDAQ_train,NASDAQ_test,NASDAQ_target = deeplr_data(NASDAQ)
KOSDAQ_train, KOSDAQ_test, KOSDAQ_target = deeplr_data(KOSDAQ)
US30_train, US30_test, US30_target = deeplr_data(US30)
```

In [67]:

```
print(KOSPI200_train.shape, KOSPI200_test.shape,KOSPI200_target.shape,)
```

```
(2499, 11) (2499,) (25, 11)
```

In [68]:

```
KOSPI200_train
```

Out [68]:

	Close	Open	High	Low	MA5	MA10	MA20	MA60	MA120	2
0	270.41	274.37	275.59	270.41	271.242	269.888	272.9180	279.301667	273.936917	28
1	274.61	275.33	275.47	273.06	272.022	269.896	272.5105	279.199667	273.943583	28
2	275.17	275.82	276.08	274.02	273.188	270.525	272.1315	279.119000	273.938500	27
3	278.77	277.90	279.69	277.34	274.080	271.780	272.1320	279.064667	273.967000	27
4	281.67	281.28	282.85	281.13	276.126	273.508	272.2735	279.070000	274.024917	28
...
2494	433.29	434.85	436.61	432.27	432.170	429.909	430.8800	431.165833	425.765083	43
2495	431.65	431.57	433.16	430.05	433.142	430.327	430.8985	431.357167	425.827167	43
2496	428.56	433.01	433.11	427.28	432.858	430.361	430.5910	431.528667	425.919833	43
2497	424.74	427.16	428.88	424.30	430.596	429.920	430.1495	431.556167	425.951500	43
2498	422.38	423.17	425.53	421.42	428.124	429.209	429.4305	431.567833	425.997333	43

2499 rows × 11 columns

In [55]:

```
def make_dataset(data, label, window_size=5):
    feature_list = []
    label_list = []
    for i in range(len(data) - window_size):
        feature_list.append(np.array(data.iloc[i:i+window_size]))
        label_list.append(np.array(label.iloc[i+window_size]))
    return np.array(feature_list), np.array(label_list)
```

In [56]:

```
def make_testset(data , window_size=5):
    feature_list = []
    for i in range(len(data) - window_size):
        feature_list.append(np.array(data.iloc[i:i+window_size]))
    return np.array(feature_list)
```

In [57]:

```
feature = [KOSPI200.keys()]
label = ['Close']
KOSPI200_trainset , KOSPI200_target = make_dataset(KOSPI200_train,KOSPI200_target)
KOSPI200_testset = make_testset(KOSPI200_test)

SNP500_trainset, SNP500_target = make_dataset(SNP500_train,SNP500_target)
SNP500_testset = make_testset(SNP500_test)

KOSDAQ_trainset, KOSDAQ_target = make_dataset(KOSDAQ_train,KOSDAQ_target)
KOSDAQ_testset = make_testset(KOSDAQ_test)

NASDAQ_trainset, NASDAQ_target = make_dataset(NASDAQ_train,NASDAQ_target)
NASDAQ_testset = make_testset(NASDAQ_test)

US30_trainset, US30_target = make_dataset(US30_train,US30_target)
US30_testset = make_testset(US30_test)
```

In [58]:

```
print(KOSDAQ_trainset.shape,KOSDAQ_target.shape)
print(KOSDAQ_testset.shape)
```

```
(2495, 5, 11) (2495,)
(20, 5, 11)
```

dataset to tensor

In [59]:

```
class CustomDataset(Dataset):
    def __init__(self,data,label):
        self.data = data
        self.label = label
    def __len__(self):
        return len(self.data)

    def __getitem__(self, idx):
        data = torch.tensor(self.data[idx],dtype=torch.float64)
        label = torch.tensor(self.label[idx],dtype=torch.int64)
        return data,label
```

In [60]:

```
class CustomTestset(Dataset):
    def __init__(self,data):
        self.data = data
    def __len__(self):
        return len(self.data)

    def __getitem__(self, idx):
        data = torch.tensor(self.data[idx],dtype=torch.float64)
        return data
```

CNN2RNN Dataset

In [61]:

```
KOSPI200_train_set = CustomDataset(KOSPI200_trainset,KOSPI200_target)
KOSPI200_test_set = CustomTestset(KOSPI200_testset)

SNP500_train_set = CustomDataset(SNP500_trainset,SNP500_target)
SNP500_test_set = CustomTestset(SNP500_testset)

KOSDAQ_train_set = CustomDataset(KOSDAQ_trainset,KOSDAQ_target)
KOSDAQ_test_set = CustomTestset(KOSDAQ_testset)

NASDAQ_train_set = CustomDataset(NASDAQ_trainset,NASDAQ_target)
NASDAQ_test_set = CustomTestset(NASDAQ_testset)

US30_train_set = CustomDataset(US30_trainset,US30_target)
US30_test_set = CustomTestset(US30_testset)
```

Deep Learning Model

In [62]:

```
import torch
import torch.nn as nn
from torch.utils.data.sampler import SubsetRandomSampler
import tensorflow
from tensorflow.keras.layers import LSTM,Dense,Dropout,Flatten,GRU,LeakyReLU,Conv2D,MaxPool1D
from tensorflow.keras.models import Sequential
from sklearn.model_selection import KFold
from pytorch_lightning.callbacks.early_stopping import EarlyStopping
from pytorch_lightning import Trainer
```

Model

- activation : HardSwish,GELU,LeakyReLU
- layers : Conv1d,GRU,Linear,BatchNormalization

모델 설명

- Convolution 1d 를 사용하여서 kernel size는 1로 하고 activation fuction을 통해서 feature size의 변화없이 채널 사이즈의 변화와 비선형성을 주었습니다.
- GRU를 통하여서 convolution을 통한 weight가 아닌 다시 input을 삽입하여서 overfitting을 최소화 하였습니다. 아무래도 주식가격예측문제와 같은 time-series data에서 overfitting은 피할 수 없는 문제인것 같습니다.
- 그리고 두 layer들을 통하여 나온 weight와 bias를 결합하여서 Linear를 통해서 가격을 예측해보았습니다.

In [72]:

```
Image('..../input/image-finance/20220225_144122.png')
```

Out [72]:

[37]	Chinese Stocks	2007-2017	OCHLV	CNN + LSTM	Annualized Return, Mxm Retracement	Python
------	----------------	-----------	-------	------------	------------------------------------	--------

In [73]:

```
class CNN2GRU(nn.Module):
    def __init__(self):
        super(CNN2GRU, self).__init__()
        self.conv1 = nn.Conv1d(5, 128, 1)
        self.bn1 = nn.BatchNorm1d(128)
        self.conv2 = nn.Conv1d(128, 256, 1)
        self.bn2 = nn.BatchNorm1d(256)
        self.conv3 = nn.Conv1d(256, 512, 1)
        self.bn3 = nn.BatchNorm1d(512)
        self.gru1 = nn.LSTM(11, 512, 4)
        self.gru2 = nn.LSTM(512, 256, 4)
        self.gru3 = nn.LSTM(256, 11, 4)
        self.fc1 = nn.Linear(5687, 1024)
        self.fc2 = nn.Linear(1024, 1024)
        self.fc3 = nn.Linear(1024, 256)
        self.fc4 = nn.Linear(256, 1)
        self.flatten = nn.Flatten()
        self.gelu = nn.GELU()
        self.lrelu = nn.LeakyReLU(0.1)
        self.dropout = nn.Dropout(0.25)
        self.swish = nn.Hardswish()
    def forward(self, input):
        x = self.bn1(self.swish(self.conv1(input)))
        x = self.bn2(self.swish(self.conv2(x)))
        conv_out = self.bn3(self.swish(self.conv3(x)))
        x,_ = self.gru1(input)
        x = self.gelu(x)
        x,_ = self.gru2(x)
        x = self.gelu(x)
        x,_ = self.gru3(x)
        GRU_out = self.gelu(x)
        x = torch.cat([conv_out,GRU_out],dim=1)
        x = x.flatten(1)
        x = self.dropout(self.swish(self.fc1(x)))
        x = self.dropout(self.swish(self.fc2(x)))
        x = self.dropout(self.swish(self.fc3(x)))
        output = self.fc4(x)
        output = output.view(-1)
        return output
model = CNN2GRU()
model
```

Out [73]:

```
CNN2GRU(  
    (conv1): Conv1d(5, 128, kernel_size=(1,), stride=(1,))  
    (bnn1): BatchNorm1d(128, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)  
    (conv2): Conv1d(128, 256, kernel_size=(1,), stride=(1,))  
    (bnn2): BatchNorm1d(256, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)  
    (conv3): Conv1d(256, 512, kernel_size=(1,), stride=(1,))  
    (bnn3): BatchNorm1d(512, eps=1e-05, momentum=0.1, affine=True, track_running_stats=True)  
    (gru1): LSTM(11, 512, num_layers=4)  
    (gru2): LSTM(512, 256, num_layers=4)  
    (gru3): LSTM(256, 11, num_layers=4)  
    (fc1): Linear(in_features=5687, out_features=1024, bias=True)  
    (fc2): Linear(in_features=1024, out_features=1024, bias=True)  
    (fc3): Linear(in_features=1024, out_features=256, bias=True)  
    (fc4): Linear(in_features=256, out_features=1, bias=True)  
    (flatten): Flatten(start_dim=1, end_dim=-1)  
    (gelu): GELU()  
    (lrelu): LeakyReLU(negative_slope=0.1)  
    (dropout): Dropout(p=0.25, inplace=False)  
    (swish): Hardswish()  
)
```

Train Session

- optimizer : AdamMax
- Loss_func : MAPE_Loss , NMAE
- 어떠한 Loss가 모델의 Weight에 좋은 영향을 끼치는지 실험적으로 판단해보았습니다.
- validation Loss , accuracy를 중심으로 더 좋아지는 방향으로 모델을 저장했습니다.

In [74]:

```
def MAPELoss(output,target):  
    return torch.mean(torch.abs((target - output)/ target))  
  
def NMAELoss(pred,target):  
    return abs(target - pred).sum() / (abs(target).sum()) * 100
```

In [75]:

```
def train(model,loader,device,optimizer):
    model.train()
    train_loss = []
    train_acc = []
    tqdm_train = tqdm(loader)
    for data,label in tqdm_train:
        data,label = data.to(device).float(),label.to(device)
        optimizer.zero_grad()
        logits = model(data)
        label = label.to(torch.float32)
        target_binary, pred_binary = indices_binarizer(label,logits)
        acc = accuracy_score(target_binary,pred_binary)
        loss = MAPELoss(logits,label)
        loss.backward()
        optimizer.step()

        loss_np = loss.detach().cpu().numpy()
        acc_np = acc
        train_loss.append(loss_np)
        train_acc.append(acc_np)
    train_loss = np.mean(train_loss)
    train_acc = np.mean(train_acc)

    return train_acc, train_loss
```

In [76]:

```
def validation(model,loader,device):
    model.eval()
    valid_acc = []
    valid_loss = []
    tqdm_valid = tqdm(loader)
    with torch.no_grad():
        for data,label in tqdm_valid:

            data,label = data.to(device).float(),label.to(device)

            logits = model(data)
            loss = MAPELoss(logits,label)
            target_binary, pred_binary = indices_binarizer(label,logits)
            acc = accuracy_score(target_binary,pred_binary)
            loss_np = loss.detach().cpu().numpy()
            acc_np = acc
            valid_loss.append(loss_np)
            valid_acc.append(acc_np)
    valid_loss = np.mean(valid_loss)
    valid_acc = np.mean(valid_acc)
    return valid_acc, valid_loss
```

In [79]:

```
def CNN2RNN_run(stock_name,model,data,lr,epochs):
    device = ('cuda' if torch.cuda.is_available() else 'cpu')
    kf = KFold(n_splits=5,shuffle=True)
    for fold,(train_idx,valid_idx) in enumerate(kf.split(data)):
        print(f'Fold:{fold+1}')
        train_sampler_kfold = SubsetRandomSampler(train_idx)
        valid_sampler_kfold = SubsetRandomSampler(valid_idx)
        train_loader = torch.utils.data.DataLoader(data,batch_size=128,
                                                    num_workers=0,sampler=train_sampler_kfold,drop_
p_last=True)
        valid_loader = torch.utils.data.DataLoader(data,batch_size=128,
                                                    num_workers=0,sampler=valid_sampler_kfold,drop_las_
t=True)
        valid_min_loss = np.inf
        name_train_acc = []
        name_valid_acc = []
        name_train_loss = []
        name_valid_loss = []
        model = CNN2GRU()
        model.to(device)
        optimizer = torch.optim.Adamax(model.parameters(),lr=lr)
        for e in range(epochs):
            train_acc,train_loss = train(model,train_loader,device,optimizer)
            valid_acc,valid_loss = validation(model,valid_loader,device)

            name_train_loss.append(train_loss)
            name_valid_loss.append(valid_loss)
            name_train_acc.append(train_acc)
            name_valid_acc.append(valid_acc)

            print('Epochs:{}\t Training Accuracy:{:.3f}\t Validation Accuracy:{:.3f}'.format(
                e+1,train_acc,valid_acc))

            print('Epoch:{}\t Training Loss:{:.3f}\t Validation Loss:{:.3f}'.format(
                e+1,train_loss,valid_loss))
            if valid_loss < valid_min_loss:
                print('Validation Loss decreased:{:.3f} --> {:.3f} So saving the model'.format(
                    valid_min_loss,valid_loss))
                valid_min_loss = valid_loss
                torch.save(model,f'{stock_name}_CNN2GRU_{fold}.pt')
                patience = 0
            else:
                patience += 1
                print(f'count patience:{patience} of 10')
                if patience > 10:
                    print(f"Meet Early Stopper so End Training...\nAnd best Valid MAPE Loss:{val_
id_min_loss}")
                    break
    return name_train_acc, name_train_loss, name_valid_acc, name_valid_loss
```

In [80]:

```
print('-----KOSPI200-----')
KOSPI200_train_acc, KOSPI200_train_loss, KOSPI200_valid_acc, KOSPI200_valid_loss = CNN2RNN_run(
'KOSPI200',CNN2GRU(),KOSPI200_train_set,lr=0.0003,epochs=100)
print('-----S&P500-----')
SNP500_train_acc, SNP500_train_loss,SNP500_valid_acc ,SNP500_valid_loss = CNN2RNN_run( 'SNP500',C
NN2GRU(),SNP500_train_set,lr=0.0003,epochs=100)
print('-----KOSDAQ-----')
KOSDAQ_train_acc,KOSDAQ_train_loss,KOSDAQ_valid_acc ,KOSDAQ_valid_loss = CNN2RNN_run( 'KOSDAQ',CN
N2GRU(),KOSDAQ_train_set,lr=0.0003,epochs=100)
print('-----NASDAQ-----')
NASDAQ_train_acc,NASDAQ_train_loss,NASDAQ_valid_acc,NASDAQ_valid_loss = CNN2RNN_run( 'NASDAQ',CN
N2GRU(),NASDAQ_train_set,lr=0.0003,epochs=100)
print('-----US30-----')
US30_train_acc,US30_train_loss,US30_valid_acc,US30_valid_loss = CNN2RNN_run( 'US30',CNN2GRU(),US3
0_train_set,lr=0.0003,epochs=100)
```

-----K0SP|200-----

Fold:1

100% |██████████| 15/15 [00:01<00:00, 10.81it/s]
100% |██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:1 Training Accuracy:0.491 Validation Accuracy:0.504

Epoch:1 Training Loss:0.960 Validation Loss:0.952841

Validation Loss decreased:inf --> 0.952841 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.90it/s]
100% |██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:2 Training Accuracy:0.475 Validation Accuracy:0.612

Epoch:2 Training Loss:0.582 Validation Loss:0.562929

Validation Loss decreased:0.952841 --> 0.562929 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.54it/s]
100% |██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:3 Training Accuracy:0.586 Validation Accuracy:0.540

Epoch:3 Training Loss:0.363 Validation Loss:0.334505

Validation Loss decreased:0.562929 --> 0.334505 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.92it/s]
100% |██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:4 Training Accuracy:0.536 Validation Accuracy:0.610

Epoch:4 Training Loss:0.256 Validation Loss:0.198768

Validation Loss decreased:0.334505 --> 0.198768 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.62it/s]
100% |██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:5 Training Accuracy:0.590 Validation Accuracy:0.579

Epoch:5 Training Loss:0.157 Validation Loss:0.113351

Validation Loss decreased:0.198768 --> 0.113351 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.57it/s]
100% |██████████| 3/3 [00:00<00:00, 19.41it/s]

Epochs:6 Training Accuracy:0.593 Validation Accuracy:0.625

Epoch:6 Training Loss:0.109 Validation Loss:0.066272

Validation Loss decreased:0.113351 --> 0.066272 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.52it/s]
100% |██████████| 3/3 [00:00<00:00, 21.45it/s]

Epochs:7 Training Accuracy:0.590 Validation Accuracy:0.597

Epoch:7 Training Loss:0.087 Validation Loss:0.056146

Validation Loss decreased:0.066272 --> 0.056146 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.75it/s]
100% |██████████| 3/3 [00:00<00:00, 21.22it/s]

Epochs:8 Training Accuracy:0.633 Validation Accuracy:0.615

Epoch:8 Training Loss:0.088 Validation Loss:0.054536

Validation Loss decreased:0.056146 --> 0.054536 So saving the model

100% |██████████| 15/15 [00:01<00:00, 10.37it/s]
100% |██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:9 Training Accuracy:0.641 Validation Accuracy:0.594

Epoch:9 Training Loss:0.086 Validation Loss:0.056336

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:10 Training Accuracy:0.612 Validation Accuracy:0.592

Epoch:10 Training Loss:0.089 Validation Loss:0.064779

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]

100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:11 Training Accuracy:0.607 Validation Accuracy:0.643

Epoch:11 Training Loss:0.085 Validation Loss:0.065291

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.37it/s]

Epochs:12 Training Accuracy:0.629 Validation Accuracy:0.651

Epoch:12 Training Loss:0.084 Validation Loss:0.071500

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:13 Training Accuracy:0.582 Validation Accuracy:0.638

Epoch:13 Training Loss:0.089 Validation Loss:0.046603

Validation Loss decreased:0.054536 --> 0.046603 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:14 Training Accuracy:0.613 Validation Accuracy:0.602

Epoch:14 Training Loss:0.089 Validation Loss:0.056915

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:15 Training Accuracy:0.634 Validation Accuracy:0.677

Epoch:15 Training Loss:0.087 Validation Loss:0.060510

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]

100%|██████████| 3/3 [00:00<00:00, 21.27it/s]

Epochs:16 Training Accuracy:0.589 Validation Accuracy:0.576

Epoch:16 Training Loss:0.080 Validation Loss:0.040271

Validation Loss decreased:0.046603 --> 0.040271 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:17 Training Accuracy:0.609 Validation Accuracy:0.610

Epoch:17 Training Loss:0.079 Validation Loss:0.043035

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:18 Training Accuracy:0.595 Validation Accuracy:0.589
Epoch:18 Training Loss:0.077 Validation Loss:0.055700
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:19 Training Accuracy:0.626 Validation Accuracy:0.669
Epoch:19 Training Loss:0.080 Validation Loss:0.047911
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.25it/s]

Epochs:20 Training Accuracy:0.619 Validation Accuracy:0.664
Epoch:20 Training Loss:0.080 Validation Loss:0.041837
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:21 Training Accuracy:0.611 Validation Accuracy:0.680
Epoch:21 Training Loss:0.079 Validation Loss:0.046101
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:22 Training Accuracy:0.602 Validation Accuracy:0.532
Epoch:22 Training Loss:0.087 Validation Loss:0.059927
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.38it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:23 Training Accuracy:0.609 Validation Accuracy:0.695
Epoch:23 Training Loss:0.085 Validation Loss:0.047559
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:24 Training Accuracy:0.613 Validation Accuracy:0.690
Epoch:24 Training Loss:0.085 Validation Loss:0.058066
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:25 Training Accuracy:0.597 Validation Accuracy:0.599
Epoch:25 Training Loss:0.082 Validation Loss:0.045065
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.44it/s]
100%|██████████| 3/3 [00:00<00:00, 19.05it/s]

Epochs:26 Training Accuracy:0.584 Validation Accuracy:0.630
Epoch:26 Training Loss:0.074 Validation Loss:0.045058
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.55it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:27 Training Accuracy:0.626 Validation Accuracy:0.633
Epoch:27 Training Loss:0.085 Validation Loss:0.074794
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.040271371603012085
Fold:2

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:1 Training Accuracy:0.490 Validation Accuracy:0.494
Epoch:1 Training Loss:0.957 Validation Loss:0.936911
Validation Loss decreased:inf --> 0.936911 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:2 Training Accuracy:0.495 Validation Accuracy:0.592
Epoch:2 Training Loss:0.561 Validation Loss:0.467128
Validation Loss decreased:0.936911 --> 0.467128 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:3 Training Accuracy:0.561 Validation Accuracy:0.581
Epoch:3 Training Loss:0.379 Validation Loss:0.314373
Validation Loss decreased:0.467128 --> 0.314373 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.32it/s]

Epochs:4 Training Accuracy:0.536 Validation Accuracy:0.641
Epoch:4 Training Loss:0.268 Validation Loss:0.189060
Validation Loss decreased:0.314373 --> 0.189060 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:5 Training Accuracy:0.546 Validation Accuracy:0.599
Epoch:5 Training Loss:0.184 Validation Loss:0.133388
Validation Loss decreased:0.189060 --> 0.133388 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:6 Training Accuracy:0.594 Validation Accuracy:0.576
Epoch:6 Training Loss:0.125 Validation Loss:0.092051
Validation Loss decreased:0.133388 --> 0.092051 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:7 Training Accuracy:0.599 Validation Accuracy:0.636
Epoch:7 Training Loss:0.090 Validation Loss:0.052967
Validation Loss decreased:0.092051 --> 0.052967 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.22it/s]

Epochs:8 Training Accuracy:0.587 Validation Accuracy:0.643
Epoch:8 Training Loss:0.091 Validation Loss:0.054828
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.27it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:9 Training Accuracy:0.589 Validation Accuracy:0.661
Epoch:9 Training Loss:0.082 Validation Loss:0.049861
Validation Loss decreased:0.052967 --> 0.049861 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:10 Training Accuracy:0.634 Validation Accuracy:0.669
Epoch:10 Training Loss:0.083 Validation Loss:0.058263
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:11 Training Accuracy:0.616 Validation Accuracy:0.633
Epoch:11 Training Loss:0.086 Validation Loss:0.056491
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.26it/s]

Epochs:12 Training Accuracy:0.609 Validation Accuracy:0.501
Epoch:12 Training Loss:0.084 Validation Loss:0.063062
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:13 Training Accuracy:0.605 Validation Accuracy:0.553
Epoch:13 Training Loss:0.082 Validation Loss:0.049944
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.09it/s]

Epochs:14 Training Accuracy:0.612 Validation Accuracy:0.705
Epoch:14 Training Loss:0.093 Validation Loss:0.056571
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:15 Training Accuracy:0.625 Validation Accuracy:0.543
Epoch:15 Training Loss:0.088 Validation Loss:0.050809
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:16 Training Accuracy:0.571 Validation Accuracy:0.638
Epoch:16 Training Loss:0.084 Validation Loss:0.048147
Validation Loss decreased:0.049861 --> 0.048147 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:17 Training Accuracy:0.620 Validation Accuracy:0.605
Epoch:17 Training Loss:0.079 Validation Loss:0.053562
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 17.70it/s]

Epochs:18 Training Accuracy:0.612 Validation Accuracy:0.731
Epoch:18 Training Loss:0.084 Validation Loss:0.053802
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.03it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:19 Training Accuracy:0.622 Validation Accuracy:0.610
Epoch:19 Training Loss:0.079 Validation Loss:0.044628
Validation Loss decreased:0.048147 --> 0.044628 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.89it/s]

Epochs:20 Training Accuracy:0.637 Validation Accuracy:0.587
Epoch:20 Training Loss:0.077 Validation Loss:0.057675
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:21 Training Accuracy:0.587 Validation Accuracy:0.597
Epoch:21 Training Loss:0.080 Validation Loss:0.048405
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:22 Training Accuracy:0.619 Validation Accuracy:0.680
Epoch:22 Training Loss:0.076 Validation Loss:0.040904
Validation Loss decreased:0.044628 --> 0.040904 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:23 Training Accuracy:0.614 Validation Accuracy:0.636
Epoch:23 Training Loss:0.076 Validation Loss:0.048230
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:24 Training Accuracy:0.604 Validation Accuracy:0.610
Epoch:24 Training Loss:0.084 Validation Loss:0.045867
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:25 Training Accuracy:0.631 Validation Accuracy:0.649
Epoch:25 Training Loss:0.075 Validation Loss:0.043990
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:26 Training Accuracy:0.617 Validation Accuracy:0.587
Epoch:26 Training Loss:0.078 Validation Loss:0.054073
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:27 Training Accuracy:0.591 Validation Accuracy:0.605
Epoch:27 Training Loss:0.083 Validation Loss:0.055316
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:28 Training Accuracy:0.604 Validation Accuracy:0.659
Epoch:28 Training Loss:0.077 Validation Loss:0.041492
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:29 Training Accuracy:0.604 Validation Accuracy:0.659
Epoch:29 Training Loss:0.074 Validation Loss:0.043893
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.29it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:30 Training Accuracy:0.611 Validation Accuracy:0.584
Epoch:30 Training Loss:0.074 Validation Loss:0.040462
Validation Loss decreased:0.040904 --> 0.040462 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:31 Training Accuracy:0.625 Validation Accuracy:0.587
Epoch:31 Training Loss:0.078 Validation Loss:0.052004
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:32 Training Accuracy:0.604 Validation Accuracy:0.602
Epoch:32 Training Loss:0.080 Validation Loss:0.045808
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:33 Training Accuracy:0.638 Validation Accuracy:0.615
Epoch:33 Training Loss:0.072 Validation Loss:0.042853
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 20.85it/s]

Epochs:34 Training Accuracy:0.609 Validation Accuracy:0.724
Epoch:34 Training Loss:0.077 Validation Loss:0.055182
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:35 Training Accuracy:0.623 Validation Accuracy:0.566
Epoch:35 Training Loss:0.076 Validation Loss:0.047604
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:36 Training Accuracy:0.602 Validation Accuracy:0.641
Epoch:36 Training Loss:0.071 Validation Loss:0.050825
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 21.22it/s]

Epochs:37 Training Accuracy:0.584 Validation Accuracy:0.623
Epoch:37 Training Loss:0.074 Validation Loss:0.044684
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 19.25it/s]

Epochs:38 Training Accuracy:0.629 Validation Accuracy:0.659
Epoch:38 Training Loss:0.073 Validation Loss:0.058622
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.07it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:39 Training Accuracy:0.623 Validation Accuracy:0.687
Epoch:39 Training Loss:0.074 Validation Loss:0.054531
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:40 Training Accuracy:0.620 Validation Accuracy:0.558
Epoch:40 Training Loss:0.080 Validation Loss:0.044854
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:41 Training Accuracy:0.586 Validation Accuracy:0.587
Epoch:41 Training Loss:0.070 Validation Loss:0.038767
Validation Loss decreased:0.040462 --> 0.038767 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:42 Training Accuracy:0.602 Validation Accuracy:0.543
Epoch:42 Training Loss:0.074 Validation Loss:0.043445
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 18.71it/s]

Epochs:43 Training Accuracy:0.610 Validation Accuracy:0.677
Epoch:43 Training Loss:0.072 Validation Loss:0.046007
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:44 Training Accuracy:0.626 Validation Accuracy:0.602
Epoch:44 Training Loss:0.072 Validation Loss:0.039499
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:45 Training Accuracy:0.611 Validation Accuracy:0.695
Epoch:45 Training Loss:0.076 Validation Loss:0.051940
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:46 Training Accuracy:0.611 Validation Accuracy:0.612
Epoch:46 Training Loss:0.073 Validation Loss:0.053608
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:47 Training Accuracy:0.625 Validation Accuracy:0.618
Epoch:47 Training Loss:0.079 Validation Loss:0.045080
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:48 Training Accuracy:0.609 Validation Accuracy:0.643
Epoch:48 Training Loss:0.073 Validation Loss:0.038683
Validation Loss decreased:0.038767 --> 0.038683 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:49 Training Accuracy:0.611 Validation Accuracy:0.630
Epoch:49 Training Loss:0.071 Validation Loss:0.042362
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 17.70it/s]

Epochs:50 Training Accuracy:0.644 Validation Accuracy:0.677
Epoch:50 Training Loss:0.070 Validation Loss:0.050818
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.43it/s]
100%|██████████| 3/3 [00:00<00:00, 21.19it/s]

Epochs:51 Training Accuracy:0.610 Validation Accuracy:0.677
Epoch:51 Training Loss:0.071 Validation Loss:0.044519
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:52 Training Accuracy:0.631 Validation Accuracy:0.610
Epoch:52 Training Loss:0.077 Validation Loss:0.049668
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.21it/s]

Epochs:53 Training Accuracy:0.605 Validation Accuracy:0.721
Epoch:53 Training Loss:0.075 Validation Loss:0.042427
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:54 Training Accuracy:0.636 Validation Accuracy:0.612
Epoch:54 Training Loss:0.072 Validation Loss:0.043457
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:55 Training Accuracy:0.618 Validation Accuracy:0.556
Epoch:55 Training Loss:0.075 Validation Loss:0.046420
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:56 Training Accuracy:0.610 Validation Accuracy:0.646
Epoch:56 Training Loss:0.070 Validation Loss:0.040483
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 20.06it/s]

Epochs:57 Training Accuracy:0.616 Validation Accuracy:0.615
Epoch:57 Training Loss:0.073 Validation Loss:0.042769
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.24it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:58 Training Accuracy:0.606 Validation Accuracy:0.643
Epoch:58 Training Loss:0.071 Validation Loss:0.042265
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 9.93it/s]
100%|██████████| 3/3 [00:00<00:00, 20.75it/s]

Epochs:59 Training Accuracy:0.609 Validation Accuracy:0.584
Epoch:59 Training Loss:0.070 Validation Loss:0.044528
count patience:11 of 10

Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.038683146238327026
Fold:3

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:1 Training Accuracy:0.487 Validation Accuracy:0.512
Epoch:1 Training Loss:0.959 Validation Loss:0.937708
Validation Loss decreased:inf --> 0.937708 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:2 Training Accuracy:0.482 Validation Accuracy:0.589
Epoch:2 Training Loss:0.570 Validation Loss:0.536952
Validation Loss decreased:0.937708 --> 0.536952 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:3 Training Accuracy:0.571 Validation Accuracy:0.553

Epoch:3 Training Loss:0.359 Validation Loss:0.320953

Validation Loss decreased:0.536952 --> 0.320953 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:4 Training Accuracy:0.561 Validation Accuracy:0.589

Epoch:4 Training Loss:0.249 Validation Loss:0.194354

Validation Loss decreased:0.320953 --> 0.194354 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]

100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:5 Training Accuracy:0.586 Validation Accuracy:0.592

Epoch:5 Training Loss:0.165 Validation Loss:0.140730

Validation Loss decreased:0.194354 --> 0.140730 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]

100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:6 Training Accuracy:0.605 Validation Accuracy:0.667

Epoch:6 Training Loss:0.114 Validation Loss:0.095961

Validation Loss decreased:0.140730 --> 0.095961 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]

100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:7 Training Accuracy:0.616 Validation Accuracy:0.589

Epoch:7 Training Loss:0.095 Validation Loss:0.061820

Validation Loss decreased:0.095961 --> 0.061820 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]

100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:8 Training Accuracy:0.599 Validation Accuracy:0.568

Epoch:8 Training Loss:0.091 Validation Loss:0.062101

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:9 Training Accuracy:0.611 Validation Accuracy:0.517

Epoch:9 Training Loss:0.089 Validation Loss:0.077371

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:10 Training Accuracy:0.596 Validation Accuracy:0.649

Epoch:10 Training Loss:0.085 Validation Loss:0.046363

Validation Loss decreased:0.061820 --> 0.046363 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]

100%|██████████| 3/3 [00:00<00:00, 20.24it/s]

Epochs:11 Training Accuracy:0.618 Validation Accuracy:0.602

Epoch:11 Training Loss:0.085 Validation Loss:0.052764

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.14it/s]

100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:12 Training Accuracy:0.620 Validation Accuracy:0.540
Epoch:12 Training Loss:0.081 Validation Loss:0.047785
count patience:2 of 10
100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:13 Training Accuracy:0.611 Validation Accuracy:0.610
Epoch:13 Training Loss:0.082 Validation Loss:0.046272
Validation Loss decreased:0.046363 --> 0.046272 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.17it/s]

Epochs:14 Training Accuracy:0.627 Validation Accuracy:0.685
Epoch:14 Training Loss:0.078 Validation Loss:0.060056
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:15 Training Accuracy:0.628 Validation Accuracy:0.669
Epoch:15 Training Loss:0.080 Validation Loss:0.071645
count patience:2 of 10
100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 20.95it/s]

Epochs:16 Training Accuracy:0.586 Validation Accuracy:0.674
Epoch:16 Training Loss:0.083 Validation Loss:0.053562
count patience:3 of 10
100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:17 Training Accuracy:0.608 Validation Accuracy:0.522
Epoch:17 Training Loss:0.079 Validation Loss:0.053957
count patience:4 of 10
100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 16.98it/s]

Epochs:18 Training Accuracy:0.592 Validation Accuracy:0.620
Epoch:18 Training Loss:0.083 Validation Loss:0.055102
count patience:5 of 10
100%|██████████| 15/15 [00:01<00:00, 9.80it/s]
100%|██████████| 3/3 [00:00<00:00, 17.48it/s]

Epochs:19 Training Accuracy:0.612 Validation Accuracy:0.587
Epoch:19 Training Loss:0.076 Validation Loss:0.046009
Validation Loss decreased:0.046272 --> 0.046009 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:20 Training Accuracy:0.593 Validation Accuracy:0.574
Epoch:20 Training Loss:0.078 Validation Loss:0.047240
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:21 Training Accuracy:0.603 Validation Accuracy:0.636

Epoch:21 Training Loss:0.072 Validation Loss:0.048323

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:22 Training Accuracy:0.601 Validation Accuracy:0.651

Epoch:22 Training Loss:0.075 Validation Loss:0.064368

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:23 Training Accuracy:0.611 Validation Accuracy:0.674

Epoch:23 Training Loss:0.078 Validation Loss:0.045848

Validation Loss decreased:0.046009 --> 0.045848 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]

100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:24 Training Accuracy:0.618 Validation Accuracy:0.636

Epoch:24 Training Loss:0.076 Validation Loss:0.050914

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:25 Training Accuracy:0.597 Validation Accuracy:0.654

Epoch:25 Training Loss:0.076 Validation Loss:0.056169

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]

100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:26 Training Accuracy:0.616 Validation Accuracy:0.661

Epoch:26 Training Loss:0.076 Validation Loss:0.050975

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:27 Training Accuracy:0.590 Validation Accuracy:0.488

Epoch:27 Training Loss:0.078 Validation Loss:0.064601

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:28 Training Accuracy:0.611 Validation Accuracy:0.636

Epoch:28 Training Loss:0.078 Validation Loss:0.050670

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:29 Training Accuracy:0.608 Validation Accuracy:0.612

Epoch:29 Training Loss:0.078 Validation Loss:0.062196

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]

100%|██████████| 3/3 [00:00<00:00, 21.45it/s]

Epochs:30 Training Accuracy:0.606 Validation Accuracy:0.628
Epoch:30 Training Loss:0.078 Validation Loss:0.045307
Validation Loss decreased:0.045848 --> 0.045307 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:31 Training Accuracy:0.604 Validation Accuracy:0.556
Epoch:31 Training Loss:0.073 Validation Loss:0.048949
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.22it/s]
100%|██████████| 3/3 [00:00<00:00, 20.81it/s]

Epochs:32 Training Accuracy:0.641 Validation Accuracy:0.579
Epoch:32 Training Loss:0.071 Validation Loss:0.051479
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:33 Training Accuracy:0.635 Validation Accuracy:0.636
Epoch:33 Training Loss:0.079 Validation Loss:0.067151
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]
100%|██████████| 3/3 [00:00<00:00, 21.34it/s]

Epochs:34 Training Accuracy:0.631 Validation Accuracy:0.545
Epoch:34 Training Loss:0.084 Validation Loss:0.044382
Validation Loss decreased:0.045307 --> 0.044382 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:35 Training Accuracy:0.615 Validation Accuracy:0.669
Epoch:35 Training Loss:0.079 Validation Loss:0.048589
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:36 Training Accuracy:0.602 Validation Accuracy:0.649
Epoch:36 Training Loss:0.074 Validation Loss:0.046370
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.09it/s]

Epochs:37 Training Accuracy:0.609 Validation Accuracy:0.612
Epoch:37 Training Loss:0.076 Validation Loss:0.047803
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:38 Training Accuracy:0.589 Validation Accuracy:0.568
Epoch:38 Training Loss:0.077 Validation Loss:0.054928
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 9.62it/s]
100%|██████████| 3/3 [00:00<00:00, 18.67it/s]

Epochs:39 Training Accuracy:0.622 Validation Accuracy:0.566

Epoch:39 Training Loss:0.088 Validation Loss:0.058906

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.23it/s]

100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:40 Training Accuracy:0.604 Validation Accuracy:0.690

Epoch:40 Training Loss:0.082 Validation Loss:0.056596

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]

100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:41 Training Accuracy:0.607 Validation Accuracy:0.669

Epoch:41 Training Loss:0.078 Validation Loss:0.054235

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]

100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:42 Training Accuracy:0.622 Validation Accuracy:0.641

Epoch:42 Training Loss:0.075 Validation Loss:0.045087

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]

100%|██████████| 3/3 [00:00<00:00, 21.40it/s]

Epochs:43 Training Accuracy:0.614 Validation Accuracy:0.574

Epoch:43 Training Loss:0.075 Validation Loss:0.046854

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 21.11it/s]

Epochs:44 Training Accuracy:0.589 Validation Accuracy:0.651

Epoch:44 Training Loss:0.073 Validation Loss:0.042192

Validation Loss decreased:0.044382 --> 0.042192 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:45 Training Accuracy:0.627 Validation Accuracy:0.605

Epoch:45 Training Loss:0.075 Validation Loss:0.043758

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]

100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:46 Training Accuracy:0.606 Validation Accuracy:0.649

Epoch:46 Training Loss:0.072 Validation Loss:0.042441

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]

100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:47 Training Accuracy:0.627 Validation Accuracy:0.504

Epoch:47 Training Loss:0.073 Validation Loss:0.050131

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]

100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:48 Training Accuracy:0.623 Validation Accuracy:0.610

Epoch:48 Training Loss:0.076 Validation Loss:0.049951

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:49 Training Accuracy:0.634 Validation Accuracy:0.649

Epoch:49 Training Loss:0.073 Validation Loss:0.051664

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:50 Training Accuracy:0.606 Validation Accuracy:0.535

Epoch:50 Training Loss:0.078 Validation Loss:0.044475

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:51 Training Accuracy:0.608 Validation Accuracy:0.499

Epoch:51 Training Loss:0.076 Validation Loss:0.045095

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:52 Training Accuracy:0.635 Validation Accuracy:0.561

Epoch:52 Training Loss:0.073 Validation Loss:0.044055

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.14it/s]

100%|██████████| 3/3 [00:00<00:00, 21.15it/s]

Epochs:53 Training Accuracy:0.628 Validation Accuracy:0.607

Epoch:53 Training Loss:0.070 Validation Loss:0.043457

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]

100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:54 Training Accuracy:0.620 Validation Accuracy:0.579

Epoch:54 Training Loss:0.070 Validation Loss:0.046373

count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:55 Training Accuracy:0.611 Validation Accuracy:0.651

Epoch:55 Training Loss:0.070 Validation Loss:0.049589

count patience:11 of 10

Meet Early Stopper so End Training...

And best Valid MAPE Loss:0.04219238832592964

Fold:4

100%|██████████| 15/15 [00:01<00:00, 10.95it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:1 Training Accuracy:0.501 Validation Accuracy:0.481

Epoch:1 Training Loss:0.961 Validation Loss:0.946103

Validation Loss decreased:inf --> 0.946103 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:2 Training Accuracy:0.496 Validation Accuracy:0.628
Epoch:2 Training Loss:0.573 Validation Loss:0.535888
Validation Loss decreased:0.946103 --> 0.535888 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:3 Training Accuracy:0.565 Validation Accuracy:0.550
Epoch:3 Training Loss:0.371 Validation Loss:0.334012
Validation Loss decreased:0.535888 --> 0.334012 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 15.88it/s]

Epochs:4 Training Accuracy:0.558 Validation Accuracy:0.519
Epoch:4 Training Loss:0.257 Validation Loss:0.216726
Validation Loss decreased:0.334012 --> 0.216726 So saving the model

100%|██████████| 15/15 [00:01<00:00, 8.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:5 Training Accuracy:0.587 Validation Accuracy:0.612
Epoch:5 Training Loss:0.161 Validation Loss:0.116716
Validation Loss decreased:0.216726 --> 0.116716 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:6 Training Accuracy:0.595 Validation Accuracy:0.623
Epoch:6 Training Loss:0.114 Validation Loss:0.068404
Validation Loss decreased:0.116716 --> 0.068404 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.28it/s]

Epochs:7 Training Accuracy:0.602 Validation Accuracy:0.576
Epoch:7 Training Loss:0.093 Validation Loss:0.063320
Validation Loss decreased:0.068404 --> 0.063320 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:8 Training Accuracy:0.606 Validation Accuracy:0.525
Epoch:8 Training Loss:0.093 Validation Loss:0.057685
Validation Loss decreased:0.063320 --> 0.057685 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:9 Training Accuracy:0.620 Validation Accuracy:0.553
Epoch:9 Training Loss:0.089 Validation Loss:0.052932
Validation Loss decreased:0.057685 --> 0.052932 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.27it/s]

Epochs:10 Training Accuracy:0.612 Validation Accuracy:0.649
Epoch:10 Training Loss:0.082 Validation Loss:0.046347
Validation Loss decreased:0.052932 --> 0.046347 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:11 Training Accuracy:0.613 Validation Accuracy:0.677
Epoch:11 Training Loss:0.090 Validation Loss:0.064758
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.16it/s]

Epochs:12 Training Accuracy:0.598 Validation Accuracy:0.672
Epoch:12 Training Loss:0.086 Validation Loss:0.047429
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:13 Training Accuracy:0.628 Validation Accuracy:0.548
Epoch:13 Training Loss:0.082 Validation Loss:0.045560
Validation Loss decreased:0.046347 --> 0.045560 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:14 Training Accuracy:0.609 Validation Accuracy:0.682
Epoch:14 Training Loss:0.087 Validation Loss:0.051513
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:15 Training Accuracy:0.636 Validation Accuracy:0.677
Epoch:15 Training Loss:0.083 Validation Loss:0.046992
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:16 Training Accuracy:0.607 Validation Accuracy:0.677
Epoch:16 Training Loss:0.086 Validation Loss:0.049522
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 18.28it/s]

Epochs:17 Training Accuracy:0.611 Validation Accuracy:0.607
Epoch:17 Training Loss:0.076 Validation Loss:0.041879
Validation Loss decreased:0.045560 --> 0.041879 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.61it/s]
100%|██████████| 3/3 [00:00<00:00, 21.29it/s]

Epochs:18 Training Accuracy:0.607 Validation Accuracy:0.672
Epoch:18 Training Loss:0.085 Validation Loss:0.047414
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 20.73it/s]

Epochs:19 Training Accuracy:0.624 Validation Accuracy:0.659
Epoch:19 Training Loss:0.080 Validation Loss:0.040084
Validation Loss decreased:0.041879 --> 0.040084 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:20 Training Accuracy:0.619 Validation Accuracy:0.659
Epoch:20 Training Loss:0.077 Validation Loss:0.045972
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.32it/s]

Epochs:21 Training Accuracy:0.613 Validation Accuracy:0.589
Epoch:21 Training Loss:0.077 Validation Loss:0.045117
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:22 Training Accuracy:0.577 Validation Accuracy:0.548
Epoch:22 Training Loss:0.080 Validation Loss:0.060469
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 20.96it/s]

Epochs:23 Training Accuracy:0.620 Validation Accuracy:0.592
Epoch:23 Training Loss:0.079 Validation Loss:0.047381
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 9.22it/s]
100%|██████████| 3/3 [00:00<00:00, 19.39it/s]

Epochs:24 Training Accuracy:0.611 Validation Accuracy:0.537
Epoch:24 Training Loss:0.081 Validation Loss:0.049407
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:25 Training Accuracy:0.623 Validation Accuracy:0.646
Epoch:25 Training Loss:0.080 Validation Loss:0.058293
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:26 Training Accuracy:0.602 Validation Accuracy:0.677
Epoch:26 Training Loss:0.077 Validation Loss:0.052679
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:27 Training Accuracy:0.622 Validation Accuracy:0.532
Epoch:27 Training Loss:0.081 Validation Loss:0.057343
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.34it/s]

Epochs:28 Training Accuracy:0.594 Validation Accuracy:0.633
Epoch:28 Training Loss:0.083 Validation Loss:0.058262
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:29 Training Accuracy:0.598 Validation Accuracy:0.659
Epoch:29 Training Loss:0.076 Validation Loss:0.046246
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.27it/s]

Epochs:30 Training Accuracy:0.610 Validation Accuracy:0.581
Epoch:30 Training Loss:0.077 Validation Loss:0.046127
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.040083665400743484
Fold:5

100%|██████████| 15/15 [00:01<00:00, 10.24it/s]
100%|██████████| 3/3 [00:00<00:00, 19.46it/s]

Epochs:1 Training Accuracy:0.504 Validation Accuracy:0.509
Epoch:1 Training Loss:0.951 Validation Loss:0.942055
Validation Loss decreased:inf --> 0.942055 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:2 Training Accuracy:0.471 Validation Accuracy:0.625
Epoch:2 Training Loss:0.545 Validation Loss:0.530382
Validation Loss decreased:0.942055 --> 0.530382 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.29it/s]

Epochs:3 Training Accuracy:0.558 Validation Accuracy:0.543
Epoch:3 Training Loss:0.356 Validation Loss:0.345072
Validation Loss decreased:0.530382 --> 0.345072 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.05it/s]

Epochs:4 Training Accuracy:0.555 Validation Accuracy:0.561
Epoch:4 Training Loss:0.250 Validation Loss:0.200276
Validation Loss decreased:0.345072 --> 0.200276 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:5 Training Accuracy:0.596 Validation Accuracy:0.607
Epoch:5 Training Loss:0.155 Validation Loss:0.120083
Validation Loss decreased:0.200276 --> 0.120083 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:6 Training Accuracy:0.622 Validation Accuracy:0.638
Epoch:6 Training Loss:0.104 Validation Loss:0.067719
Validation Loss decreased:0.120083 --> 0.067719 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 15.74it/s]

Epochs:7 Training Accuracy:0.598 Validation Accuracy:0.649
Epoch:7 Training Loss:0.090 Validation Loss:0.048876
Validation Loss decreased:0.067719 --> 0.048876 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.55it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:8 Training Accuracy:0.586 Validation Accuracy:0.630
Epoch:8 Training Loss:0.085 Validation Loss:0.054055
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:9 Training Accuracy:0.601 Validation Accuracy:0.651
Epoch:9 Training Loss:0.081 Validation Loss:0.046179
Validation Loss decreased:0.048876 --> 0.046179 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:10 Training Accuracy:0.610 Validation Accuracy:0.579
Epoch:10 Training Loss:0.080 Validation Loss:0.049835
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:11 Training Accuracy:0.592 Validation Accuracy:0.633
Epoch:11 Training Loss:0.084 Validation Loss:0.040229
Validation Loss decreased:0.046179 --> 0.040229 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:12 Training Accuracy:0.630 Validation Accuracy:0.537
Epoch:12 Training Loss:0.080 Validation Loss:0.057729
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 9.95it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:13 Training Accuracy:0.592 Validation Accuracy:0.579
Epoch:13 Training Loss:0.089 Validation Loss:0.062809
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.23it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:14 Training Accuracy:0.609 Validation Accuracy:0.643
Epoch:14 Training Loss:0.086 Validation Loss:0.064056
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:15 Training Accuracy:0.621 Validation Accuracy:0.496
Epoch:15 Training Loss:0.080 Validation Loss:0.074981
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:16 Training Accuracy:0.584 Validation Accuracy:0.599

Epoch:16 Training Loss:0.080 Validation Loss:0.048596

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:17 Training Accuracy:0.597 Validation Accuracy:0.638

Epoch:17 Training Loss:0.077 Validation Loss:0.051120

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 20.24it/s]

Epochs:18 Training Accuracy:0.618 Validation Accuracy:0.677

Epoch:18 Training Loss:0.083 Validation Loss:0.081431

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.88it/s]

Epochs:19 Training Accuracy:0.605 Validation Accuracy:0.664

Epoch:19 Training Loss:0.091 Validation Loss:0.079008

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:20 Training Accuracy:0.599 Validation Accuracy:0.618

Epoch:20 Training Loss:0.081 Validation Loss:0.042102

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:21 Training Accuracy:0.627 Validation Accuracy:0.584

Epoch:21 Training Loss:0.080 Validation Loss:0.060674

count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:22 Training Accuracy:0.606 Validation Accuracy:0.716

Epoch:22 Training Loss:0.077 Validation Loss:0.052562

count patience:11 of 10

Meet Early Stopper so End Training...

And best Valid MAPE Loss:0.0402291938662529

-----S&P500-----

Fold:1

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:1 Training Accuracy:0.502 Validation Accuracy:0.504

Epoch:1 Training Loss:0.991 Validation Loss:0.994593

Validation Loss decreased:inf --> 0.994593 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]

100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:2 Training Accuracy:0.493 Validation Accuracy:0.550

Epoch:2 Training Loss:0.880 Validation Loss:0.844068

Validation Loss decreased:0.994593 --> 0.844068 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:3 Training Accuracy:0.484 Validation Accuracy:0.548
Epoch:3 Training Loss:0.689 Validation Loss:0.589529
Validation Loss decreased:0.844068 --> 0.589529 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:4 Training Accuracy:0.576 Validation Accuracy:0.649
Epoch:4 Training Loss:0.456 Validation Loss:0.360851
Validation Loss decreased:0.589529 --> 0.360851 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:5 Training Accuracy:0.564 Validation Accuracy:0.561
Epoch:5 Training Loss:0.356 Validation Loss:0.296204
Validation Loss decreased:0.360851 --> 0.296204 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:6 Training Accuracy:0.562 Validation Accuracy:0.574
Epoch:6 Training Loss:0.299 Validation Loss:0.254278
Validation Loss decreased:0.296204 --> 0.254278 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:7 Training Accuracy:0.601 Validation Accuracy:0.654
Epoch:7 Training Loss:0.249 Validation Loss:0.204394
Validation Loss decreased:0.254278 --> 0.204394 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 20.80it/s]

Epochs:8 Training Accuracy:0.650 Validation Accuracy:0.599
Epoch:8 Training Loss:0.210 Validation Loss:0.159161
Validation Loss decreased:0.204394 --> 0.159161 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:9 Training Accuracy:0.606 Validation Accuracy:0.713
Epoch:9 Training Loss:0.163 Validation Loss:0.131645
Validation Loss decreased:0.159161 --> 0.131645 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.46it/s]
100%|██████████| 3/3 [00:00<00:00, 19.56it/s]

Epochs:10 Training Accuracy:0.639 Validation Accuracy:0.581
Epoch:10 Training Loss:0.130 Validation Loss:0.093293
Validation Loss decreased:0.131645 --> 0.093293 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:11 Training Accuracy:0.657 Validation Accuracy:0.630
Epoch:11 Training Loss:0.100 Validation Loss:0.059979
Validation Loss decreased:0.093293 --> 0.059979 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.19it/s]
100%|██████████| 3/3 [00:00<00:00, 21.45it/s]

Epochs:12 Training Accuracy:0.659 Validation Accuracy:0.698
Epoch:12 Training Loss:0.096 Validation Loss:0.057338
Validation Loss decreased:0.059979 --> 0.057338 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:13 Training Accuracy:0.669 Validation Accuracy:0.654
Epoch:13 Training Loss:0.086 Validation Loss:0.070807
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 20.43it/s]

Epochs:14 Training Accuracy:0.659 Validation Accuracy:0.682
Epoch:14 Training Loss:0.100 Validation Loss:0.051420
Validation Loss decreased:0.057338 --> 0.051420 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:15 Training Accuracy:0.682 Validation Accuracy:0.736
Epoch:15 Training Loss:0.092 Validation Loss:0.052683
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:16 Training Accuracy:0.649 Validation Accuracy:0.716
Epoch:16 Training Loss:0.095 Validation Loss:0.050603
Validation Loss decreased:0.051420 --> 0.050603 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:17 Training Accuracy:0.604 Validation Accuracy:0.672
Epoch:17 Training Loss:0.088 Validation Loss:0.046290
Validation Loss decreased:0.050603 --> 0.046290 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]
100%|██████████| 3/3 [00:00<00:00, 19.35it/s]

Epochs:18 Training Accuracy:0.640 Validation Accuracy:0.587
Epoch:18 Training Loss:0.092 Validation Loss:0.068137
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:19 Training Accuracy:0.631 Validation Accuracy:0.628
Epoch:19 Training Loss:0.102 Validation Loss:0.064156
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:20 Training Accuracy:0.681 Validation Accuracy:0.729
Epoch:20 Training Loss:0.089 Validation Loss:0.044557
Validation Loss decreased:0.046290 --> 0.044557 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:21 Training Accuracy:0.686 Validation Accuracy:0.597
Epoch:21 Training Loss:0.085 Validation Loss:0.049300
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:22 Training Accuracy:0.635 Validation Accuracy:0.589
Epoch:22 Training Loss:0.082 Validation Loss:0.041098
Validation Loss decreased:0.044557 --> 0.041098 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:23 Training Accuracy:0.632 Validation Accuracy:0.721
Epoch:23 Training Loss:0.082 Validation Loss:0.054717
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 20.95it/s]

Epochs:24 Training Accuracy:0.660 Validation Accuracy:0.612
Epoch:24 Training Loss:0.084 Validation Loss:0.064517
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.46it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:25 Training Accuracy:0.643 Validation Accuracy:0.721
Epoch:25 Training Loss:0.086 Validation Loss:0.052033
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.40it/s]

Epochs:26 Training Accuracy:0.649 Validation Accuracy:0.693
Epoch:26 Training Loss:0.082 Validation Loss:0.037328
Validation Loss decreased:0.041098 --> 0.037328 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:27 Training Accuracy:0.667 Validation Accuracy:0.698
Epoch:27 Training Loss:0.082 Validation Loss:0.050219
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:28 Training Accuracy:0.685 Validation Accuracy:0.589
Epoch:28 Training Loss:0.083 Validation Loss:0.044725
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 19.84it/s]

Epochs:29 Training Accuracy:0.705 Validation Accuracy:0.664
Epoch:29 Training Loss:0.084 Validation Loss:0.040779
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.10it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:30 Training Accuracy:0.663 Validation Accuracy:0.615
Epoch:30 Training Loss:0.081 Validation Loss:0.038751
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.29it/s]

Epochs:31 Training Accuracy:0.647 Validation Accuracy:0.615
Epoch:31 Training Loss:0.082 Validation Loss:0.044395
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:32 Training Accuracy:0.670 Validation Accuracy:0.667
Epoch:32 Training Loss:0.084 Validation Loss:0.046326
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:33 Training Accuracy:0.653 Validation Accuracy:0.602
Epoch:33 Training Loss:0.084 Validation Loss:0.078452
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:34 Training Accuracy:0.664 Validation Accuracy:0.708
Epoch:34 Training Loss:0.087 Validation Loss:0.044504
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:35 Training Accuracy:0.677 Validation Accuracy:0.767
Epoch:35 Training Loss:0.081 Validation Loss:0.039884
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:36 Training Accuracy:0.686 Validation Accuracy:0.708
Epoch:36 Training Loss:0.078 Validation Loss:0.050528
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:37 Training Accuracy:0.659 Validation Accuracy:0.649
Epoch:37 Training Loss:0.072 Validation Loss:0.043321
count patience:11 of 10

Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03732750937342644
Fold:2

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:1 Training Accuracy:0.512 Validation Accuracy:0.499

Epoch:1 Training Loss:0.993 Validation Loss:0.995320

Validation Loss decreased:inf --> 0.995320 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]

100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:2 Training Accuracy:0.486 Validation Accuracy:0.504

Epoch:2 Training Loss:0.904 Validation Loss:0.857378

Validation Loss decreased:0.995320 --> 0.857378 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]

100%|██████████| 3/3 [00:00<00:00, 21.27it/s]

Epochs:3 Training Accuracy:0.465 Validation Accuracy:0.468

Epoch:3 Training Loss:0.704 Validation Loss:0.584979

Validation Loss decreased:0.857378 --> 0.584979 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:4 Training Accuracy:0.568 Validation Accuracy:0.636

Epoch:4 Training Loss:0.482 Validation Loss:0.365983

Validation Loss decreased:0.584979 --> 0.365983 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]

100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:5 Training Accuracy:0.596 Validation Accuracy:0.625

Epoch:5 Training Loss:0.337 Validation Loss:0.302660

Validation Loss decreased:0.365983 --> 0.302660 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:6 Training Accuracy:0.597 Validation Accuracy:0.618

Epoch:6 Training Loss:0.284 Validation Loss:0.229496

Validation Loss decreased:0.302660 --> 0.229496 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]

100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:7 Training Accuracy:0.595 Validation Accuracy:0.703

Epoch:7 Training Loss:0.231 Validation Loss:0.196205

Validation Loss decreased:0.229496 --> 0.196205 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]

100%|██████████| 3/3 [00:00<00:00, 21.05it/s]

Epochs:8 Training Accuracy:0.645 Validation Accuracy:0.623

Epoch:8 Training Loss:0.203 Validation Loss:0.150602

Validation Loss decreased:0.196205 --> 0.150602 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:9 Training Accuracy:0.650 Validation Accuracy:0.682

Epoch:9 Training Loss:0.176 Validation Loss:0.124902

Validation Loss decreased:0.150602 --> 0.124902 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:10 Training Accuracy:0.649 Validation Accuracy:0.661
Epoch:10 Training Loss:0.127 Validation Loss:0.084314
Validation Loss decreased:0.124902 --> 0.084314 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 19.57it/s]

Epochs:11 Training Accuracy:0.640 Validation Accuracy:0.677
Epoch:11 Training Loss:0.101 Validation Loss:0.055156
Validation Loss decreased:0.084314 --> 0.055156 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.35it/s]
100%|██████████| 3/3 [00:00<00:00, 21.06it/s]

Epochs:12 Training Accuracy:0.666 Validation Accuracy:0.705
Epoch:12 Training Loss:0.095 Validation Loss:0.056771
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:13 Training Accuracy:0.657 Validation Accuracy:0.682
Epoch:13 Training Loss:0.100 Validation Loss:0.052310
Validation Loss decreased:0.055156 --> 0.052310 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.24it/s]
100%|██████████| 3/3 [00:00<00:00, 20.02it/s]

Epochs:14 Training Accuracy:0.659 Validation Accuracy:0.680
Epoch:14 Training Loss:0.085 Validation Loss:0.071798
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:15 Training Accuracy:0.653 Validation Accuracy:0.695
Epoch:15 Training Loss:0.090 Validation Loss:0.037946
Validation Loss decreased:0.052310 --> 0.037946 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:16 Training Accuracy:0.686 Validation Accuracy:0.674
Epoch:16 Training Loss:0.082 Validation Loss:0.058319
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:17 Training Accuracy:0.691 Validation Accuracy:0.695
Epoch:17 Training Loss:0.082 Validation Loss:0.067843
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:18 Training Accuracy:0.647 Validation Accuracy:0.739
Epoch:18 Training Loss:0.092 Validation Loss:0.092221
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:19 Training Accuracy:0.653 Validation Accuracy:0.747

Epoch:19 Training Loss:0.092 Validation Loss:0.064432

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:20 Training Accuracy:0.714 Validation Accuracy:0.703

Epoch:20 Training Loss:0.084 Validation Loss:0.053930

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.48it/s]

100%|██████████| 3/3 [00:00<00:00, 20.36it/s]

Epochs:21 Training Accuracy:0.657 Validation Accuracy:0.636

Epoch:21 Training Loss:0.086 Validation Loss:0.048997

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:22 Training Accuracy:0.641 Validation Accuracy:0.633

Epoch:22 Training Loss:0.085 Validation Loss:0.046567

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:23 Training Accuracy:0.666 Validation Accuracy:0.698

Epoch:23 Training Loss:0.082 Validation Loss:0.037710

Validation Loss decreased:0.037946 --> 0.037710 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:24 Training Accuracy:0.648 Validation Accuracy:0.649

Epoch:24 Training Loss:0.078 Validation Loss:0.057205

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:25 Training Accuracy:0.653 Validation Accuracy:0.773

Epoch:25 Training Loss:0.086 Validation Loss:0.062951

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:26 Training Accuracy:0.683 Validation Accuracy:0.563

Epoch:26 Training Loss:0.087 Validation Loss:0.057572

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 19.71it/s]

Epochs:27 Training Accuracy:0.648 Validation Accuracy:0.628

Epoch:27 Training Loss:0.078 Validation Loss:0.055751

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]

100%|██████████| 3/3 [00:00<00:00, 21.12it/s]

Epochs:28 Training Accuracy:0.639 Validation Accuracy:0.703

Epoch:28 Training Loss:0.085 Validation Loss:0.063680

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:29 Training Accuracy:0.636 Validation Accuracy:0.698

Epoch:29 Training Loss:0.080 Validation Loss:0.040031

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 20.99it/s]

Epochs:30 Training Accuracy:0.694 Validation Accuracy:0.667

Epoch:30 Training Loss:0.083 Validation Loss:0.039608

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 18.96it/s]

Epochs:31 Training Accuracy:0.625 Validation Accuracy:0.690

Epoch:31 Training Loss:0.082 Validation Loss:0.040601

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 9.71it/s]

100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:32 Training Accuracy:0.673 Validation Accuracy:0.646

Epoch:32 Training Loss:0.078 Validation Loss:0.035904

Validation Loss decreased:0.037710 --> 0.035904 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:33 Training Accuracy:0.671 Validation Accuracy:0.587

Epoch:33 Training Loss:0.074 Validation Loss:0.040080

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:34 Training Accuracy:0.665 Validation Accuracy:0.695

Epoch:34 Training Loss:0.081 Validation Loss:0.035581

Validation Loss decreased:0.035904 --> 0.035581 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.01it/s]

100%|██████████| 3/3 [00:00<00:00, 20.83it/s]

Epochs:35 Training Accuracy:0.703 Validation Accuracy:0.625

Epoch:35 Training Loss:0.081 Validation Loss:0.034254

Validation Loss decreased:0.035581 --> 0.034254 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.51it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:36 Training Accuracy:0.652 Validation Accuracy:0.734

Epoch:36 Training Loss:0.072 Validation Loss:0.039661

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:37 Training Accuracy:0.676 Validation Accuracy:0.721
Epoch:37 Training Loss:0.077 Validation Loss:0.047361
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:38 Training Accuracy:0.642 Validation Accuracy:0.726
Epoch:38 Training Loss:0.076 Validation Loss:0.040624
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:39 Training Accuracy:0.683 Validation Accuracy:0.711
Epoch:39 Training Loss:0.082 Validation Loss:0.051510
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:40 Training Accuracy:0.684 Validation Accuracy:0.736
Epoch:40 Training Loss:0.078 Validation Loss:0.036329
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:41 Training Accuracy:0.616 Validation Accuracy:0.651
Epoch:41 Training Loss:0.077 Validation Loss:0.036173
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:42 Training Accuracy:0.660 Validation Accuracy:0.760
Epoch:42 Training Loss:0.079 Validation Loss:0.038201
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.11it/s]

Epochs:43 Training Accuracy:0.642 Validation Accuracy:0.718
Epoch:43 Training Loss:0.077 Validation Loss:0.031388
Validation Loss decreased:0.034254 --> 0.031388 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:44 Training Accuracy:0.692 Validation Accuracy:0.698
Epoch:44 Training Loss:0.077 Validation Loss:0.047700
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:45 Training Accuracy:0.694 Validation Accuracy:0.643
Epoch:45 Training Loss:0.075 Validation Loss:0.040680
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:46 Training Accuracy:0.656 Validation Accuracy:0.700
Epoch:46 Training Loss:0.076 Validation Loss:0.035773
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:47 Training Accuracy:0.648 Validation Accuracy:0.687
Epoch:47 Training Loss:0.080 Validation Loss:0.063633
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:48 Training Accuracy:0.647 Validation Accuracy:0.721
Epoch:48 Training Loss:0.083 Validation Loss:0.035771
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.32it/s]
100%|██████████| 3/3 [00:00<00:00, 20.90it/s]

Epochs:49 Training Accuracy:0.674 Validation Accuracy:0.545
Epoch:49 Training Loss:0.076 Validation Loss:0.037463
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:50 Training Accuracy:0.625 Validation Accuracy:0.636
Epoch:50 Training Loss:0.074 Validation Loss:0.046084
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.35it/s]
100%|██████████| 3/3 [00:00<00:00, 19.10it/s]

Epochs:51 Training Accuracy:0.648 Validation Accuracy:0.726
Epoch:51 Training Loss:0.073 Validation Loss:0.040973
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.48it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:52 Training Accuracy:0.681 Validation Accuracy:0.708
Epoch:52 Training Loss:0.079 Validation Loss:0.039817
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:53 Training Accuracy:0.662 Validation Accuracy:0.612
Epoch:53 Training Loss:0.075 Validation Loss:0.052269
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:54 Training Accuracy:0.654 Validation Accuracy:0.646
Epoch:54 Training Loss:0.078 Validation Loss:0.040705
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03138785436749458
Fold:3

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:1 Training Accuracy:0.494 Validation Accuracy:0.488
Epoch:1 Training Loss:0.992 Validation Loss:0.995250
Validation Loss decreased:inf --> 0.995250 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.51it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:2 Training Accuracy:0.501 Validation Accuracy:0.475
Epoch:2 Training Loss:0.903 Validation Loss:0.864912
Validation Loss decreased:0.995250 --> 0.864912 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.92it/s]

Epochs:3 Training Accuracy:0.478 Validation Accuracy:0.568
Epoch:3 Training Loss:0.698 Validation Loss:0.588119
Validation Loss decreased:0.864912 --> 0.588119 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.93it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:4 Training Accuracy:0.564 Validation Accuracy:0.589
Epoch:4 Training Loss:0.482 Validation Loss:0.377630
Validation Loss decreased:0.588119 --> 0.377630 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:5 Training Accuracy:0.632 Validation Accuracy:0.615
Epoch:5 Training Loss:0.357 Validation Loss:0.329451
Validation Loss decreased:0.377630 --> 0.329451 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:6 Training Accuracy:0.586 Validation Accuracy:0.568
Epoch:6 Training Loss:0.295 Validation Loss:0.245810
Validation Loss decreased:0.329451 --> 0.245810 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:7 Training Accuracy:0.633 Validation Accuracy:0.589
Epoch:7 Training Loss:0.246 Validation Loss:0.210618
Validation Loss decreased:0.245810 --> 0.210618 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:8 Training Accuracy:0.638 Validation Accuracy:0.633
Epoch:8 Training Loss:0.198 Validation Loss:0.148486
Validation Loss decreased:0.210618 --> 0.148486 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.34it/s]

Epochs:9 Training Accuracy:0.636 Validation Accuracy:0.661
Epoch:9 Training Loss:0.164 Validation Loss:0.121047
Validation Loss decreased:0.148486 --> 0.121047 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:10 Training Accuracy:0.656 Validation Accuracy:0.602
Epoch:10 Training Loss:0.122 Validation Loss:0.086576
Validation Loss decreased:0.121047 --> 0.086576 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:11 Training Accuracy:0.651 Validation Accuracy:0.636
Epoch:11 Training Loss:0.096 Validation Loss:0.054596
Validation Loss decreased:0.086576 --> 0.054596 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:12 Training Accuracy:0.641 Validation Accuracy:0.680
Epoch:12 Training Loss:0.091 Validation Loss:0.057554
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:13 Training Accuracy:0.666 Validation Accuracy:0.638
Epoch:13 Training Loss:0.092 Validation Loss:0.055923
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:14 Training Accuracy:0.653 Validation Accuracy:0.625
Epoch:14 Training Loss:0.087 Validation Loss:0.046238
Validation Loss decreased:0.054596 --> 0.046238 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:15 Training Accuracy:0.657 Validation Accuracy:0.669
Epoch:15 Training Loss:0.080 Validation Loss:0.046580
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 9.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:16 Training Accuracy:0.643 Validation Accuracy:0.765
Epoch:16 Training Loss:0.092 Validation Loss:0.051772
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:17 Training Accuracy:0.682 Validation Accuracy:0.633
Epoch:17 Training Loss:0.086 Validation Loss:0.043298
Validation Loss decreased:0.046238 --> 0.043298 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:18 Training Accuracy:0.645 Validation Accuracy:0.698
Epoch:18 Training Loss:0.089 Validation Loss:0.041194
Validation Loss decreased:0.043298 --> 0.041194 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:19 Training Accuracy:0.659 Validation Accuracy:0.718
Epoch:19 Training Loss:0.078 Validation Loss:0.045599
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 20.93it/s]

Epochs:20 Training Accuracy:0.638 Validation Accuracy:0.718
Epoch:20 Training Loss:0.093 Validation Loss:0.062048
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 9.96it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:21 Training Accuracy:0.624 Validation Accuracy:0.693
Epoch:21 Training Loss:0.084 Validation Loss:0.057339
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:22 Training Accuracy:0.655 Validation Accuracy:0.618
Epoch:22 Training Loss:0.082 Validation Loss:0.042226
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:23 Training Accuracy:0.650 Validation Accuracy:0.687
Epoch:23 Training Loss:0.075 Validation Loss:0.050831
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:24 Training Accuracy:0.664 Validation Accuracy:0.636
Epoch:24 Training Loss:0.086 Validation Loss:0.045122
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.84it/s]

Epochs:25 Training Accuracy:0.712 Validation Accuracy:0.680
Epoch:25 Training Loss:0.087 Validation Loss:0.054479
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:26 Training Accuracy:0.666 Validation Accuracy:0.643
Epoch:26 Training Loss:0.093 Validation Loss:0.078969
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:27 Training Accuracy:0.639 Validation Accuracy:0.656
Epoch:27 Training Loss:0.085 Validation Loss:0.056337
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.40it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:28 Training Accuracy:0.656 Validation Accuracy:0.643
Epoch:28 Training Loss:0.085 Validation Loss:0.059638
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:29 Training Accuracy:0.678 Validation Accuracy:0.667
Epoch:29 Training Loss:0.084 Validation Loss:0.047337
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.04119392856955528
Fold:4

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:1 Training Accuracy:0.495 Validation Accuracy:0.512
Epoch:1 Training Loss:0.992 Validation Loss:0.995729
Validation Loss decreased:inf --> 0.995729 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:2 Training Accuracy:0.494 Validation Accuracy:0.517
Epoch:2 Training Loss:0.895 Validation Loss:0.875212
Validation Loss decreased:0.995729 --> 0.875212 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 20.10it/s]

Epochs:3 Training Accuracy:0.452 Validation Accuracy:0.553
Epoch:3 Training Loss:0.695 Validation Loss:0.606998
Validation Loss decreased:0.875212 --> 0.606998 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:4 Training Accuracy:0.590 Validation Accuracy:0.638
Epoch:4 Training Loss:0.479 Validation Loss:0.416335
Validation Loss decreased:0.606998 --> 0.416335 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]
100%|██████████| 3/3 [00:00<00:00, 21.21it/s]

Epochs:5 Training Accuracy:0.576 Validation Accuracy:0.630
Epoch:5 Training Loss:0.368 Validation Loss:0.327939
Validation Loss decreased:0.416335 --> 0.327939 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.11it/s]
100%|██████████| 3/3 [00:00<00:00, 19.09it/s]

Epochs:6 Training Accuracy:0.577 Validation Accuracy:0.599
Epoch:6 Training Loss:0.294 Validation Loss:0.244386
Validation Loss decreased:0.327939 --> 0.244386 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:7 Training Accuracy:0.603 Validation Accuracy:0.724

Epoch:7 Training Loss:0.238 Validation Loss:0.181857

Validation Loss decreased:0.244386 --> 0.181857 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.50it/s]

100%|██████████| 3/3 [00:00<00:00, 20.93it/s]

Epochs:8 Training Accuracy:0.644 Validation Accuracy:0.669

Epoch:8 Training Loss:0.186 Validation Loss:0.136586

Validation Loss decreased:0.181857 --> 0.136586 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:9 Training Accuracy:0.639 Validation Accuracy:0.643

Epoch:9 Training Loss:0.141 Validation Loss:0.102882

Validation Loss decreased:0.136586 --> 0.102882 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:10 Training Accuracy:0.698 Validation Accuracy:0.664

Epoch:10 Training Loss:0.117 Validation Loss:0.059469

Validation Loss decreased:0.102882 --> 0.059469 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.13it/s]

100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:11 Training Accuracy:0.675 Validation Accuracy:0.628

Epoch:11 Training Loss:0.096 Validation Loss:0.067810

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:12 Training Accuracy:0.625 Validation Accuracy:0.693

Epoch:12 Training Loss:0.097 Validation Loss:0.048797

Validation Loss decreased:0.059469 --> 0.048797 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:13 Training Accuracy:0.664 Validation Accuracy:0.693

Epoch:13 Training Loss:0.089 Validation Loss:0.051164

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]

100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:14 Training Accuracy:0.682 Validation Accuracy:0.711

Epoch:14 Training Loss:0.084 Validation Loss:0.044642

Validation Loss decreased:0.048797 --> 0.044642 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:15 Training Accuracy:0.656 Validation Accuracy:0.628

Epoch:15 Training Loss:0.089 Validation Loss:0.072212

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]

100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:16 Training Accuracy:0.676 Validation Accuracy:0.672
Epoch:16 Training Loss:0.091 Validation Loss:0.041222
Validation Loss decreased:0.044642 --> 0.041222 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:17 Training Accuracy:0.656 Validation Accuracy:0.661
Epoch:17 Training Loss:0.080 Validation Loss:0.057479
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.28it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:18 Training Accuracy:0.641 Validation Accuracy:0.659
Epoch:18 Training Loss:0.088 Validation Loss:0.051117
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:19 Training Accuracy:0.685 Validation Accuracy:0.700
Epoch:19 Training Loss:0.087 Validation Loss:0.037289
Validation Loss decreased:0.041222 --> 0.037289 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 20.94it/s]

Epochs:20 Training Accuracy:0.633 Validation Accuracy:0.561
Epoch:20 Training Loss:0.073 Validation Loss:0.034911
Validation Loss decreased:0.037289 --> 0.034911 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:21 Training Accuracy:0.678 Validation Accuracy:0.566
Epoch:21 Training Loss:0.083 Validation Loss:0.038504
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:22 Training Accuracy:0.689 Validation Accuracy:0.682
Epoch:22 Training Loss:0.082 Validation Loss:0.040721
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:23 Training Accuracy:0.646 Validation Accuracy:0.654
Epoch:23 Training Loss:0.088 Validation Loss:0.046721
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 16.94it/s]

Epochs:24 Training Accuracy:0.682 Validation Accuracy:0.636
Epoch:24 Training Loss:0.078 Validation Loss:0.037790
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 9.04it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:25 Training Accuracy:0.654 Validation Accuracy:0.643
Epoch:25 Training Loss:0.087 Validation Loss:0.038040
count patience:5 of 10
100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:26 Training Accuracy:0.688 Validation Accuracy:0.649
Epoch:26 Training Loss:0.079 Validation Loss:0.051014
count patience:6 of 10
100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:27 Training Accuracy:0.674 Validation Accuracy:0.651
Epoch:27 Training Loss:0.079 Validation Loss:0.053474
count patience:7 of 10
100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:28 Training Accuracy:0.678 Validation Accuracy:0.680
Epoch:28 Training Loss:0.079 Validation Loss:0.039630
count patience:8 of 10
100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:29 Training Accuracy:0.659 Validation Accuracy:0.597
Epoch:29 Training Loss:0.076 Validation Loss:0.037514
count patience:9 of 10
100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:30 Training Accuracy:0.609 Validation Accuracy:0.667
Epoch:30 Training Loss:0.081 Validation Loss:0.035555
count patience:10 of 10
100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 18.55it/s]

Epochs:31 Training Accuracy:0.649 Validation Accuracy:0.687
Epoch:31 Training Loss:0.087 Validation Loss:0.054945
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03491085022687912
Fold:5

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]
100%|██████████| 3/3 [00:00<00:00, 21.01it/s]

Epochs:1 Training Accuracy:0.497 Validation Accuracy:0.512
Epoch:1 Training Loss:0.992 Validation Loss:0.995503
Validation Loss decreased:inf --> 0.995503 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:2 Training Accuracy:0.497 Validation Accuracy:0.527
Epoch:2 Training Loss:0.894 Validation Loss:0.874556
Validation Loss decreased:0.995503 --> 0.874556 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.94it/s]

Epochs:3 Training Accuracy:0.496 Validation Accuracy:0.486
Epoch:3 Training Loss:0.701 Validation Loss:0.646420
Validation Loss decreased:0.874556 --> 0.646420 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:4 Training Accuracy:0.531 Validation Accuracy:0.641
Epoch:4 Training Loss:0.491 Validation Loss:0.403574
Validation Loss decreased:0.646420 --> 0.403574 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:5 Training Accuracy:0.564 Validation Accuracy:0.597
Epoch:5 Training Loss:0.334 Validation Loss:0.329579
Validation Loss decreased:0.403574 --> 0.329579 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:6 Training Accuracy:0.590 Validation Accuracy:0.550
Epoch:6 Training Loss:0.286 Validation Loss:0.234668
Validation Loss decreased:0.329579 --> 0.234668 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.49it/s]
100%|██████████| 3/3 [00:00<00:00, 21.06it/s]

Epochs:7 Training Accuracy:0.601 Validation Accuracy:0.674
Epoch:7 Training Loss:0.218 Validation Loss:0.174026
Validation Loss decreased:0.234668 --> 0.174026 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:8 Training Accuracy:0.624 Validation Accuracy:0.667
Epoch:8 Training Loss:0.167 Validation Loss:0.124972
Validation Loss decreased:0.174026 --> 0.124972 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:9 Training Accuracy:0.652 Validation Accuracy:0.731
Epoch:9 Training Loss:0.144 Validation Loss:0.082443
Validation Loss decreased:0.124972 --> 0.082443 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:10 Training Accuracy:0.670 Validation Accuracy:0.545
Epoch:10 Training Loss:0.109 Validation Loss:0.078718
Validation Loss decreased:0.082443 --> 0.078718 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.56it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:11 Training Accuracy:0.680 Validation Accuracy:0.623
Epoch:11 Training Loss:0.098 Validation Loss:0.057083
Validation Loss decreased:0.078718 --> 0.057083 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 19.68it/s]

Epochs:12 Training Accuracy:0.678 Validation Accuracy:0.736
Epoch:12 Training Loss:0.093 Validation Loss:0.051261
Validation Loss decreased:0.057083 --> 0.051261 So saving the model

100%|██████████| 15/15 [00:01<00:00, 8.15it/s]
100%|██████████| 3/3 [00:00<00:00, 20.50it/s]

Epochs:13 Training Accuracy:0.666 Validation Accuracy:0.674
Epoch:13 Training Loss:0.105 Validation Loss:0.055230
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:14 Training Accuracy:0.674 Validation Accuracy:0.599
Epoch:14 Training Loss:0.084 Validation Loss:0.047096
Validation Loss decreased:0.051261 --> 0.047096 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:15 Training Accuracy:0.650 Validation Accuracy:0.646
Epoch:15 Training Loss:0.092 Validation Loss:0.084004
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:16 Training Accuracy:0.643 Validation Accuracy:0.669
Epoch:16 Training Loss:0.087 Validation Loss:0.053421
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:17 Training Accuracy:0.695 Validation Accuracy:0.721
Epoch:17 Training Loss:0.083 Validation Loss:0.047243
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:18 Training Accuracy:0.655 Validation Accuracy:0.677
Epoch:18 Training Loss:0.082 Validation Loss:0.042585
Validation Loss decreased:0.047096 --> 0.042585 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.11it/s]
100%|██████████| 3/3 [00:00<00:00, 20.72it/s]

Epochs:19 Training Accuracy:0.684 Validation Accuracy:0.625
Epoch:19 Training Loss:0.079 Validation Loss:0.055077
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:20 Training Accuracy:0.642 Validation Accuracy:0.677
Epoch:20 Training Loss:0.090 Validation Loss:0.039345
Validation Loss decreased:0.042585 --> 0.039345 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:21 Training Accuracy:0.660 Validation Accuracy:0.646
Epoch:21 Training Loss:0.080 Validation Loss:0.043992
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:22 Training Accuracy:0.652 Validation Accuracy:0.584
Epoch:22 Training Loss:0.086 Validation Loss:0.040263
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.36it/s]

Epochs:23 Training Accuracy:0.675 Validation Accuracy:0.664
Epoch:23 Training Loss:0.078 Validation Loss:0.044999
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:24 Training Accuracy:0.615 Validation Accuracy:0.667
Epoch:24 Training Loss:0.077 Validation Loss:0.040963
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 18.04it/s]

Epochs:25 Training Accuracy:0.619 Validation Accuracy:0.698
Epoch:25 Training Loss:0.077 Validation Loss:0.040278
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.23it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:26 Training Accuracy:0.661 Validation Accuracy:0.667
Epoch:26 Training Loss:0.076 Validation Loss:0.038956
Validation Loss decreased:0.039345 --> 0.038956 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:27 Training Accuracy:0.709 Validation Accuracy:0.659
Epoch:27 Training Loss:0.079 Validation Loss:0.042833
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:28 Training Accuracy:0.641 Validation Accuracy:0.610
Epoch:28 Training Loss:0.076 Validation Loss:0.038179
Validation Loss decreased:0.038956 --> 0.038179 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.03it/s]

Epochs:29 Training Accuracy:0.614 Validation Accuracy:0.664
Epoch:29 Training Loss:0.082 Validation Loss:0.055610
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:30 Training Accuracy:0.651 Validation Accuracy:0.620
Epoch:30 Training Loss:0.085 Validation Loss:0.036325
Validation Loss decreased:0.038179 --> 0.036325 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 20.54it/s]

Epochs:31 Training Accuracy:0.611 Validation Accuracy:0.641
Epoch:31 Training Loss:0.078 Validation Loss:0.041336
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.04it/s]
100%|██████████| 3/3 [00:00<00:00, 18.83it/s]

Epochs:32 Training Accuracy:0.638 Validation Accuracy:0.693
Epoch:32 Training Loss:0.082 Validation Loss:0.038408
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 9.95it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:33 Training Accuracy:0.651 Validation Accuracy:0.633
Epoch:33 Training Loss:0.085 Validation Loss:0.040298
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 5.85it/s]

Epochs:34 Training Accuracy:0.663 Validation Accuracy:0.757
Epoch:34 Training Loss:0.079 Validation Loss:0.034808
Validation Loss decreased:0.036325 --> 0.034808 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:35 Training Accuracy:0.675 Validation Accuracy:0.641
Epoch:35 Training Loss:0.088 Validation Loss:0.041086
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:36 Training Accuracy:0.715 Validation Accuracy:0.695
Epoch:36 Training Loss:0.080 Validation Loss:0.047790
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.12it/s]

Epochs:37 Training Accuracy:0.672 Validation Accuracy:0.664
Epoch:37 Training Loss:0.082 Validation Loss:0.045231
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 20.20it/s]

Epochs:38 Training Accuracy:0.648 Validation Accuracy:0.682
Epoch:38 Training Loss:0.085 Validation Loss:0.035316
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.41it/s]
100%|██████████| 3/3 [00:00<00:00, 19.23it/s]

Epochs:39 Training Accuracy:0.680 Validation Accuracy:0.734
Epoch:39 Training Loss:0.074 Validation Loss:0.048162
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:40 Training Accuracy:0.672 Validation Accuracy:0.638
Epoch:40 Training Loss:0.075 Validation Loss:0.041441
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:41 Training Accuracy:0.665 Validation Accuracy:0.690
Epoch:41 Training Loss:0.073 Validation Loss:0.055708
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:42 Training Accuracy:0.638 Validation Accuracy:0.703
Epoch:42 Training Loss:0.082 Validation Loss:0.038704
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:43 Training Accuracy:0.656 Validation Accuracy:0.651
Epoch:43 Training Loss:0.075 Validation Loss:0.041991
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:44 Training Accuracy:0.694 Validation Accuracy:0.672
Epoch:44 Training Loss:0.082 Validation Loss:0.052181
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:45 Training Accuracy:0.642 Validation Accuracy:0.752
Epoch:45 Training Loss:0.094 Validation Loss:0.034568
Validation Loss decreased:0.034808 --> 0.034568 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.31it/s]
100%|██████████| 3/3 [00:00<00:00, 19.63it/s]

Epochs:46 Training Accuracy:0.653 Validation Accuracy:0.574
Epoch:46 Training Loss:0.086 Validation Loss:0.042635
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.61it/s]
100%|██████████| 3/3 [00:00<00:00, 21.20it/s]

Epochs:47 Training Accuracy:0.659 Validation Accuracy:0.708
Epoch:47 Training Loss:0.077 Validation Loss:0.042998
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:48 Training Accuracy:0.668 Validation Accuracy:0.680
Epoch:48 Training Loss:0.078 Validation Loss:0.036441
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:49 Training Accuracy:0.653 Validation Accuracy:0.698
Epoch:49 Training Loss:0.070 Validation Loss:0.037353
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 20.97it/s]

Epochs:50 Training Accuracy:0.650 Validation Accuracy:0.718
Epoch:50 Training Loss:0.072 Validation Loss:0.044643
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:51 Training Accuracy:0.683 Validation Accuracy:0.685
Epoch:51 Training Loss:0.079 Validation Loss:0.035259
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]
100%|██████████| 3/3 [00:00<00:00, 19.19it/s]

Epochs:52 Training Accuracy:0.644 Validation Accuracy:0.594
Epoch:52 Training Loss:0.083 Validation Loss:0.037955
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]
100%|██████████| 3/3 [00:00<00:00, 19.04it/s]

Epochs:53 Training Accuracy:0.687 Validation Accuracy:0.568
Epoch:53 Training Loss:0.077 Validation Loss:0.060297
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:54 Training Accuracy:0.672 Validation Accuracy:0.584
Epoch:54 Training Loss:0.086 Validation Loss:0.048928
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:55 Training Accuracy:0.625 Validation Accuracy:0.667
Epoch:55 Training Loss:0.075 Validation Loss:0.048671
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:56 Training Accuracy:0.638 Validation Accuracy:0.610
Epoch:56 Training Loss:0.072 Validation Loss:0.040295
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.034567587077617645
-----KOSDAQ-----

Fold:1

100%|██████████| 15/15 [00:01<00:00, 10.95it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:1 Training Accuracy:0.500 Validation Accuracy:0.488
Epoch:1 Training Loss:0.977 Validation Loss:0.984759
Validation Loss decreased:inf --> 0.984759 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:2 Training Accuracy:0.466 Validation Accuracy:0.488
Epoch:2 Training Loss:0.738 Validation Loss:0.597920
Validation Loss decreased:0.984759 --> 0.597920 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:3 Training Accuracy:0.522 Validation Accuracy:0.612
Epoch:3 Training Loss:0.461 Validation Loss:0.365098
Validation Loss decreased:0.597920 --> 0.365098 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.49it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:4 Training Accuracy:0.602 Validation Accuracy:0.581
Epoch:4 Training Loss:0.343 Validation Loss:0.302065
Validation Loss decreased:0.365098 --> 0.302065 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:5 Training Accuracy:0.581 Validation Accuracy:0.674
Epoch:5 Training Loss:0.268 Validation Loss:0.226834
Validation Loss decreased:0.302065 --> 0.226834 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:6 Training Accuracy:0.641 Validation Accuracy:0.589
Epoch:6 Training Loss:0.205 Validation Loss:0.181411
Validation Loss decreased:0.226834 --> 0.181411 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:7 Training Accuracy:0.649 Validation Accuracy:0.685
Epoch:7 Training Loss:0.146 Validation Loss:0.103243
Validation Loss decreased:0.181411 --> 0.103243 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:8 Training Accuracy:0.620 Validation Accuracy:0.581
Epoch:8 Training Loss:0.109 Validation Loss:0.072200
Validation Loss decreased:0.103243 --> 0.072200 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:9 Training Accuracy:0.677 Validation Accuracy:0.698
Epoch:9 Training Loss:0.095 Validation Loss:0.056205
Validation Loss decreased:0.072200 --> 0.056205 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.32it/s]
100%|██████████| 3/3 [00:00<00:00, 20.32it/s]

Epochs:10 Training Accuracy:0.589 Validation Accuracy:0.651
Epoch:10 Training Loss:0.093 Validation Loss:0.059909
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:11 Training Accuracy:0.640 Validation Accuracy:0.641
Epoch:11 Training Loss:0.090 Validation Loss:0.052440
Validation Loss decreased:0.056205 --> 0.052440 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:12 Training Accuracy:0.654 Validation Accuracy:0.661
Epoch:12 Training Loss:0.092 Validation Loss:0.058615
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:13 Training Accuracy:0.630 Validation Accuracy:0.630
Epoch:13 Training Loss:0.091 Validation Loss:0.071798
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:14 Training Accuracy:0.658 Validation Accuracy:0.530
Epoch:14 Training Loss:0.090 Validation Loss:0.065786
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 19.32it/s]

Epochs:15 Training Accuracy:0.632 Validation Accuracy:0.584
Epoch:15 Training Loss:0.087 Validation Loss:0.055973
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:16 Training Accuracy:0.618 Validation Accuracy:0.592
Epoch:16 Training Loss:0.088 Validation Loss:0.054422
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:17 Training Accuracy:0.667 Validation Accuracy:0.602
Epoch:17 Training Loss:0.083 Validation Loss:0.054244
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:18 Training Accuracy:0.669 Validation Accuracy:0.690
Epoch:18 Training Loss:0.093 Validation Loss:0.058077
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:19 Training Accuracy:0.638 Validation Accuracy:0.698
Epoch:19 Training Loss:0.091 Validation Loss:0.060180
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:20 Training Accuracy:0.658 Validation Accuracy:0.654
Epoch:20 Training Loss:0.089 Validation Loss:0.056203
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:21 Training Accuracy:0.643 Validation Accuracy:0.664
Epoch:21 Training Loss:0.084 Validation Loss:0.061923
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:22 Training Accuracy:0.652 Validation Accuracy:0.623
Epoch:22 Training Loss:0.091 Validation Loss:0.052032
Validation Loss decreased:0.052440 --> 0.052032 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:23 Training Accuracy:0.653 Validation Accuracy:0.587
Epoch:23 Training Loss:0.092 Validation Loss:0.050565
Validation Loss decreased:0.052032 --> 0.050565 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.34it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:24 Training Accuracy:0.607 Validation Accuracy:0.643
Epoch:24 Training Loss:0.082 Validation Loss:0.050826
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:25 Training Accuracy:0.652 Validation Accuracy:0.752
Epoch:25 Training Loss:0.082 Validation Loss:0.052092
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:26 Training Accuracy:0.659 Validation Accuracy:0.636
Epoch:26 Training Loss:0.081 Validation Loss:0.048670
Validation Loss decreased:0.050565 --> 0.048670 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:27 Training Accuracy:0.636 Validation Accuracy:0.703
Epoch:27 Training Loss:0.083 Validation Loss:0.047493
Validation Loss decreased:0.048670 --> 0.047493 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.36it/s]

Epochs:28 Training Accuracy:0.656 Validation Accuracy:0.641
Epoch:28 Training Loss:0.084 Validation Loss:0.048341
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:29 Training Accuracy:0.648 Validation Accuracy:0.677
Epoch:29 Training Loss:0.081 Validation Loss:0.055745
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:30 Training Accuracy:0.669 Validation Accuracy:0.690
Epoch:30 Training Loss:0.085 Validation Loss:0.050375
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.20it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:31 Training Accuracy:0.650 Validation Accuracy:0.641
Epoch:31 Training Loss:0.080 Validation Loss:0.051102
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:32 Training Accuracy:0.658 Validation Accuracy:0.649
Epoch:32 Training Loss:0.082 Validation Loss:0.049676
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:33 Training Accuracy:0.670 Validation Accuracy:0.674
Epoch:33 Training Loss:0.078 Validation Loss:0.052143
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:34 Training Accuracy:0.662 Validation Accuracy:0.664
Epoch:34 Training Loss:0.082 Validation Loss:0.053879
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 19.42it/s]

Epochs:35 Training Accuracy:0.638 Validation Accuracy:0.628
Epoch:35 Training Loss:0.082 Validation Loss:0.049055
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:36 Training Accuracy:0.651 Validation Accuracy:0.584
Epoch:36 Training Loss:0.081 Validation Loss:0.054070
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:37 Training Accuracy:0.661 Validation Accuracy:0.654
Epoch:37 Training Loss:0.086 Validation Loss:0.054913
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.45it/s]
100%|██████████| 3/3 [00:00<00:00, 21.32it/s]

Epochs:38 Training Accuracy:0.669 Validation Accuracy:0.677
Epoch:38 Training Loss:0.080 Validation Loss:0.056854
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.047492701560258865
Fold:2

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:1 Training Accuracy:0.487 Validation Accuracy:0.499
Epoch:1 Training Loss:0.971 Validation Loss:0.977985
Validation Loss decreased:inf --> 0.977985 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:2 Training Accuracy:0.428 Validation Accuracy:0.509
Epoch:2 Training Loss:0.707 Validation Loss:0.607806
Validation Loss decreased:0.977985 --> 0.607806 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:3 Training Accuracy:0.572 Validation Accuracy:0.625
Epoch:3 Training Loss:0.436 Validation Loss:0.369476
Validation Loss decreased:0.607806 --> 0.369476 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.88it/s]

Epochs:4 Training Accuracy:0.600 Validation Accuracy:0.625
Epoch:4 Training Loss:0.307 Validation Loss:0.310853
Validation Loss decreased:0.369476 --> 0.310853 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:5 Training Accuracy:0.616 Validation Accuracy:0.649
Epoch:5 Training Loss:0.261 Validation Loss:0.236090
Validation Loss decreased:0.310853 --> 0.236090 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 19.98it/s]

Epochs:6 Training Accuracy:0.632 Validation Accuracy:0.587
Epoch:6 Training Loss:0.177 Validation Loss:0.165175
Validation Loss decreased:0.236090 --> 0.165175 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:7 Training Accuracy:0.657 Validation Accuracy:0.630
Epoch:7 Training Loss:0.131 Validation Loss:0.089965
Validation Loss decreased:0.165175 --> 0.089965 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:8 Training Accuracy:0.658 Validation Accuracy:0.664
Epoch:8 Training Loss:0.103 Validation Loss:0.074872
Validation Loss decreased:0.089965 --> 0.074872 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:9 Training Accuracy:0.666 Validation Accuracy:0.656
Epoch:9 Training Loss:0.096 Validation Loss:0.066763
Validation Loss decreased:0.074872 --> 0.066763 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:10 Training Accuracy:0.639 Validation Accuracy:0.677
Epoch:10 Training Loss:0.090 Validation Loss:0.061765
Validation Loss decreased:0.066763 --> 0.061765 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:11 Training Accuracy:0.618 Validation Accuracy:0.607
Epoch:11 Training Loss:0.087 Validation Loss:0.058346
Validation Loss decreased:0.061765 --> 0.058346 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 17.84it/s]

Epochs:12 Training Accuracy:0.611 Validation Accuracy:0.672
Epoch:12 Training Loss:0.086 Validation Loss:0.059599
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:13 Training Accuracy:0.669 Validation Accuracy:0.610
Epoch:13 Training Loss:0.087 Validation Loss:0.084261
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:14 Training Accuracy:0.661 Validation Accuracy:0.664
Epoch:14 Training Loss:0.100 Validation Loss:0.080624
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:15 Training Accuracy:0.658 Validation Accuracy:0.605

Epoch:15 Training Loss:0.091 Validation Loss:0.063233

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.09it/s]

100%|██████████| 3/3 [00:00<00:00, 18.81it/s]

Epochs:16 Training Accuracy:0.644 Validation Accuracy:0.703

Epoch:16 Training Loss:0.091 Validation Loss:0.057630

Validation Loss decreased:0.058346 --> 0.057630 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]

100%|██████████| 3/3 [00:00<00:00, 21.01it/s]

Epochs:17 Training Accuracy:0.611 Validation Accuracy:0.623

Epoch:17 Training Loss:0.088 Validation Loss:0.063652

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:18 Training Accuracy:0.659 Validation Accuracy:0.615

Epoch:18 Training Loss:0.096 Validation Loss:0.079563

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]

100%|██████████| 3/3 [00:00<00:00, 19.59it/s]

Epochs:19 Training Accuracy:0.641 Validation Accuracy:0.633

Epoch:19 Training Loss:0.090 Validation Loss:0.076925

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:20 Training Accuracy:0.636 Validation Accuracy:0.721

Epoch:20 Training Loss:0.086 Validation Loss:0.055420

Validation Loss decreased:0.057630 --> 0.055420 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]

100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:21 Training Accuracy:0.640 Validation Accuracy:0.589

Epoch:21 Training Loss:0.086 Validation Loss:0.060970

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:22 Training Accuracy:0.627 Validation Accuracy:0.703

Epoch:22 Training Loss:0.086 Validation Loss:0.059742

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]

100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:23 Training Accuracy:0.667 Validation Accuracy:0.705

Epoch:23 Training Loss:0.082 Validation Loss:0.064991

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:24 Training Accuracy:0.649 Validation Accuracy:0.615

Epoch:24 Training Loss:0.085 Validation Loss:0.058259

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:25 Training Accuracy:0.650 Validation Accuracy:0.656

Epoch:25 Training Loss:0.083 Validation Loss:0.054721

Validation Loss decreased:0.055420 --> 0.054721 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.43it/s]

100%|██████████| 3/3 [00:00<00:00, 19.30it/s]

Epochs:26 Training Accuracy:0.659 Validation Accuracy:0.579

Epoch:26 Training Loss:0.081 Validation Loss:0.066728

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:27 Training Accuracy:0.625 Validation Accuracy:0.672

Epoch:27 Training Loss:0.085 Validation Loss:0.061081

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:28 Training Accuracy:0.654 Validation Accuracy:0.563

Epoch:28 Training Loss:0.087 Validation Loss:0.058314

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:29 Training Accuracy:0.670 Validation Accuracy:0.638

Epoch:29 Training Loss:0.084 Validation Loss:0.052580

Validation Loss decreased:0.054721 --> 0.052580 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:30 Training Accuracy:0.651 Validation Accuracy:0.636

Epoch:30 Training Loss:0.087 Validation Loss:0.061948

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:31 Training Accuracy:0.613 Validation Accuracy:0.700

Epoch:31 Training Loss:0.087 Validation Loss:0.068886

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 20.91it/s]

Epochs:32 Training Accuracy:0.618 Validation Accuracy:0.659

Epoch:32 Training Loss:0.085 Validation Loss:0.050659

Validation Loss decreased:0.052580 --> 0.050659 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.43it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:33 Training Accuracy:0.670 Validation Accuracy:0.659

Epoch:33 Training Loss:0.083 Validation Loss:0.054474

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:34 Training Accuracy:0.650 Validation Accuracy:0.703

Epoch:34 Training Loss:0.081 Validation Loss:0.056549

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.39it/s]

Epochs:35 Training Accuracy:0.611 Validation Accuracy:0.718

Epoch:35 Training Loss:0.078 Validation Loss:0.054541

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.26it/s]

100%|██████████| 3/3 [00:00<00:00, 19.11it/s]

Epochs:36 Training Accuracy:0.607 Validation Accuracy:0.630

Epoch:36 Training Loss:0.079 Validation Loss:0.054648

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]

100%|██████████| 3/3 [00:00<00:00, 21.01it/s]

Epochs:37 Training Accuracy:0.661 Validation Accuracy:0.618

Epoch:37 Training Loss:0.079 Validation Loss:0.058802

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:38 Training Accuracy:0.641 Validation Accuracy:0.742

Epoch:38 Training Loss:0.079 Validation Loss:0.052479

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:39 Training Accuracy:0.633 Validation Accuracy:0.685

Epoch:39 Training Loss:0.079 Validation Loss:0.071070

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.48it/s]

100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:40 Training Accuracy:0.651 Validation Accuracy:0.636

Epoch:40 Training Loss:0.083 Validation Loss:0.082298

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.48it/s]

Epochs:41 Training Accuracy:0.624 Validation Accuracy:0.687

Epoch:41 Training Loss:0.089 Validation Loss:0.064309

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]

100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:42 Training Accuracy:0.598 Validation Accuracy:0.612
Epoch:42 Training Loss:0.077 Validation Loss:0.048180
Validation Loss decreased:0.050659 --> 0.048180 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:43 Training Accuracy:0.607 Validation Accuracy:0.592
Epoch:43 Training Loss:0.079 Validation Loss:0.052010
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:44 Training Accuracy:0.651 Validation Accuracy:0.718
Epoch:44 Training Loss:0.078 Validation Loss:0.053937
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:45 Training Accuracy:0.643 Validation Accuracy:0.599
Epoch:45 Training Loss:0.076 Validation Loss:0.059530
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.37it/s]

Epochs:46 Training Accuracy:0.633 Validation Accuracy:0.579
Epoch:46 Training Loss:0.080 Validation Loss:0.074159
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.33it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:47 Training Accuracy:0.634 Validation Accuracy:0.599
Epoch:47 Training Loss:0.082 Validation Loss:0.055401
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:48 Training Accuracy:0.636 Validation Accuracy:0.705
Epoch:48 Training Loss:0.077 Validation Loss:0.054546
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:49 Training Accuracy:0.639 Validation Accuracy:0.556
Epoch:49 Training Loss:0.080 Validation Loss:0.066902
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:50 Training Accuracy:0.623 Validation Accuracy:0.708
Epoch:50 Training Loss:0.084 Validation Loss:0.056588
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:51 Training Accuracy:0.630 Validation Accuracy:0.654
Epoch:51 Training Loss:0.079 Validation Loss:0.048117
Validation Loss decreased:0.048180 --> 0.048117 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:52 Training Accuracy:0.651 Validation Accuracy:0.654
Epoch:52 Training Loss:0.077 Validation Loss:0.055075
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:53 Training Accuracy:0.638 Validation Accuracy:0.535
Epoch:53 Training Loss:0.079 Validation Loss:0.071742
count patience:2 of 10
100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:54 Training Accuracy:0.629 Validation Accuracy:0.659
Epoch:54 Training Loss:0.088 Validation Loss:0.049275
count patience:3 of 10
100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.84it/s]

Epochs:55 Training Accuracy:0.589 Validation Accuracy:0.649
Epoch:55 Training Loss:0.087 Validation Loss:0.051801
count patience:4 of 10
100%|██████████| 15/15 [00:01<00:00, 10.29it/s]
100%|██████████| 3/3 [00:00<00:00, 19.20it/s]

Epochs:56 Training Accuracy:0.651 Validation Accuracy:0.664
Epoch:56 Training Loss:0.082 Validation Loss:0.050516
count patience:5 of 10
100%|██████████| 15/15 [00:01<00:00, 10.45it/s]
100%|██████████| 3/3 [00:00<00:00, 20.94it/s]

Epochs:57 Training Accuracy:0.641 Validation Accuracy:0.672
Epoch:57 Training Loss:0.082 Validation Loss:0.051571
count patience:6 of 10
100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:58 Training Accuracy:0.663 Validation Accuracy:0.651
Epoch:58 Training Loss:0.078 Validation Loss:0.057278
count patience:7 of 10
100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.15it/s]

Epochs:59 Training Accuracy:0.649 Validation Accuracy:0.646
Epoch:59 Training Loss:0.078 Validation Loss:0.048545
count patience:8 of 10
100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:60 Training Accuracy:0.640 Validation Accuracy:0.618
Epoch:60 Training Loss:0.081 Validation Loss:0.057727
count patience:9 of 10
100%|██████████| 15/15 [00:01<00:00, 10.34it/s]
100%|██████████| 3/3 [00:00<00:00, 21.19it/s]

Epochs:61 Training Accuracy:0.613 Validation Accuracy:0.651
Epoch:61 Training Loss:0.080 Validation Loss:0.050574
count patience:10 of 10
100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:62 Training Accuracy:0.642 Validation Accuracy:0.589
Epoch:62 Training Loss:0.083 Validation Loss:0.059185
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.048117443919181824
Fold:3

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:1 Training Accuracy:0.496 Validation Accuracy:0.475
Epoch:1 Training Loss:0.978 Validation Loss:0.982434
Validation Loss decreased:inf --> 0.982434 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:2 Training Accuracy:0.467 Validation Accuracy:0.475
Epoch:2 Training Loss:0.736 Validation Loss:0.601933
Validation Loss decreased:0.982434 --> 0.601933 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:3 Training Accuracy:0.552 Validation Accuracy:0.638
Epoch:3 Training Loss:0.451 Validation Loss:0.360531
Validation Loss decreased:0.601933 --> 0.360531 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:4 Training Accuracy:0.624 Validation Accuracy:0.605
Epoch:4 Training Loss:0.328 Validation Loss:0.286804
Validation Loss decreased:0.360531 --> 0.286804 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:5 Training Accuracy:0.624 Validation Accuracy:0.630
Epoch:5 Training Loss:0.252 Validation Loss:0.221188
Validation Loss decreased:0.286804 --> 0.221188 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:6 Training Accuracy:0.603 Validation Accuracy:0.633
Epoch:6 Training Loss:0.177 Validation Loss:0.199054
Validation Loss decreased:0.221188 --> 0.199054 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:7 Training Accuracy:0.650 Validation Accuracy:0.605
Epoch:7 Training Loss:0.138 Validation Loss:0.124254
Validation Loss decreased:0.199054 --> 0.124254 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.84it/s]

Epochs:8 Training Accuracy:0.617 Validation Accuracy:0.693
Epoch:8 Training Loss:0.105 Validation Loss:0.063768
Validation Loss decreased:0.124254 --> 0.063768 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:9 Training Accuracy:0.628 Validation Accuracy:0.618
Epoch:9 Training Loss:0.096 Validation Loss:0.081834
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.91it/s]

Epochs:10 Training Accuracy:0.622 Validation Accuracy:0.587
Epoch:10 Training Loss:0.098 Validation Loss:0.061738
Validation Loss decreased:0.063768 --> 0.061738 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:11 Training Accuracy:0.654 Validation Accuracy:0.620
Epoch:11 Training Loss:0.093 Validation Loss:0.077597
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.35it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:12 Training Accuracy:0.638 Validation Accuracy:0.687
Epoch:12 Training Loss:0.096 Validation Loss:0.079928
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 19.39it/s]

Epochs:13 Training Accuracy:0.662 Validation Accuracy:0.643
Epoch:13 Training Loss:0.091 Validation Loss:0.058866
Validation Loss decreased:0.061738 --> 0.058866 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:14 Training Accuracy:0.668 Validation Accuracy:0.664
Epoch:14 Training Loss:0.090 Validation Loss:0.062767
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:15 Training Accuracy:0.624 Validation Accuracy:0.568
Epoch:15 Training Loss:0.095 Validation Loss:0.080050
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:16 Training Accuracy:0.638 Validation Accuracy:0.667
Epoch:16 Training Loss:0.090 Validation Loss:0.070915
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:17 Training Accuracy:0.660 Validation Accuracy:0.713
Epoch:17 Training Loss:0.087 Validation Loss:0.058288
Validation Loss decreased:0.058866 --> 0.058288 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:18 Training Accuracy:0.652 Validation Accuracy:0.669
Epoch:18 Training Loss:0.090 Validation Loss:0.062152
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.29it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:19 Training Accuracy:0.618 Validation Accuracy:0.584
Epoch:19 Training Loss:0.087 Validation Loss:0.057249
Validation Loss decreased:0.058288 --> 0.057249 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:20 Training Accuracy:0.669 Validation Accuracy:0.641
Epoch:20 Training Loss:0.097 Validation Loss:0.067160
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:21 Training Accuracy:0.656 Validation Accuracy:0.537
Epoch:21 Training Loss:0.087 Validation Loss:0.063414
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:22 Training Accuracy:0.646 Validation Accuracy:0.646
Epoch:22 Training Loss:0.083 Validation Loss:0.055133
Validation Loss decreased:0.057249 --> 0.055133 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.88it/s]

Epochs:23 Training Accuracy:0.617 Validation Accuracy:0.656
Epoch:23 Training Loss:0.086 Validation Loss:0.055863
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:24 Training Accuracy:0.630 Validation Accuracy:0.713
Epoch:24 Training Loss:0.082 Validation Loss:0.060683
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.37it/s]

Epochs:25 Training Accuracy:0.653 Validation Accuracy:0.556
Epoch:25 Training Loss:0.087 Validation Loss:0.071871
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.23it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:26 Training Accuracy:0.630 Validation Accuracy:0.695
Epoch:26 Training Loss:0.088 Validation Loss:0.054377
Validation Loss decreased:0.055133 --> 0.054377 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:27 Training Accuracy:0.621 Validation Accuracy:0.651
Epoch:27 Training Loss:0.083 Validation Loss:0.059648
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:28 Training Accuracy:0.652 Validation Accuracy:0.623
Epoch:28 Training Loss:0.084 Validation Loss:0.052923
Validation Loss decreased:0.054377 --> 0.052923 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:29 Training Accuracy:0.624 Validation Accuracy:0.669
Epoch:29 Training Loss:0.080 Validation Loss:0.055322
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:30 Training Accuracy:0.648 Validation Accuracy:0.724
Epoch:30 Training Loss:0.083 Validation Loss:0.054128
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:31 Training Accuracy:0.667 Validation Accuracy:0.682
Epoch:31 Training Loss:0.086 Validation Loss:0.061760
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.60it/s]
100%|██████████| 3/3 [00:00<00:00, 19.22it/s]

Epochs:32 Training Accuracy:0.645 Validation Accuracy:0.698
Epoch:32 Training Loss:0.086 Validation Loss:0.059419
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 9.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:33 Training Accuracy:0.661 Validation Accuracy:0.664
Epoch:33 Training Loss:0.084 Validation Loss:0.061284
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:34 Training Accuracy:0.655 Validation Accuracy:0.563
Epoch:34 Training Loss:0.082 Validation Loss:0.067108
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.08it/s]

Epochs:35 Training Accuracy:0.666 Validation Accuracy:0.620
Epoch:35 Training Loss:0.079 Validation Loss:0.053084
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:36 Training Accuracy:0.663 Validation Accuracy:0.623
Epoch:36 Training Loss:0.081 Validation Loss:0.060926
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:37 Training Accuracy:0.596 Validation Accuracy:0.711
Epoch:37 Training Loss:0.087 Validation Loss:0.083264
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:38 Training Accuracy:0.663 Validation Accuracy:0.685
Epoch:38 Training Loss:0.091 Validation Loss:0.062071
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 17.10it/s]

Epochs:39 Training Accuracy:0.630 Validation Accuracy:0.643
Epoch:39 Training Loss:0.082 Validation Loss:0.052845
Validation Loss decreased:0.052923 --> 0.052845 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:40 Training Accuracy:0.627 Validation Accuracy:0.638
Epoch:40 Training Loss:0.082 Validation Loss:0.054750
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.45it/s]

Epochs:41 Training Accuracy:0.660 Validation Accuracy:0.618
Epoch:41 Training Loss:0.084 Validation Loss:0.048456
Validation Loss decreased:0.052845 --> 0.048456 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.89it/s]

Epochs:42 Training Accuracy:0.655 Validation Accuracy:0.643
Epoch:42 Training Loss:0.078 Validation Loss:0.059677
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:43 Training Accuracy:0.684 Validation Accuracy:0.695
Epoch:43 Training Loss:0.081 Validation Loss:0.056394
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:44 Training Accuracy:0.665 Validation Accuracy:0.623
Epoch:44 Training Loss:0.080 Validation Loss:0.057208
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:45 Training Accuracy:0.614 Validation Accuracy:0.680
Epoch:45 Training Loss:0.080 Validation Loss:0.054431
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.45it/s]
100%|██████████| 3/3 [00:00<00:00, 19.75it/s]

Epochs:46 Training Accuracy:0.663 Validation Accuracy:0.628
Epoch:46 Training Loss:0.081 Validation Loss:0.052746
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:47 Training Accuracy:0.658 Validation Accuracy:0.667
Epoch:47 Training Loss:0.084 Validation Loss:0.051836
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:48 Training Accuracy:0.630 Validation Accuracy:0.677
Epoch:48 Training Loss:0.083 Validation Loss:0.057969
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:49 Training Accuracy:0.634 Validation Accuracy:0.620
Epoch:49 Training Loss:0.077 Validation Loss:0.049332
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:50 Training Accuracy:0.626 Validation Accuracy:0.594
Epoch:50 Training Loss:0.081 Validation Loss:0.052192
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:51 Training Accuracy:0.671 Validation Accuracy:0.656
Epoch:51 Training Loss:0.082 Validation Loss:0.050816
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:52 Training Accuracy:0.649 Validation Accuracy:0.659
Epoch:52 Training Loss:0.081 Validation Loss:0.048310
Validation Loss decreased:0.048456 --> 0.048310 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.32it/s]
100%|██████████| 3/3 [00:00<00:00, 11.13it/s]

Epochs:53 Training Accuracy:0.626 Validation Accuracy:0.584
Epoch:53 Training Loss:0.081 Validation Loss:0.054269
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 9.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:54 Training Accuracy:0.631 Validation Accuracy:0.695
Epoch:54 Training Loss:0.075 Validation Loss:0.052654
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:55 Training Accuracy:0.653 Validation Accuracy:0.574
Epoch:55 Training Loss:0.077 Validation Loss:0.053405
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:56 Training Accuracy:0.664 Validation Accuracy:0.661
Epoch:56 Training Loss:0.079 Validation Loss:0.055055
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.84it/s]

Epochs:57 Training Accuracy:0.642 Validation Accuracy:0.649
Epoch:57 Training Loss:0.076 Validation Loss:0.053080
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:58 Training Accuracy:0.648 Validation Accuracy:0.731
Epoch:58 Training Loss:0.077 Validation Loss:0.054663
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:59 Training Accuracy:0.632 Validation Accuracy:0.682
Epoch:59 Training Loss:0.079 Validation Loss:0.057461
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.44it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:60 Training Accuracy:0.637 Validation Accuracy:0.553
Epoch:60 Training Loss:0.078 Validation Loss:0.051222
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:61 Training Accuracy:0.634 Validation Accuracy:0.703
Epoch:61 Training Loss:0.085 Validation Loss:0.068239
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:62 Training Accuracy:0.646 Validation Accuracy:0.739
Epoch:62 Training Loss:0.083 Validation Loss:0.055213
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:63 Training Accuracy:0.632 Validation Accuracy:0.581
Epoch:63 Training Loss:0.078 Validation Loss:0.049357
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.048310164362192154
Fold:4

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:1 Training Accuracy:0.495 Validation Accuracy:0.496
Epoch:1 Training Loss:0.977 Validation Loss:0.981931
Validation Loss decreased:inf --> 0.981931 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:2 Training Accuracy:0.477 Validation Accuracy:0.486
Epoch:2 Training Loss:0.735 Validation Loss:0.622580
Validation Loss decreased:0.981931 --> 0.622580 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:3 Training Accuracy:0.534 Validation Accuracy:0.620
Epoch:3 Training Loss:0.462 Validation Loss:0.387938
Validation Loss decreased:0.622580 --> 0.387938 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:4 Training Accuracy:0.609 Validation Accuracy:0.589
Epoch:4 Training Loss:0.335 Validation Loss:0.287150
Validation Loss decreased:0.387938 --> 0.287150 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:5 Training Accuracy:0.614 Validation Accuracy:0.636
Epoch:5 Training Loss:0.246 Validation Loss:0.224130
Validation Loss decreased:0.287150 --> 0.224130 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:6 Training Accuracy:0.618 Validation Accuracy:0.651

Epoch:6 Training Loss:0.181 Validation Loss:0.166191

Validation Loss decreased:0.224130 --> 0.166191 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]

100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:7 Training Accuracy:0.639 Validation Accuracy:0.605

Epoch:7 Training Loss:0.134 Validation Loss:0.100236

Validation Loss decreased:0.166191 --> 0.100236 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.21it/s]

Epochs:8 Training Accuracy:0.643 Validation Accuracy:0.625

Epoch:8 Training Loss:0.102 Validation Loss:0.085093

Validation Loss decreased:0.100236 --> 0.085093 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]

100%|██████████| 3/3 [00:00<00:00, 19.07it/s]

Epochs:9 Training Accuracy:0.626 Validation Accuracy:0.592

Epoch:9 Training Loss:0.095 Validation Loss:0.066758

Validation Loss decreased:0.085093 --> 0.066758 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.98it/s]

100%|██████████| 3/3 [00:00<00:00, 21.28it/s]

Epochs:10 Training Accuracy:0.655 Validation Accuracy:0.698

Epoch:10 Training Loss:0.093 Validation Loss:0.062373

Validation Loss decreased:0.066758 --> 0.062373 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.56it/s]

100%|██████████| 3/3 [00:00<00:00, 21.22it/s]

Epochs:11 Training Accuracy:0.668 Validation Accuracy:0.612

Epoch:11 Training Loss:0.090 Validation Loss:0.063430

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:12 Training Accuracy:0.647 Validation Accuracy:0.610

Epoch:12 Training Loss:0.090 Validation Loss:0.062613

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:13 Training Accuracy:0.623 Validation Accuracy:0.669

Epoch:13 Training Loss:0.091 Validation Loss:0.064019

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:14 Training Accuracy:0.619 Validation Accuracy:0.742

Epoch:14 Training Loss:0.092 Validation Loss:0.061198

Validation Loss decreased:0.062373 --> 0.061198 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:15 Training Accuracy:0.674 Validation Accuracy:0.625

Epoch:15 Training Loss:0.092 Validation Loss:0.066785

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:16 Training Accuracy:0.639 Validation Accuracy:0.571

Epoch:16 Training Loss:0.086 Validation Loss:0.055886

Validation Loss decreased:0.061198 --> 0.055886 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.27it/s]

100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:17 Training Accuracy:0.628 Validation Accuracy:0.700

Epoch:17 Training Loss:0.088 Validation Loss:0.059045

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]

100%|██████████| 3/3 [00:00<00:00, 20.82it/s]

Epochs:18 Training Accuracy:0.586 Validation Accuracy:0.630

Epoch:18 Training Loss:0.091 Validation Loss:0.061050

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:19 Training Accuracy:0.648 Validation Accuracy:0.705

Epoch:19 Training Loss:0.087 Validation Loss:0.061225

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:20 Training Accuracy:0.657 Validation Accuracy:0.661

Epoch:20 Training Loss:0.086 Validation Loss:0.058326

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:21 Training Accuracy:0.617 Validation Accuracy:0.661

Epoch:21 Training Loss:0.085 Validation Loss:0.066894

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 20.97it/s]

Epochs:22 Training Accuracy:0.663 Validation Accuracy:0.537

Epoch:22 Training Loss:0.087 Validation Loss:0.061032

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:23 Training Accuracy:0.637 Validation Accuracy:0.674

Epoch:23 Training Loss:0.086 Validation Loss:0.053720

Validation Loss decreased:0.055886 --> 0.053720 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]

100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:24 Training Accuracy:0.638 Validation Accuracy:0.587
Epoch:24 Training Loss:0.086 Validation Loss:0.058656
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:25 Training Accuracy:0.659 Validation Accuracy:0.674
Epoch:25 Training Loss:0.086 Validation Loss:0.058541
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:26 Training Accuracy:0.629 Validation Accuracy:0.605
Epoch:26 Training Loss:0.085 Validation Loss:0.056637
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:27 Training Accuracy:0.631 Validation Accuracy:0.654
Epoch:27 Training Loss:0.087 Validation Loss:0.079855
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:28 Training Accuracy:0.655 Validation Accuracy:0.698
Epoch:28 Training Loss:0.087 Validation Loss:0.062330
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 19.01it/s]

Epochs:29 Training Accuracy:0.651 Validation Accuracy:0.721
Epoch:29 Training Loss:0.083 Validation Loss:0.060342
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.16it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:30 Training Accuracy:0.632 Validation Accuracy:0.669
Epoch:30 Training Loss:0.088 Validation Loss:0.058016
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:31 Training Accuracy:0.629 Validation Accuracy:0.628
Epoch:31 Training Loss:0.088 Validation Loss:0.057019
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:32 Training Accuracy:0.632 Validation Accuracy:0.656
Epoch:32 Training Loss:0.082 Validation Loss:0.055178
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:33 Training Accuracy:0.632 Validation Accuracy:0.646
Epoch:33 Training Loss:0.082 Validation Loss:0.057425
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:34 Training Accuracy:0.663 Validation Accuracy:0.693
Epoch:34 Training Loss:0.082 Validation Loss:0.063862
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.053719859570264816
Fold:5

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:1 Training Accuracy:0.496 Validation Accuracy:0.491
Epoch:1 Training Loss:0.977 Validation Loss:0.982956
Validation Loss decreased:inf --> 0.982956 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.94it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:2 Training Accuracy:0.493 Validation Accuracy:0.483
Epoch:2 Training Loss:0.736 Validation Loss:0.599091
Validation Loss decreased:0.982956 --> 0.599091 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 17.33it/s]

Epochs:3 Training Accuracy:0.548 Validation Accuracy:0.680
Epoch:3 Training Loss:0.467 Validation Loss:0.370455
Validation Loss decreased:0.599091 --> 0.370455 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.08it/s]

Epochs:4 Training Accuracy:0.606 Validation Accuracy:0.610
Epoch:4 Training Loss:0.333 Validation Loss:0.271582
Validation Loss decreased:0.370455 --> 0.271582 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:5 Training Accuracy:0.621 Validation Accuracy:0.618
Epoch:5 Training Loss:0.242 Validation Loss:0.202191
Validation Loss decreased:0.271582 --> 0.202191 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:6 Training Accuracy:0.630 Validation Accuracy:0.736
Epoch:6 Training Loss:0.169 Validation Loss:0.160863
Validation Loss decreased:0.202191 --> 0.160863 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:7 Training Accuracy:0.645 Validation Accuracy:0.649
Epoch:7 Training Loss:0.119 Validation Loss:0.087992
Validation Loss decreased:0.160863 --> 0.087992 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:8 Training Accuracy:0.653 Validation Accuracy:0.718
Epoch:8 Training Loss:0.095 Validation Loss:0.070869
Validation Loss decreased:0.087992 --> 0.070869 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 19.98it/s]

Epochs:9 Training Accuracy:0.625 Validation Accuracy:0.618
Epoch:9 Training Loss:0.092 Validation Loss:0.064323
Validation Loss decreased:0.070869 --> 0.064323 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.35it/s]
100%|██████████| 3/3 [00:00<00:00, 20.92it/s]

Epochs:10 Training Accuracy:0.652 Validation Accuracy:0.677
Epoch:10 Training Loss:0.088 Validation Loss:0.062948
Validation Loss decreased:0.064323 --> 0.062948 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:11 Training Accuracy:0.653 Validation Accuracy:0.669
Epoch:11 Training Loss:0.090 Validation Loss:0.062738
Validation Loss decreased:0.062948 --> 0.062738 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:12 Training Accuracy:0.628 Validation Accuracy:0.646
Epoch:12 Training Loss:0.090 Validation Loss:0.068128
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:13 Training Accuracy:0.619 Validation Accuracy:0.690
Epoch:13 Training Loss:0.089 Validation Loss:0.061577
Validation Loss decreased:0.062738 --> 0.061577 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.16it/s]
100%|██████████| 3/3 [00:00<00:00, 19.36it/s]

Epochs:14 Training Accuracy:0.612 Validation Accuracy:0.664
Epoch:14 Training Loss:0.093 Validation Loss:0.078046
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:15 Training Accuracy:0.649 Validation Accuracy:0.674
Epoch:15 Training Loss:0.088 Validation Loss:0.060080
Validation Loss decreased:0.061577 --> 0.060080 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:16 Training Accuracy:0.658 Validation Accuracy:0.656
Epoch:16 Training Loss:0.086 Validation Loss:0.060532
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:17 Training Accuracy:0.652 Validation Accuracy:0.667
Epoch:17 Training Loss:0.086 Validation Loss:0.072345
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:18 Training Accuracy:0.626 Validation Accuracy:0.641
Epoch:18 Training Loss:0.091 Validation Loss:0.061685
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:19 Training Accuracy:0.640 Validation Accuracy:0.628
Epoch:19 Training Loss:0.085 Validation Loss:0.058062
Validation Loss decreased:0.060080 --> 0.058062 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:20 Training Accuracy:0.611 Validation Accuracy:0.669
Epoch:20 Training Loss:0.085 Validation Loss:0.057768
Validation Loss decreased:0.058062 --> 0.057768 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:21 Training Accuracy:0.661 Validation Accuracy:0.721
Epoch:21 Training Loss:0.083 Validation Loss:0.067681
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:22 Training Accuracy:0.674 Validation Accuracy:0.672
Epoch:22 Training Loss:0.087 Validation Loss:0.056377
Validation Loss decreased:0.057768 --> 0.056377 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]
100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:23 Training Accuracy:0.658 Validation Accuracy:0.625
Epoch:23 Training Loss:0.082 Validation Loss:0.057890
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:24 Training Accuracy:0.669 Validation Accuracy:0.698
Epoch:24 Training Loss:0.085 Validation Loss:0.066805
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:25 Training Accuracy:0.655 Validation Accuracy:0.618
Epoch:25 Training Loss:0.086 Validation Loss:0.056756
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:26 Training Accuracy:0.652 Validation Accuracy:0.615
Epoch:26 Training Loss:0.085 Validation Loss:0.057533
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:27 Training Accuracy:0.609 Validation Accuracy:0.618
Epoch:27 Training Loss:0.083 Validation Loss:0.059201
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:28 Training Accuracy:0.624 Validation Accuracy:0.630
Epoch:28 Training Loss:0.079 Validation Loss:0.066772
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 17.49it/s]

Epochs:29 Training Accuracy:0.648 Validation Accuracy:0.633
Epoch:29 Training Loss:0.084 Validation Loss:0.055180
Validation Loss decreased:0.056377 --> 0.055180 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.55it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:30 Training Accuracy:0.681 Validation Accuracy:0.661
Epoch:30 Training Loss:0.079 Validation Loss:0.059374
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:31 Training Accuracy:0.648 Validation Accuracy:0.656
Epoch:31 Training Loss:0.090 Validation Loss:0.074785
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:32 Training Accuracy:0.634 Validation Accuracy:0.607
Epoch:32 Training Loss:0.080 Validation Loss:0.056489
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:33 Training Accuracy:0.651 Validation Accuracy:0.739
Epoch:33 Training Loss:0.083 Validation Loss:0.051582
Validation Loss decreased:0.055180 --> 0.051582 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.97it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:34 Training Accuracy:0.626 Validation Accuracy:0.661
Epoch:34 Training Loss:0.083 Validation Loss:0.056752
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:35 Training Accuracy:0.621 Validation Accuracy:0.602
Epoch:35 Training Loss:0.080 Validation Loss:0.058847
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.45it/s]
100%|██████████| 3/3 [00:00<00:00, 19.72it/s]

Epochs:36 Training Accuracy:0.638 Validation Accuracy:0.695
Epoch:36 Training Loss:0.082 Validation Loss:0.050080
Validation Loss decreased:0.051582 --> 0.050080 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:37 Training Accuracy:0.666 Validation Accuracy:0.685
Epoch:37 Training Loss:0.077 Validation Loss:0.057792
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:38 Training Accuracy:0.635 Validation Accuracy:0.607
Epoch:38 Training Loss:0.078 Validation Loss:0.059766
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:39 Training Accuracy:0.675 Validation Accuracy:0.687
Epoch:39 Training Loss:0.083 Validation Loss:0.059754
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:40 Training Accuracy:0.621 Validation Accuracy:0.661
Epoch:40 Training Loss:0.079 Validation Loss:0.057552
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:41 Training Accuracy:0.659 Validation Accuracy:0.602
Epoch:41 Training Loss:0.082 Validation Loss:0.052204
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:42 Training Accuracy:0.638 Validation Accuracy:0.690
Epoch:42 Training Loss:0.082 Validation Loss:0.056415
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.34it/s]
100%|██████████| 3/3 [00:00<00:00, 21.42it/s]

Epochs:43 Training Accuracy:0.633 Validation Accuracy:0.618
Epoch:43 Training Loss:0.084 Validation Loss:0.063500
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:44 Training Accuracy:0.647 Validation Accuracy:0.568
Epoch:44 Training Loss:0.085 Validation Loss:0.054192
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.17it/s]

Epochs:45 Training Accuracy:0.653 Validation Accuracy:0.693
Epoch:45 Training Loss:0.076 Validation Loss:0.056410
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:46 Training Accuracy:0.634 Validation Accuracy:0.636
Epoch:46 Training Loss:0.076 Validation Loss:0.052434
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:47 Training Accuracy:0.625 Validation Accuracy:0.659
Epoch:47 Training Loss:0.076 Validation Loss:0.054302
count patience:11 of 10

Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.05008033290505409

-----NASDAQ-----

Fold:1

100%|██████████| 15/15 [00:01<00:00, 10.93it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:1 Training Accuracy:0.504 Validation Accuracy:0.506
Epoch:1 Training Loss:0.997 Validation Loss:0.998607
Validation Loss decreased:inf --> 0.998607 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:2 Training Accuracy:0.502 Validation Accuracy:0.509
Epoch:2 Training Loss:0.963 Validation Loss:0.945515
Validation Loss decreased:0.998607 --> 0.945515 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.54it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:3 Training Accuracy:0.486 Validation Accuracy:0.457
Epoch:3 Training Loss:0.821 Validation Loss:0.746735
Validation Loss decreased:0.945515 --> 0.746735 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.96it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:4 Training Accuracy:0.472 Validation Accuracy:0.496
Epoch:4 Training Loss:0.713 Validation Loss:0.669494
Validation Loss decreased:0.746735 --> 0.669494 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.95it/s]

Epochs:5 Training Accuracy:0.499 Validation Accuracy:0.568

Epoch:5 Training Loss:0.596 Validation Loss:0.530212

Validation Loss decreased:0.669494 --> 0.530212 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]

100%|██████████| 3/3 [00:00<00:00, 18.56it/s]

Epochs:6 Training Accuracy:0.530 Validation Accuracy:0.674

Epoch:6 Training Loss:0.397 Validation Loss:0.322413

Validation Loss decreased:0.530212 --> 0.322413 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]

100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:7 Training Accuracy:0.569 Validation Accuracy:0.553

Epoch:7 Training Loss:0.335 Validation Loss:0.283533

Validation Loss decreased:0.322413 --> 0.283533 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]

100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:8 Training Accuracy:0.571 Validation Accuracy:0.643

Epoch:8 Training Loss:0.303 Validation Loss:0.495343

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]

100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:9 Training Accuracy:0.599 Validation Accuracy:0.628

Epoch:9 Training Loss:0.264 Validation Loss:0.514217

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]

100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:10 Training Accuracy:0.617 Validation Accuracy:0.649

Epoch:10 Training Loss:0.227 Validation Loss:0.178164

Validation Loss decreased:0.283533 --> 0.178164 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:11 Training Accuracy:0.603 Validation Accuracy:0.638

Epoch:11 Training Loss:0.200 Validation Loss:0.455770

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]

100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:12 Training Accuracy:0.651 Validation Accuracy:0.680

Epoch:12 Training Loss:0.170 Validation Loss:0.442019

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:13 Training Accuracy:0.670 Validation Accuracy:0.641

Epoch:13 Training Loss:0.153 Validation Loss:0.111364

Validation Loss decreased:0.178164 --> 0.111364 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.29it/s]

Epochs:14 Training Accuracy:0.693 Validation Accuracy:0.680
Epoch:14 Training Loss:0.139 Validation Loss:0.420694
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:15 Training Accuracy:0.642 Validation Accuracy:0.680
Epoch:15 Training Loss:0.116 Validation Loss:0.395118
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:16 Training Accuracy:0.680 Validation Accuracy:0.543
Epoch:16 Training Loss:0.107 Validation Loss:0.396470
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:17 Training Accuracy:0.660 Validation Accuracy:0.646
Epoch:17 Training Loss:0.100 Validation Loss:0.399706
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:18 Training Accuracy:0.669 Validation Accuracy:0.589
Epoch:18 Training Loss:0.098 Validation Loss:0.373474
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:19 Training Accuracy:0.605 Validation Accuracy:0.682
Epoch:19 Training Loss:0.101 Validation Loss:0.051175
Validation Loss decreased:0.111364 --> 0.051175 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:20 Training Accuracy:0.633 Validation Accuracy:0.656
Epoch:20 Training Loss:0.095 Validation Loss:0.366677
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:21 Training Accuracy:0.654 Validation Accuracy:0.693
Epoch:21 Training Loss:0.089 Validation Loss:0.063907
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:22 Training Accuracy:0.662 Validation Accuracy:0.705
Epoch:22 Training Loss:0.088 Validation Loss:0.060920
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.43it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:23 Training Accuracy:0.650 Validation Accuracy:0.729

Epoch:23 Training Loss:0.091 Validation Loss:0.371500

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:24 Training Accuracy:0.670 Validation Accuracy:0.685

Epoch:24 Training Loss:0.088 Validation Loss:0.375348

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:25 Training Accuracy:0.618 Validation Accuracy:0.705

Epoch:25 Training Loss:0.091 Validation Loss:0.363859

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]

100%|██████████| 3/3 [00:00<00:00, 19.39it/s]

Epochs:26 Training Accuracy:0.667 Validation Accuracy:0.703

Epoch:26 Training Loss:0.096 Validation Loss:0.373275

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]

100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:27 Training Accuracy:0.687 Validation Accuracy:0.680

Epoch:27 Training Loss:0.089 Validation Loss:0.379588

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]

100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:28 Training Accuracy:0.673 Validation Accuracy:0.623

Epoch:28 Training Loss:0.082 Validation Loss:0.390352

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:29 Training Accuracy:0.673 Validation Accuracy:0.597

Epoch:29 Training Loss:0.087 Validation Loss:0.384813

count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.35it/s]

100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:30 Training Accuracy:0.612 Validation Accuracy:0.698

Epoch:30 Training Loss:0.088 Validation Loss:0.384920

count patience:11 of 10

Meet Early Stopper so End Training...

And best Valid MAPE Loss:0.051175449043512344

Fold:2

100%|██████████| 15/15 [00:01<00:00, 10.95it/s]

100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:1 Training Accuracy:0.513 Validation Accuracy:0.504

Epoch:1 Training Loss:0.996 Validation Loss:0.998028

Validation Loss decreased:inf --> 0.998028 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:2 Training Accuracy:0.506 Validation Accuracy:0.494
Epoch:2 Training Loss:0.952 Validation Loss:0.934750
Validation Loss decreased:0.998028 --> 0.934750 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:3 Training Accuracy:0.500 Validation Accuracy:0.429
Epoch:3 Training Loss:0.798 Validation Loss:0.745162
Validation Loss decreased:0.934750 --> 0.745162 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:4 Training Accuracy:0.498 Validation Accuracy:0.517
Epoch:4 Training Loss:0.694 Validation Loss:0.670366
Validation Loss decreased:0.745162 --> 0.670366 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:5 Training Accuracy:0.493 Validation Accuracy:0.525
Epoch:5 Training Loss:0.554 Validation Loss:0.524523
Validation Loss decreased:0.670366 --> 0.524523 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 18.90it/s]

Epochs:6 Training Accuracy:0.563 Validation Accuracy:0.594
Epoch:6 Training Loss:0.379 Validation Loss:0.333664
Validation Loss decreased:0.524523 --> 0.333664 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 20.96it/s]

Epochs:7 Training Accuracy:0.558 Validation Accuracy:0.610
Epoch:7 Training Loss:0.323 Validation Loss:0.301623
Validation Loss decreased:0.333664 --> 0.301623 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:8 Training Accuracy:0.571 Validation Accuracy:0.584
Epoch:8 Training Loss:0.283 Validation Loss:0.304433
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:9 Training Accuracy:0.599 Validation Accuracy:0.576
Epoch:9 Training Loss:0.267 Validation Loss:0.237436
Validation Loss decreased:0.301623 --> 0.237436 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:10 Training Accuracy:0.614 Validation Accuracy:0.592
Epoch:10 Training Loss:0.229 Validation Loss:0.198312
Validation Loss decreased:0.237436 --> 0.198312 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:11 Training Accuracy:0.619 Validation Accuracy:0.641
Epoch:11 Training Loss:0.200 Validation Loss:0.167852
Validation Loss decreased:0.198312 --> 0.167852 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:12 Training Accuracy:0.641 Validation Accuracy:0.672
Epoch:12 Training Loss:0.167 Validation Loss:0.145279
Validation Loss decreased:0.167852 --> 0.145279 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 21.11it/s]

Epochs:13 Training Accuracy:0.668 Validation Accuracy:0.610
Epoch:13 Training Loss:0.143 Validation Loss:0.113031
Validation Loss decreased:0.145279 --> 0.113031 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:14 Training Accuracy:0.664 Validation Accuracy:0.667
Epoch:14 Training Loss:0.127 Validation Loss:0.098851
Validation Loss decreased:0.113031 --> 0.098851 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:15 Training Accuracy:0.673 Validation Accuracy:0.654
Epoch:15 Training Loss:0.124 Validation Loss:0.077533
Validation Loss decreased:0.098851 --> 0.077533 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.41it/s]

Epochs:16 Training Accuracy:0.654 Validation Accuracy:0.589
Epoch:16 Training Loss:0.101 Validation Loss:0.059888
Validation Loss decreased:0.077533 --> 0.059888 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.58it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:17 Training Accuracy:0.663 Validation Accuracy:0.607
Epoch:17 Training Loss:0.094 Validation Loss:0.053349
Validation Loss decreased:0.059888 --> 0.053349 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:18 Training Accuracy:0.665 Validation Accuracy:0.620
Epoch:18 Training Loss:0.100 Validation Loss:0.057109
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.29it/s]
100%|██████████| 3/3 [00:00<00:00, 21.31it/s]

Epochs:19 Training Accuracy:0.657 Validation Accuracy:0.711
Epoch:19 Training Loss:0.087 Validation Loss:0.062208
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:20 Training Accuracy:0.636 Validation Accuracy:0.700
Epoch:20 Training Loss:0.096 Validation Loss:0.057502
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:21 Training Accuracy:0.666 Validation Accuracy:0.669
Epoch:21 Training Loss:0.094 Validation Loss:0.112332
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:22 Training Accuracy:0.650 Validation Accuracy:0.726
Epoch:22 Training Loss:0.112 Validation Loss:0.083572
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:23 Training Accuracy:0.652 Validation Accuracy:0.636
Epoch:23 Training Loss:0.094 Validation Loss:0.056546
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:24 Training Accuracy:0.626 Validation Accuracy:0.739
Epoch:24 Training Loss:0.083 Validation Loss:0.048196
Validation Loss decreased:0.053349 --> 0.048196 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:25 Training Accuracy:0.670 Validation Accuracy:0.685
Epoch:25 Training Loss:0.082 Validation Loss:0.042846
Validation Loss decreased:0.048196 --> 0.042846 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.16it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:26 Training Accuracy:0.691 Validation Accuracy:0.628
Epoch:26 Training Loss:0.085 Validation Loss:0.051254
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.35it/s]

Epochs:27 Training Accuracy:0.663 Validation Accuracy:0.574
Epoch:27 Training Loss:0.087 Validation Loss:0.046305
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:28 Training Accuracy:0.632 Validation Accuracy:0.703
Epoch:28 Training Loss:0.084 Validation Loss:0.048143
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:29 Training Accuracy:0.645 Validation Accuracy:0.643
Epoch:29 Training Loss:0.085 Validation Loss:0.053941
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:30 Training Accuracy:0.642 Validation Accuracy:0.664
Epoch:30 Training Loss:0.091 Validation Loss:0.047536
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:31 Training Accuracy:0.663 Validation Accuracy:0.700
Epoch:31 Training Loss:0.081 Validation Loss:0.048826
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:32 Training Accuracy:0.686 Validation Accuracy:0.747
Epoch:32 Training Loss:0.085 Validation Loss:0.054379
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.31it/s]
100%|██████████| 3/3 [00:00<00:00, 20.81it/s]

Epochs:33 Training Accuracy:0.639 Validation Accuracy:0.633
Epoch:33 Training Loss:0.096 Validation Loss:0.057065
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 18.02it/s]

Epochs:34 Training Accuracy:0.640 Validation Accuracy:0.602
Epoch:34 Training Loss:0.093 Validation Loss:0.050176
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:35 Training Accuracy:0.660 Validation Accuracy:0.698
Epoch:35 Training Loss:0.083 Validation Loss:0.053414
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.45it/s]

Epochs:36 Training Accuracy:0.678 Validation Accuracy:0.680
Epoch:36 Training Loss:0.089 Validation Loss:0.041418
Validation Loss decreased:0.042846 --> 0.041418 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:37 Training Accuracy:0.637 Validation Accuracy:0.755
Epoch:37 Training Loss:0.092 Validation Loss:0.044017
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:38 Training Accuracy:0.661 Validation Accuracy:0.654
Epoch:38 Training Loss:0.080 Validation Loss:0.058021
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:39 Training Accuracy:0.636 Validation Accuracy:0.677
Epoch:39 Training Loss:0.091 Validation Loss:0.048867
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.36it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:40 Training Accuracy:0.687 Validation Accuracy:0.744
Epoch:40 Training Loss:0.085 Validation Loss:0.043795
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:41 Training Accuracy:0.693 Validation Accuracy:0.636
Epoch:41 Training Loss:0.081 Validation Loss:0.046516
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:42 Training Accuracy:0.627 Validation Accuracy:0.633
Epoch:42 Training Loss:0.078 Validation Loss:0.044867
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:43 Training Accuracy:0.645 Validation Accuracy:0.755
Epoch:43 Training Loss:0.077 Validation Loss:0.042432
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:44 Training Accuracy:0.654 Validation Accuracy:0.713
Epoch:44 Training Loss:0.080 Validation Loss:0.053033
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:45 Training Accuracy:0.695 Validation Accuracy:0.633
Epoch:45 Training Loss:0.079 Validation Loss:0.041677
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:46 Training Accuracy:0.682 Validation Accuracy:0.680
Epoch:46 Training Loss:0.078 Validation Loss:0.048806
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.36it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:47 Training Accuracy:0.668 Validation Accuracy:0.677
Epoch:47 Training Loss:0.088 Validation Loss:0.057597
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.041417788714170456
Fold:3

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 20.73it/s]

Epochs:1 Training Accuracy:0.505 Validation Accuracy:0.512
Epoch:1 Training Loss:0.997 Validation Loss:0.998495
Validation Loss decreased:inf --> 0.998495 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:2 Training Accuracy:0.503 Validation Accuracy:0.504
Epoch:2 Training Loss:0.959 Validation Loss:0.945769
Validation Loss decreased:0.998495 --> 0.945769 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:3 Training Accuracy:0.503 Validation Accuracy:0.501
Epoch:3 Training Loss:0.808 Validation Loss:0.750248
Validation Loss decreased:0.945769 --> 0.750248 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:4 Training Accuracy:0.486 Validation Accuracy:0.491
Epoch:4 Training Loss:0.711 Validation Loss:0.703509
Validation Loss decreased:0.750248 --> 0.703509 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.10it/s]

Epochs:5 Training Accuracy:0.483 Validation Accuracy:0.525
Epoch:5 Training Loss:0.584 Validation Loss:0.551300
Validation Loss decreased:0.703509 --> 0.551300 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.40it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:6 Training Accuracy:0.523 Validation Accuracy:0.579
Epoch:6 Training Loss:0.407 Validation Loss:0.431622
Validation Loss decreased:0.551300 --> 0.431622 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.10it/s]
100%|██████████| 3/3 [00:00<00:00, 21.32it/s]

Epochs:7 Training Accuracy:0.542 Validation Accuracy:0.563
Epoch:7 Training Loss:0.347 Validation Loss:0.309672
Validation Loss decreased:0.431622 --> 0.309672 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.94it/s]

Epochs:8 Training Accuracy:0.532 Validation Accuracy:0.532
Epoch:8 Training Loss:0.321 Validation Loss:0.287651
Validation Loss decreased:0.309672 --> 0.287651 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:9 Training Accuracy:0.565 Validation Accuracy:0.556
Epoch:9 Training Loss:0.307 Validation Loss:0.321289
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:10 Training Accuracy:0.552 Validation Accuracy:0.592
Epoch:10 Training Loss:0.298 Validation Loss:0.262909
Validation Loss decreased:0.287651 --> 0.262909 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:11 Training Accuracy:0.598 Validation Accuracy:0.581
Epoch:11 Training Loss:0.259 Validation Loss:0.229490
Validation Loss decreased:0.262909 --> 0.229490 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.48it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:12 Training Accuracy:0.595 Validation Accuracy:0.669
Epoch:12 Training Loss:0.225 Validation Loss:0.199971
Validation Loss decreased:0.229490 --> 0.199971 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.26it/s]

Epochs:13 Training Accuracy:0.641 Validation Accuracy:0.605
Epoch:13 Training Loss:0.177 Validation Loss:0.148359
Validation Loss decreased:0.199971 --> 0.148359 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.66it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:14 Training Accuracy:0.639 Validation Accuracy:0.607
Epoch:14 Training Loss:0.148 Validation Loss:0.121376
Validation Loss decreased:0.148359 --> 0.121376 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.37it/s]

Epochs:15 Training Accuracy:0.627 Validation Accuracy:0.711
Epoch:15 Training Loss:0.129 Validation Loss:0.079394
Validation Loss decreased:0.121376 --> 0.079394 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:16 Training Accuracy:0.637 Validation Accuracy:0.664
Epoch:16 Training Loss:0.105 Validation Loss:0.063978
Validation Loss decreased:0.079394 --> 0.063978 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.60it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:17 Training Accuracy:0.662 Validation Accuracy:0.664
Epoch:17 Training Loss:0.091 Validation Loss:0.049592
Validation Loss decreased:0.063978 --> 0.049592 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.53it/s]
100%|██████████| 3/3 [00:00<00:00, 19.71it/s]

Epochs:18 Training Accuracy:0.665 Validation Accuracy:0.628
Epoch:18 Training Loss:0.098 Validation Loss:0.074611
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:19 Training Accuracy:0.639 Validation Accuracy:0.680
Epoch:19 Training Loss:0.097 Validation Loss:0.045256
Validation Loss decreased:0.049592 --> 0.045256 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:20 Training Accuracy:0.673 Validation Accuracy:0.693
Epoch:20 Training Loss:0.088 Validation Loss:0.073284
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:21 Training Accuracy:0.656 Validation Accuracy:0.654
Epoch:21 Training Loss:0.082 Validation Loss:0.045840
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:22 Training Accuracy:0.670 Validation Accuracy:0.641
Epoch:22 Training Loss:0.087 Validation Loss:0.044305
Validation Loss decreased:0.045256 --> 0.044305 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:23 Training Accuracy:0.652 Validation Accuracy:0.687
Epoch:23 Training Loss:0.092 Validation Loss:0.065488
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:24 Training Accuracy:0.650 Validation Accuracy:0.661
Epoch:24 Training Loss:0.099 Validation Loss:0.050283
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 8.30it/s]
100%|██████████| 3/3 [00:00<00:00, 16.03it/s]

Epochs:25 Training Accuracy:0.636 Validation Accuracy:0.638
Epoch:25 Training Loss:0.086 Validation Loss:0.050906
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:26 Training Accuracy:0.683 Validation Accuracy:0.739

Epoch:26 Training Loss:0.096 Validation Loss:0.071561

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]

100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:27 Training Accuracy:0.678 Validation Accuracy:0.734

Epoch:27 Training Loss:0.088 Validation Loss:0.045076

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.40it/s]

Epochs:28 Training Accuracy:0.633 Validation Accuracy:0.661

Epoch:28 Training Loss:0.082 Validation Loss:0.041070

Validation Loss decreased:0.044305 --> 0.041070 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:29 Training Accuracy:0.682 Validation Accuracy:0.687

Epoch:29 Training Loss:0.083 Validation Loss:0.044796

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:30 Training Accuracy:0.672 Validation Accuracy:0.659

Epoch:30 Training Loss:0.093 Validation Loss:0.048411

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:31 Training Accuracy:0.660 Validation Accuracy:0.649

Epoch:31 Training Loss:0.089 Validation Loss:0.038208

Validation Loss decreased:0.041070 --> 0.038208 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]

100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:32 Training Accuracy:0.660 Validation Accuracy:0.625

Epoch:32 Training Loss:0.081 Validation Loss:0.044654

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:33 Training Accuracy:0.696 Validation Accuracy:0.698

Epoch:33 Training Loss:0.084 Validation Loss:0.045546

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.98it/s]

Epochs:34 Training Accuracy:0.664 Validation Accuracy:0.775

Epoch:34 Training Loss:0.086 Validation Loss:0.044714

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:35 Training Accuracy:0.671 Validation Accuracy:0.695

Epoch:35 Training Loss:0.085 Validation Loss:0.050290

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:36 Training Accuracy:0.711 Validation Accuracy:0.685

Epoch:36 Training Loss:0.084 Validation Loss:0.044591

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:37 Training Accuracy:0.675 Validation Accuracy:0.695

Epoch:37 Training Loss:0.081 Validation Loss:0.045562

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]

100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:38 Training Accuracy:0.661 Validation Accuracy:0.643

Epoch:38 Training Loss:0.089 Validation Loss:0.050231

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.03it/s]

100%|██████████| 3/3 [00:00<00:00, 20.84it/s]

Epochs:39 Training Accuracy:0.658 Validation Accuracy:0.698

Epoch:39 Training Loss:0.087 Validation Loss:0.048544

count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.60it/s]

100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:40 Training Accuracy:0.680 Validation Accuracy:0.698

Epoch:40 Training Loss:0.080 Validation Loss:0.042700

count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:41 Training Accuracy:0.605 Validation Accuracy:0.561

Epoch:41 Training Loss:0.090 Validation Loss:0.055181

count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:42 Training Accuracy:0.701 Validation Accuracy:0.612

Epoch:42 Training Loss:0.095 Validation Loss:0.045161

count patience:11 of 10

Meet Early Stopper so End Training...

And best Valid MAPE Loss:0.03820823132991791

Fold:4

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]

100%|██████████| 3/3 [00:00<00:00, 20.66it/s]

Epochs:1 Training Accuracy:0.506 Validation Accuracy:0.473

Epoch:1 Training Loss:0.996 Validation Loss:0.998199

Validation Loss decreased:inf --> 0.998199 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:2 Training Accuracy:0.496 Validation Accuracy:0.496
Epoch:2 Training Loss:0.951 Validation Loss:0.938476
Validation Loss decreased:0.998199 --> 0.938476 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]
100%|██████████| 3/3 [00:00<00:00, 13.58it/s]

Epochs:3 Training Accuracy:0.491 Validation Accuracy:0.494
Epoch:3 Training Loss:0.797 Validation Loss:0.733897
Validation Loss decreased:0.938476 --> 0.733897 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.53it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:4 Training Accuracy:0.413 Validation Accuracy:0.499
Epoch:4 Training Loss:0.694 Validation Loss:0.676221
Validation Loss decreased:0.733897 --> 0.676221 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:5 Training Accuracy:0.504 Validation Accuracy:0.605
Epoch:5 Training Loss:0.569 Validation Loss:0.517096
Validation Loss decreased:0.676221 --> 0.517096 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:6 Training Accuracy:0.556 Validation Accuracy:0.576
Epoch:6 Training Loss:0.376 Validation Loss:0.374231
Validation Loss decreased:0.517096 --> 0.374231 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.23it/s]

Epochs:7 Training Accuracy:0.583 Validation Accuracy:0.574
Epoch:7 Training Loss:0.330 Validation Loss:0.347936
Validation Loss decreased:0.374231 --> 0.347936 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.61it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:8 Training Accuracy:0.573 Validation Accuracy:0.620
Epoch:8 Training Loss:0.293 Validation Loss:0.381041
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:9 Training Accuracy:0.606 Validation Accuracy:0.540
Epoch:9 Training Loss:0.265 Validation Loss:0.325053
Validation Loss decreased:0.347936 --> 0.325053 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.32it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:10 Training Accuracy:0.592 Validation Accuracy:0.669
Epoch:10 Training Loss:0.245 Validation Loss:0.260625
Validation Loss decreased:0.325053 --> 0.260625 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:11 Training Accuracy:0.639 Validation Accuracy:0.643
Epoch:11 Training Loss:0.189 Validation Loss:0.205682
Validation Loss decreased:0.260625 --> 0.205682 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:12 Training Accuracy:0.635 Validation Accuracy:0.636
Epoch:12 Training Loss:0.172 Validation Loss:0.155470
Validation Loss decreased:0.205682 --> 0.155470 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:13 Training Accuracy:0.642 Validation Accuracy:0.602
Epoch:13 Training Loss:0.137 Validation Loss:0.220557
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:14 Training Accuracy:0.639 Validation Accuracy:0.659
Epoch:14 Training Loss:0.130 Validation Loss:0.173858
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:15 Training Accuracy:0.650 Validation Accuracy:0.661
Epoch:15 Training Loss:0.115 Validation Loss:0.080457
Validation Loss decreased:0.155470 --> 0.080457 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.33it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:16 Training Accuracy:0.671 Validation Accuracy:0.574
Epoch:16 Training Loss:0.096 Validation Loss:0.148270
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:17 Training Accuracy:0.689 Validation Accuracy:0.677
Epoch:17 Training Loss:0.098 Validation Loss:0.063044
Validation Loss decreased:0.080457 --> 0.063044 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:18 Training Accuracy:0.638 Validation Accuracy:0.698
Epoch:18 Training Loss:0.102 Validation Loss:0.134006
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:19 Training Accuracy:0.670 Validation Accuracy:0.667
Epoch:19 Training Loss:0.097 Validation Loss:0.143729
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:20 Training Accuracy:0.599 Validation Accuracy:0.584
Epoch:20 Training Loss:0.092 Validation Loss:0.132008
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:21 Training Accuracy:0.688 Validation Accuracy:0.633
Epoch:21 Training Loss:0.091 Validation Loss:0.077731
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 9.94it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:22 Training Accuracy:0.633 Validation Accuracy:0.612
Epoch:22 Training Loss:0.086 Validation Loss:0.106432
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:23 Training Accuracy:0.656 Validation Accuracy:0.672
Epoch:23 Training Loss:0.088 Validation Loss:0.148590
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:24 Training Accuracy:0.669 Validation Accuracy:0.695
Epoch:24 Training Loss:0.088 Validation Loss:0.097421
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:25 Training Accuracy:0.663 Validation Accuracy:0.654
Epoch:25 Training Loss:0.090 Validation Loss:0.105225
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:26 Training Accuracy:0.637 Validation Accuracy:0.566
Epoch:26 Training Loss:0.082 Validation Loss:0.061586
Validation Loss decreased:0.063044 --> 0.061586 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:27 Training Accuracy:0.668 Validation Accuracy:0.711
Epoch:27 Training Loss:0.082 Validation Loss:0.113904
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:28 Training Accuracy:0.662 Validation Accuracy:0.643
Epoch:28 Training Loss:0.080 Validation Loss:0.116628
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:29 Training Accuracy:0.628 Validation Accuracy:0.677
Epoch:29 Training Loss:0.088 Validation Loss:0.062091
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.33it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:30 Training Accuracy:0.686 Validation Accuracy:0.649
Epoch:30 Training Loss:0.081 Validation Loss:0.103551
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:31 Training Accuracy:0.698 Validation Accuracy:0.721
Epoch:31 Training Loss:0.088 Validation Loss:0.084830
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:32 Training Accuracy:0.640 Validation Accuracy:0.618
Epoch:32 Training Loss:0.084 Validation Loss:0.124512
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:33 Training Accuracy:0.689 Validation Accuracy:0.747
Epoch:33 Training Loss:0.082 Validation Loss:0.102579
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:34 Training Accuracy:0.660 Validation Accuracy:0.734
Epoch:34 Training Loss:0.081 Validation Loss:0.110122
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.40it/s]

Epochs:35 Training Accuracy:0.662 Validation Accuracy:0.643
Epoch:35 Training Loss:0.086 Validation Loss:0.118488
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:36 Training Accuracy:0.655 Validation Accuracy:0.597
Epoch:36 Training Loss:0.086 Validation Loss:0.061797
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.26it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:37 Training Accuracy:0.667 Validation Accuracy:0.656
Epoch:37 Training Loss:0.088 Validation Loss:0.095491
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.06158649921417236
Fold:5

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.13it/s]

Epochs:1 Training Accuracy:0.501 Validation Accuracy:0.481
Epoch:1 Training Loss:0.996 Validation Loss:0.997983
Validation Loss decreased:inf --> 0.997983 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:2 Training Accuracy:0.502 Validation Accuracy:0.509
Epoch:2 Training Loss:0.953 Validation Loss:0.937230
Validation Loss decreased:0.997983 --> 0.937230 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:3 Training Accuracy:0.487 Validation Accuracy:0.499
Epoch:3 Training Loss:0.798 Validation Loss:0.764414
Validation Loss decreased:0.937230 --> 0.764414 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:4 Training Accuracy:0.472 Validation Accuracy:0.517
Epoch:4 Training Loss:0.703 Validation Loss:0.667203
Validation Loss decreased:0.764414 --> 0.667203 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.45it/s]
100%|██████████| 3/3 [00:00<00:00, 19.47it/s]

Epochs:5 Training Accuracy:0.484 Validation Accuracy:0.630
Epoch:5 Training Loss:0.585 Validation Loss:0.556362
Validation Loss decreased:0.667203 --> 0.556362 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 19.71it/s]

Epochs:6 Training Accuracy:0.518 Validation Accuracy:0.592
Epoch:6 Training Loss:0.392 Validation Loss:0.400521
Validation Loss decreased:0.556362 --> 0.400521 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:7 Training Accuracy:0.549 Validation Accuracy:0.514
Epoch:7 Training Loss:0.333 Validation Loss:0.362660
Validation Loss decreased:0.400521 --> 0.362660 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:8 Training Accuracy:0.563 Validation Accuracy:0.452
Epoch:8 Training Loss:0.311 Validation Loss:0.349382
Validation Loss decreased:0.362660 --> 0.349382 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:9 Training Accuracy:0.572 Validation Accuracy:0.579
Epoch:9 Training Loss:0.297 Validation Loss:0.273183
Validation Loss decreased:0.349382 --> 0.273183 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:10 Training Accuracy:0.584 Validation Accuracy:0.576
Epoch:10 Training Loss:0.259 Validation Loss:0.234808
Validation Loss decreased:0.273183 --> 0.234808 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:11 Training Accuracy:0.590 Validation Accuracy:0.618
Epoch:11 Training Loss:0.239 Validation Loss:0.208443
Validation Loss decreased:0.234808 --> 0.208443 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 20.66it/s]

Epochs:12 Training Accuracy:0.589 Validation Accuracy:0.607
Epoch:12 Training Loss:0.211 Validation Loss:0.153138
Validation Loss decreased:0.208443 --> 0.153138 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.49it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:13 Training Accuracy:0.639 Validation Accuracy:0.628
Epoch:13 Training Loss:0.175 Validation Loss:0.122203
Validation Loss decreased:0.153138 --> 0.122203 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:14 Training Accuracy:0.660 Validation Accuracy:0.685
Epoch:14 Training Loss:0.140 Validation Loss:0.106797
Validation Loss decreased:0.122203 --> 0.106797 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:15 Training Accuracy:0.660 Validation Accuracy:0.615
Epoch:15 Training Loss:0.128 Validation Loss:0.093518
Validation Loss decreased:0.106797 --> 0.093518 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:16 Training Accuracy:0.660 Validation Accuracy:0.633
Epoch:16 Training Loss:0.113 Validation Loss:0.087872
Validation Loss decreased:0.093518 --> 0.087872 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:17 Training Accuracy:0.665 Validation Accuracy:0.620
Epoch:17 Training Loss:0.110 Validation Loss:0.072183
Validation Loss decreased:0.087872 --> 0.072183 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:18 Training Accuracy:0.648 Validation Accuracy:0.690
Epoch:18 Training Loss:0.100 Validation Loss:0.062165
Validation Loss decreased:0.072183 --> 0.062165 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.07it/s]

Epochs:19 Training Accuracy:0.683 Validation Accuracy:0.659
Epoch:19 Training Loss:0.097 Validation Loss:0.071023
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:20 Training Accuracy:0.644 Validation Accuracy:0.630
Epoch:20 Training Loss:0.099 Validation Loss:0.064031
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:21 Training Accuracy:0.671 Validation Accuracy:0.618
Epoch:21 Training Loss:0.099 Validation Loss:0.059994
Validation Loss decreased:0.062165 --> 0.059994 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:22 Training Accuracy:0.700 Validation Accuracy:0.721
Epoch:22 Training Loss:0.090 Validation Loss:0.047622
Validation Loss decreased:0.059994 --> 0.047622 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.31it/s]
100%|██████████| 3/3 [00:00<00:00, 19.20it/s]

Epochs:23 Training Accuracy:0.613 Validation Accuracy:0.734
Epoch:23 Training Loss:0.087 Validation Loss:0.049985
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:24 Training Accuracy:0.634 Validation Accuracy:0.630
Epoch:24 Training Loss:0.085 Validation Loss:0.054852
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.28it/s]
100%|██████████| 3/3 [00:00<00:00, 20.38it/s]

Epochs:25 Training Accuracy:0.647 Validation Accuracy:0.654
Epoch:25 Training Loss:0.094 Validation Loss:0.050299
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:26 Training Accuracy:0.687 Validation Accuracy:0.739
Epoch:26 Training Loss:0.101 Validation Loss:0.068466
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:27 Training Accuracy:0.679 Validation Accuracy:0.605
Epoch:27 Training Loss:0.088 Validation Loss:0.051178
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:28 Training Accuracy:0.681 Validation Accuracy:0.705
Epoch:28 Training Loss:0.084 Validation Loss:0.054125
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:29 Training Accuracy:0.672 Validation Accuracy:0.579
Epoch:29 Training Loss:0.087 Validation Loss:0.074444
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:30 Training Accuracy:0.645 Validation Accuracy:0.698
Epoch:30 Training Loss:0.089 Validation Loss:0.050445
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:31 Training Accuracy:0.696 Validation Accuracy:0.693
Epoch:31 Training Loss:0.094 Validation Loss:0.068092
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.44it/s]
100%|██████████| 3/3 [00:00<00:00, 19.62it/s]

Epochs:32 Training Accuracy:0.648 Validation Accuracy:0.698
Epoch:32 Training Loss:0.086 Validation Loss:0.047135
Validation Loss decreased:0.047622 --> 0.047135 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:33 Training Accuracy:0.669 Validation Accuracy:0.726
Epoch:33 Training Loss:0.080 Validation Loss:0.048451
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:34 Training Accuracy:0.649 Validation Accuracy:0.731
Epoch:34 Training Loss:0.084 Validation Loss:0.046727
Validation Loss decreased:0.047135 --> 0.046727 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:35 Training Accuracy:0.644 Validation Accuracy:0.700
Epoch:35 Training Loss:0.082 Validation Loss:0.050012
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:36 Training Accuracy:0.663 Validation Accuracy:0.638
Epoch:36 Training Loss:0.081 Validation Loss:0.044872
Validation Loss decreased:0.046727 --> 0.044872 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:37 Training Accuracy:0.647 Validation Accuracy:0.708
Epoch:37 Training Loss:0.085 Validation Loss:0.047037
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:38 Training Accuracy:0.656 Validation Accuracy:0.693
Epoch:38 Training Loss:0.087 Validation Loss:0.045416
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.07it/s]
100%|██████████| 3/3 [00:00<00:00, 20.93it/s]

Epochs:39 Training Accuracy:0.685 Validation Accuracy:0.674
Epoch:39 Training Loss:0.086 Validation Loss:0.056838
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 20.83it/s]

Epochs:40 Training Accuracy:0.636 Validation Accuracy:0.641
Epoch:40 Training Loss:0.094 Validation Loss:0.058823
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:41 Training Accuracy:0.637 Validation Accuracy:0.672
Epoch:41 Training Loss:0.081 Validation Loss:0.052733
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:42 Training Accuracy:0.622 Validation Accuracy:0.685
Epoch:42 Training Loss:0.083 Validation Loss:0.050648
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.29it/s]
100%|██████████| 3/3 [00:00<00:00, 19.37it/s]

Epochs:43 Training Accuracy:0.688 Validation Accuracy:0.594
Epoch:43 Training Loss:0.083 Validation Loss:0.054622
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:44 Training Accuracy:0.655 Validation Accuracy:0.664
Epoch:44 Training Loss:0.078 Validation Loss:0.046641
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:45 Training Accuracy:0.656 Validation Accuracy:0.638
Epoch:45 Training Loss:0.088 Validation Loss:0.045225
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:46 Training Accuracy:0.657 Validation Accuracy:0.682
Epoch:46 Training Loss:0.078 Validation Loss:0.046876
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:47 Training Accuracy:0.640 Validation Accuracy:0.633
Epoch:47 Training Loss:0.087 Validation Loss:0.050627
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.04487229511141777

-----US30-----

Fold:1

100%|██████████| 15/15 [00:01<00:00, 10.96it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:1 Training Accuracy:0.488 Validation Accuracy:0.478
Epoch:1 Training Loss:0.999 Validation Loss:0.999645
Validation Loss decreased:inf --> 0.999645 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:2 Training Accuracy:0.497 Validation Accuracy:0.496
Epoch:2 Training Loss:0.990 Validation Loss:0.986030
Validation Loss decreased:0.999645 --> 0.986030 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.95it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:3 Training Accuracy:0.507 Validation Accuracy:0.509
Epoch:3 Training Loss:0.945 Validation Loss:0.906235
Validation Loss decreased:0.986030 --> 0.906235 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:4 Training Accuracy:0.508 Validation Accuracy:0.496
Epoch:4 Training Loss:0.810 Validation Loss:0.701528
Validation Loss decreased:0.906235 --> 0.701528 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 17.66it/s]

Epochs:5 Training Accuracy:0.487 Validation Accuracy:0.501
Epoch:5 Training Loss:0.599 Validation Loss:0.486205
Validation Loss decreased:0.701528 --> 0.486205 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:6 Training Accuracy:0.494 Validation Accuracy:0.522

Epoch:6 Training Loss:0.381 Validation Loss:0.272164

Validation Loss decreased:0.486205 --> 0.272164 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]

100%|██████████| 3/3 [00:00<00:00, 21.03it/s]

Epochs:7 Training Accuracy:0.563 Validation Accuracy:0.643

Epoch:7 Training Loss:0.286 Validation Loss:0.224771

Validation Loss decreased:0.272164 --> 0.224771 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]

100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:8 Training Accuracy:0.587 Validation Accuracy:0.654

Epoch:8 Training Loss:0.255 Validation Loss:0.223171

Validation Loss decreased:0.224771 --> 0.223171 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:9 Training Accuracy:0.617 Validation Accuracy:0.571

Epoch:9 Training Loss:0.228 Validation Loss:0.189757

Validation Loss decreased:0.223171 --> 0.189757 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.95it/s]

100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:10 Training Accuracy:0.605 Validation Accuracy:0.651

Epoch:10 Training Loss:0.213 Validation Loss:0.202358

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:11 Training Accuracy:0.618 Validation Accuracy:0.615

Epoch:11 Training Loss:0.206 Validation Loss:0.175944

Validation Loss decreased:0.189757 --> 0.175944 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.24it/s]

100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:12 Training Accuracy:0.625 Validation Accuracy:0.667

Epoch:12 Training Loss:0.201 Validation Loss:0.160991

Validation Loss decreased:0.175944 --> 0.160991 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:13 Training Accuracy:0.633 Validation Accuracy:0.695

Epoch:13 Training Loss:0.193 Validation Loss:0.161632

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:14 Training Accuracy:0.623 Validation Accuracy:0.693

Epoch:14 Training Loss:0.192 Validation Loss:0.149710

Validation Loss decreased:0.160991 --> 0.149710 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.14it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:15 Training Accuracy:0.649 Validation Accuracy:0.677
Epoch:15 Training Loss:0.181 Validation Loss:0.165179
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:16 Training Accuracy:0.625 Validation Accuracy:0.630
Epoch:16 Training Loss:0.184 Validation Loss:0.134883
Validation Loss decreased:0.149710 --> 0.134883 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:17 Training Accuracy:0.642 Validation Accuracy:0.561
Epoch:17 Training Loss:0.163 Validation Loss:0.117085
Validation Loss decreased:0.134883 --> 0.117085 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.33it/s]
100%|██████████| 3/3 [00:00<00:00, 19.37it/s]

Epochs:18 Training Accuracy:0.623 Validation Accuracy:0.680
Epoch:18 Training Loss:0.142 Validation Loss:0.114918
Validation Loss decreased:0.117085 --> 0.114918 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:19 Training Accuracy:0.631 Validation Accuracy:0.747
Epoch:19 Training Loss:0.143 Validation Loss:0.110033
Validation Loss decreased:0.114918 --> 0.110033 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:20 Training Accuracy:0.639 Validation Accuracy:0.724
Epoch:20 Training Loss:0.138 Validation Loss:0.094334
Validation Loss decreased:0.110033 --> 0.094334 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:21 Training Accuracy:0.681 Validation Accuracy:0.698
Epoch:21 Training Loss:0.131 Validation Loss:0.088127
Validation Loss decreased:0.094334 --> 0.088127 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:22 Training Accuracy:0.658 Validation Accuracy:0.685
Epoch:22 Training Loss:0.116 Validation Loss:0.076826
Validation Loss decreased:0.088127 --> 0.076826 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:23 Training Accuracy:0.659 Validation Accuracy:0.672
Epoch:23 Training Loss:0.114 Validation Loss:0.070870
Validation Loss decreased:0.076826 --> 0.070870 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.49it/s]
100%|██████████| 3/3 [00:00<00:00, 18.94it/s]

Epochs:24 Training Accuracy:0.634 Validation Accuracy:0.659
Epoch:24 Training Loss:0.098 Validation Loss:0.070420
Validation Loss decreased:0.070870 --> 0.070420 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:25 Training Accuracy:0.706 Validation Accuracy:0.687
Epoch:25 Training Loss:0.091 Validation Loss:0.059046
Validation Loss decreased:0.070420 --> 0.059046 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:26 Training Accuracy:0.654 Validation Accuracy:0.682
Epoch:26 Training Loss:0.087 Validation Loss:0.059845
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:27 Training Accuracy:0.624 Validation Accuracy:0.711
Epoch:27 Training Loss:0.083 Validation Loss:0.053151
Validation Loss decreased:0.059046 --> 0.053151 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:28 Training Accuracy:0.672 Validation Accuracy:0.517
Epoch:28 Training Loss:0.084 Validation Loss:0.058413
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.88it/s]

Epochs:29 Training Accuracy:0.684 Validation Accuracy:0.633
Epoch:29 Training Loss:0.094 Validation Loss:0.048265
Validation Loss decreased:0.053151 --> 0.048265 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:30 Training Accuracy:0.658 Validation Accuracy:0.734
Epoch:30 Training Loss:0.083 Validation Loss:0.047353
Validation Loss decreased:0.048265 --> 0.047353 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.15it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:31 Training Accuracy:0.648 Validation Accuracy:0.674
Epoch:31 Training Loss:0.083 Validation Loss:0.045380
Validation Loss decreased:0.047353 --> 0.045380 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:32 Training Accuracy:0.618 Validation Accuracy:0.643
Epoch:32 Training Loss:0.079 Validation Loss:0.043804
Validation Loss decreased:0.045380 --> 0.043804 So saving the model
100%|██████████| 15/15 [00:01<00:00, 9.98it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:33 Training Accuracy:0.659 Validation Accuracy:0.736

Epoch:33 Training Loss:0.077 Validation Loss:0.043860

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:34 Training Accuracy:0.636 Validation Accuracy:0.550

Epoch:34 Training Loss:0.085 Validation Loss:0.045203

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:35 Training Accuracy:0.624 Validation Accuracy:0.581

Epoch:35 Training Loss:0.082 Validation Loss:0.045934

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:36 Training Accuracy:0.670 Validation Accuracy:0.690

Epoch:36 Training Loss:0.087 Validation Loss:0.041777

Validation Loss decreased:0.043804 --> 0.041777 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]

100%|██████████| 3/3 [00:00<00:00, 19.69it/s]

Epochs:37 Training Accuracy:0.705 Validation Accuracy:0.693

Epoch:37 Training Loss:0.079 Validation Loss:0.045891

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:38 Training Accuracy:0.647 Validation Accuracy:0.698

Epoch:38 Training Loss:0.095 Validation Loss:0.048131

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:39 Training Accuracy:0.664 Validation Accuracy:0.592

Epoch:39 Training Loss:0.081 Validation Loss:0.055581

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:40 Training Accuracy:0.661 Validation Accuracy:0.599

Epoch:40 Training Loss:0.084 Validation Loss:0.040496

Validation Loss decreased:0.041777 --> 0.040496 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:41 Training Accuracy:0.651 Validation Accuracy:0.669

Epoch:41 Training Loss:0.090 Validation Loss:0.039798

Validation Loss decreased:0.040496 --> 0.039798 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:42 Training Accuracy:0.673 Validation Accuracy:0.744

Epoch:42 Training Loss:0.080 Validation Loss:0.053548

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:43 Training Accuracy:0.660 Validation Accuracy:0.641

Epoch:43 Training Loss:0.080 Validation Loss:0.036743

Validation Loss decreased:0.039798 --> 0.036743 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.18it/s]

100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:44 Training Accuracy:0.655 Validation Accuracy:0.695

Epoch:44 Training Loss:0.073 Validation Loss:0.038677

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]

100%|██████████| 3/3 [00:00<00:00, 21.30it/s]

Epochs:45 Training Accuracy:0.672 Validation Accuracy:0.744

Epoch:45 Training Loss:0.081 Validation Loss:0.046051

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:46 Training Accuracy:0.684 Validation Accuracy:0.641

Epoch:46 Training Loss:0.073 Validation Loss:0.042205

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:47 Training Accuracy:0.669 Validation Accuracy:0.649

Epoch:47 Training Loss:0.080 Validation Loss:0.041699

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:48 Training Accuracy:0.649 Validation Accuracy:0.687

Epoch:48 Training Loss:0.078 Validation Loss:0.053620

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:49 Training Accuracy:0.649 Validation Accuracy:0.641

Epoch:49 Training Loss:0.092 Validation Loss:0.054621

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:50 Training Accuracy:0.630 Validation Accuracy:0.597

Epoch:50 Training Loss:0.082 Validation Loss:0.042068

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:51 Training Accuracy:0.645 Validation Accuracy:0.672
Epoch:51 Training Loss:0.079 Validation Loss:0.047402
count patience:8 of 10
100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.09it/s]

Epochs:52 Training Accuracy:0.631 Validation Accuracy:0.708
Epoch:52 Training Loss:0.078 Validation Loss:0.040924
count patience:9 of 10
100%|██████████| 15/15 [00:01<00:00, 9.99it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:53 Training Accuracy:0.634 Validation Accuracy:0.749
Epoch:53 Training Loss:0.074 Validation Loss:0.037186
count patience:10 of 10
100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.47it/s]

Epochs:54 Training Accuracy:0.639 Validation Accuracy:0.698
Epoch:54 Training Loss:0.070 Validation Loss:0.038313
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03674301132559776
Fold:2

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:1 Training Accuracy:0.500 Validation Accuracy:0.491
Epoch:1 Training Loss:0.999 Validation Loss:0.999661
Validation Loss decreased:inf --> 0.999661 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.91it/s]

Epochs:2 Training Accuracy:0.502 Validation Accuracy:0.501
Epoch:2 Training Loss:0.991 Validation Loss:0.986405
Validation Loss decreased:0.999661 --> 0.986405 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:3 Training Accuracy:0.495 Validation Accuracy:0.512
Epoch:3 Training Loss:0.951 Validation Loss:0.908508
Validation Loss decreased:0.986405 --> 0.908508 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.36it/s]
100%|██████████| 3/3 [00:00<00:00, 21.19it/s]

Epochs:4 Training Accuracy:0.489 Validation Accuracy:0.519
Epoch:4 Training Loss:0.832 Validation Loss:0.702495
Validation Loss decreased:0.908508 --> 0.702495 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:5 Training Accuracy:0.484 Validation Accuracy:0.481
Epoch:5 Training Loss:0.630 Validation Loss:0.515195
Validation Loss decreased:0.702495 --> 0.515195 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.92it/s]
100%|██████████| 3/3 [00:00<00:00, 21.37it/s]

Epochs:6 Training Accuracy:0.495 Validation Accuracy:0.599
Epoch:6 Training Loss:0.402 Validation Loss:0.310055
Validation Loss decreased:0.515195 --> 0.310055 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:7 Training Accuracy:0.532 Validation Accuracy:0.561
Epoch:7 Training Loss:0.296 Validation Loss:0.230672
Validation Loss decreased:0.310055 --> 0.230672 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.61it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:8 Training Accuracy:0.602 Validation Accuracy:0.517
Epoch:8 Training Loss:0.246 Validation Loss:0.209314
Validation Loss decreased:0.230672 --> 0.209314 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:9 Training Accuracy:0.624 Validation Accuracy:0.661
Epoch:9 Training Loss:0.221 Validation Loss:0.216808
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.40it/s]
100%|██████████| 3/3 [00:00<00:00, 20.87it/s]

Epochs:10 Training Accuracy:0.635 Validation Accuracy:0.690
Epoch:10 Training Loss:0.209 Validation Loss:0.259131
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:11 Training Accuracy:0.610 Validation Accuracy:0.623
Epoch:11 Training Loss:0.211 Validation Loss:0.287903
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:12 Training Accuracy:0.622 Validation Accuracy:0.680
Epoch:12 Training Loss:0.206 Validation Loss:0.282946
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:13 Training Accuracy:0.650 Validation Accuracy:0.638
Epoch:13 Training Loss:0.197 Validation Loss:0.172583
Validation Loss decreased:0.209314 --> 0.172583 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:14 Training Accuracy:0.630 Validation Accuracy:0.602
Epoch:14 Training Loss:0.181 Validation Loss:0.289085
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:15 Training Accuracy:0.647 Validation Accuracy:0.693
Epoch:15 Training Loss:0.175 Validation Loss:0.295824
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:16 Training Accuracy:0.658 Validation Accuracy:0.615
Epoch:16 Training Loss:0.169 Validation Loss:0.305038
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.30it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:17 Training Accuracy:0.631 Validation Accuracy:0.708
Epoch:17 Training Loss:0.153 Validation Loss:0.254951
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.12it/s]
100%|██████████| 3/3 [00:00<00:00, 18.63it/s]

Epochs:18 Training Accuracy:0.639 Validation Accuracy:0.693
Epoch:18 Training Loss:0.155 Validation Loss:0.249670
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.64it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:19 Training Accuracy:0.654 Validation Accuracy:0.687
Epoch:19 Training Loss:0.146 Validation Loss:0.222145
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:20 Training Accuracy:0.630 Validation Accuracy:0.672
Epoch:20 Training Loss:0.140 Validation Loss:0.098077
Validation Loss decreased:0.172583 --> 0.098077 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:21 Training Accuracy:0.651 Validation Accuracy:0.556
Epoch:21 Training Loss:0.134 Validation Loss:0.190401
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:22 Training Accuracy:0.657 Validation Accuracy:0.698
Epoch:22 Training Loss:0.122 Validation Loss:0.082481
Validation Loss decreased:0.098077 --> 0.082481 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:23 Training Accuracy:0.660 Validation Accuracy:0.592
Epoch:23 Training Loss:0.117 Validation Loss:0.079519
Validation Loss decreased:0.082481 --> 0.079519 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.33it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:24 Training Accuracy:0.652 Validation Accuracy:0.623
Epoch:24 Training Loss:0.116 Validation Loss:0.175365
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:25 Training Accuracy:0.668 Validation Accuracy:0.623
Epoch:25 Training Loss:0.103 Validation Loss:0.137904
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:26 Training Accuracy:0.670 Validation Accuracy:0.649
Epoch:26 Training Loss:0.095 Validation Loss:0.126124
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:27 Training Accuracy:0.661 Validation Accuracy:0.599
Epoch:27 Training Loss:0.103 Validation Loss:0.121353
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:28 Training Accuracy:0.642 Validation Accuracy:0.633
Epoch:28 Training Loss:0.091 Validation Loss:0.115539
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:29 Training Accuracy:0.654 Validation Accuracy:0.674
Epoch:29 Training Loss:0.085 Validation Loss:0.044062
Validation Loss decreased:0.079519 --> 0.044062 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.24it/s]

Epochs:30 Training Accuracy:0.693 Validation Accuracy:0.687
Epoch:30 Training Loss:0.090 Validation Loss:0.095330
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.12it/s]
100%|██████████| 3/3 [00:00<00:00, 20.87it/s]

Epochs:31 Training Accuracy:0.660 Validation Accuracy:0.661
Epoch:31 Training Loss:0.091 Validation Loss:0.087292
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:32 Training Accuracy:0.612 Validation Accuracy:0.558
Epoch:32 Training Loss:0.091 Validation Loss:0.085643
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:33 Training Accuracy:0.652 Validation Accuracy:0.721
Epoch:33 Training Loss:0.094 Validation Loss:0.085806
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:34 Training Accuracy:0.650 Validation Accuracy:0.698
Epoch:34 Training Loss:0.090 Validation Loss:0.091166
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.56it/s]

Epochs:35 Training Accuracy:0.621 Validation Accuracy:0.636
Epoch:35 Training Loss:0.089 Validation Loss:0.084246
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:36 Training Accuracy:0.626 Validation Accuracy:0.636
Epoch:36 Training Loss:0.081 Validation Loss:0.083311
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.01it/s]

Epochs:37 Training Accuracy:0.671 Validation Accuracy:0.690
Epoch:37 Training Loss:0.090 Validation Loss:0.042074
Validation Loss decreased:0.044062 --> 0.042074 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.77it/s]
100%|██████████| 3/3 [00:00<00:00, 19.04it/s]

Epochs:38 Training Accuracy:0.644 Validation Accuracy:0.641
Epoch:38 Training Loss:0.086 Validation Loss:0.100485
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:39 Training Accuracy:0.675 Validation Accuracy:0.672
Epoch:39 Training Loss:0.081 Validation Loss:0.103275
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.36it/s]

Epochs:40 Training Accuracy:0.693 Validation Accuracy:0.693
Epoch:40 Training Loss:0.083 Validation Loss:0.039537
Validation Loss decreased:0.042074 --> 0.039537 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.19it/s]

Epochs:41 Training Accuracy:0.658 Validation Accuracy:0.765
Epoch:41 Training Loss:0.083 Validation Loss:0.096282
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:42 Training Accuracy:0.680 Validation Accuracy:0.703
Epoch:42 Training Loss:0.076 Validation Loss:0.038084
Validation Loss decreased:0.039537 --> 0.038084 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.44it/s]

Epochs:43 Training Accuracy:0.641 Validation Accuracy:0.729
Epoch:43 Training Loss:0.082 Validation Loss:0.100379
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.44it/s]
100%|██████████| 3/3 [00:00<00:00, 21.06it/s]

Epochs:44 Training Accuracy:0.665 Validation Accuracy:0.620
Epoch:44 Training Loss:0.082 Validation Loss:0.107831
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:45 Training Accuracy:0.650 Validation Accuracy:0.646
Epoch:45 Training Loss:0.087 Validation Loss:0.047725
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.52it/s]

Epochs:46 Training Accuracy:0.674 Validation Accuracy:0.584
Epoch:46 Training Loss:0.077 Validation Loss:0.118234
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.89it/s]

Epochs:47 Training Accuracy:0.669 Validation Accuracy:0.721
Epoch:47 Training Loss:0.081 Validation Loss:0.108600
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:48 Training Accuracy:0.673 Validation Accuracy:0.680
Epoch:48 Training Loss:0.077 Validation Loss:0.044160
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:49 Training Accuracy:0.662 Validation Accuracy:0.628
Epoch:49 Training Loss:0.077 Validation Loss:0.082281
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:50 Training Accuracy:0.654 Validation Accuracy:0.623
Epoch:50 Training Loss:0.081 Validation Loss:0.083862
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.56it/s]
100%|██████████| 3/3 [00:00<00:00, 19.41it/s]

Epochs:51 Training Accuracy:0.666 Validation Accuracy:0.602
Epoch:51 Training Loss:0.076 Validation Loss:0.091726
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 19.60it/s]

Epochs:52 Training Accuracy:0.656 Validation Accuracy:0.682
Epoch:52 Training Loss:0.080 Validation Loss:0.109526
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:53 Training Accuracy:0.635 Validation Accuracy:0.641
Epoch:53 Training Loss:0.075 Validation Loss:0.137069
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03808439150452614
Fold:3

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:1 Training Accuracy:0.500 Validation Accuracy:0.540
Epoch:1 Training Loss:0.999 Validation Loss:0.999704
Validation Loss decreased:inf --> 0.999704 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:2 Training Accuracy:0.509 Validation Accuracy:0.499
Epoch:2 Training Loss:0.991 Validation Loss:0.986757
Validation Loss decreased:0.999704 --> 0.986757 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.91it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:3 Training Accuracy:0.487 Validation Accuracy:0.473
Epoch:3 Training Loss:0.949 Validation Loss:0.912679
Validation Loss decreased:0.986757 --> 0.912679 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.60it/s]

Epochs:4 Training Accuracy:0.495 Validation Accuracy:0.499
Epoch:4 Training Loss:0.822 Validation Loss:0.729148
Validation Loss decreased:0.912679 --> 0.729148 So saving the model

100%|██████████| 15/15 [00:01<00:00, 7.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:5 Training Accuracy:0.461 Validation Accuracy:0.512
Epoch:5 Training Loss:0.620 Validation Loss:0.520320
Validation Loss decreased:0.729148 --> 0.520320 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:6 Training Accuracy:0.513 Validation Accuracy:0.633

Epoch:6 Training Loss:0.401 Validation Loss:0.278678

Validation Loss decreased:0.520320 --> 0.278678 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]

100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:7 Training Accuracy:0.547 Validation Accuracy:0.630

Epoch:7 Training Loss:0.284 Validation Loss:0.248105

Validation Loss decreased:0.278678 --> 0.248105 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]

100%|██████████| 3/3 [00:00<00:00, 21.91it/s]

Epochs:8 Training Accuracy:0.602 Validation Accuracy:0.618

Epoch:8 Training Loss:0.247 Validation Loss:0.232582

Validation Loss decreased:0.248105 --> 0.232582 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:9 Training Accuracy:0.621 Validation Accuracy:0.625

Epoch:9 Training Loss:0.229 Validation Loss:0.202898

Validation Loss decreased:0.232582 --> 0.202898 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:10 Training Accuracy:0.609 Validation Accuracy:0.641

Epoch:10 Training Loss:0.210 Validation Loss:0.201294

Validation Loss decreased:0.202898 --> 0.201294 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.02it/s]

100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:11 Training Accuracy:0.647 Validation Accuracy:0.602

Epoch:11 Training Loss:0.213 Validation Loss:0.197653

Validation Loss decreased:0.201294 --> 0.197653 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:12 Training Accuracy:0.607 Validation Accuracy:0.630

Epoch:12 Training Loss:0.193 Validation Loss:0.177987

Validation Loss decreased:0.197653 --> 0.177987 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:13 Training Accuracy:0.631 Validation Accuracy:0.599

Epoch:13 Training Loss:0.190 Validation Loss:0.178321

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:14 Training Accuracy:0.632 Validation Accuracy:0.651

Epoch:14 Training Loss:0.187 Validation Loss:0.175548

Validation Loss decreased:0.177987 --> 0.175548 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:15 Training Accuracy:0.634 Validation Accuracy:0.739
Epoch:15 Training Loss:0.163 Validation Loss:0.150837
Validation Loss decreased:0.175548 --> 0.150837 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.23it/s]

Epochs:16 Training Accuracy:0.649 Validation Accuracy:0.651
Epoch:16 Training Loss:0.162 Validation Loss:0.144288
Validation Loss decreased:0.150837 --> 0.144288 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.40it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:17 Training Accuracy:0.617 Validation Accuracy:0.651
Epoch:17 Training Loss:0.162 Validation Loss:0.128617
Validation Loss decreased:0.144288 --> 0.128617 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:18 Training Accuracy:0.684 Validation Accuracy:0.672
Epoch:18 Training Loss:0.142 Validation Loss:0.130683
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.93it/s]

Epochs:19 Training Accuracy:0.680 Validation Accuracy:0.656
Epoch:19 Training Loss:0.151 Validation Loss:0.109594
Validation Loss decreased:0.128617 --> 0.109594 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:20 Training Accuracy:0.650 Validation Accuracy:0.620
Epoch:20 Training Loss:0.126 Validation Loss:0.108786
Validation Loss decreased:0.109594 --> 0.108786 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:21 Training Accuracy:0.641 Validation Accuracy:0.664
Epoch:21 Training Loss:0.135 Validation Loss:0.089152
Validation Loss decreased:0.108786 --> 0.089152 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.51it/s]

Epochs:22 Training Accuracy:0.656 Validation Accuracy:0.695
Epoch:22 Training Loss:0.114 Validation Loss:0.080314
Validation Loss decreased:0.089152 --> 0.080314 So saving the model

100%|██████████| 15/15 [00:01<00:00, 9.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.34it/s]

Epochs:23 Training Accuracy:0.652 Validation Accuracy:0.682
Epoch:23 Training Loss:0.108 Validation Loss:0.069456
Validation Loss decreased:0.080314 --> 0.069456 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:24 Training Accuracy:0.667 Validation Accuracy:0.628
Epoch:24 Training Loss:0.101 Validation Loss:0.068857
Validation Loss decreased:0.069456 --> 0.068857 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.69it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:25 Training Accuracy:0.619 Validation Accuracy:0.749
Epoch:25 Training Loss:0.106 Validation Loss:0.062351
Validation Loss decreased:0.068857 --> 0.062351 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:26 Training Accuracy:0.675 Validation Accuracy:0.667
Epoch:26 Training Loss:0.090 Validation Loss:0.058808
Validation Loss decreased:0.062351 --> 0.058808 So saving the model
100%|██████████| 15/15 [00:01<00:00, 8.42it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:27 Training Accuracy:0.666 Validation Accuracy:0.682
Epoch:27 Training Loss:0.086 Validation Loss:0.042367
Validation Loss decreased:0.058808 --> 0.042367 So saving the model
100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.25it/s]

Epochs:28 Training Accuracy:0.673 Validation Accuracy:0.610
Epoch:28 Training Loss:0.090 Validation Loss:0.048475
count patience:1 of 10
100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 20.00it/s]

Epochs:29 Training Accuracy:0.645 Validation Accuracy:0.661
Epoch:29 Training Loss:0.092 Validation Loss:0.057140
count patience:2 of 10
100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:30 Training Accuracy:0.603 Validation Accuracy:0.690
Epoch:30 Training Loss:0.093 Validation Loss:0.053515
count patience:3 of 10
100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:31 Training Accuracy:0.683 Validation Accuracy:0.685
Epoch:31 Training Loss:0.085 Validation Loss:0.054327
count patience:4 of 10
100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:32 Training Accuracy:0.644 Validation Accuracy:0.680
Epoch:32 Training Loss:0.087 Validation Loss:0.050481
count patience:5 of 10
100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:33 Training Accuracy:0.679 Validation Accuracy:0.698
Epoch:33 Training Loss:0.094 Validation Loss:0.061842
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.68it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:34 Training Accuracy:0.657 Validation Accuracy:0.685
Epoch:34 Training Loss:0.088 Validation Loss:0.069033
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:35 Training Accuracy:0.647 Validation Accuracy:0.742
Epoch:35 Training Loss:0.088 Validation Loss:0.046227
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 19.56it/s]

Epochs:36 Training Accuracy:0.682 Validation Accuracy:0.669
Epoch:36 Training Loss:0.082 Validation Loss:0.049106
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:37 Training Accuracy:0.642 Validation Accuracy:0.643
Epoch:37 Training Loss:0.082 Validation Loss:0.038116
Validation Loss decreased:0.042367 --> 0.038116 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:38 Training Accuracy:0.700 Validation Accuracy:0.677
Epoch:38 Training Loss:0.077 Validation Loss:0.040667
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:39 Training Accuracy:0.655 Validation Accuracy:0.566
Epoch:39 Training Loss:0.080 Validation Loss:0.042882
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:40 Training Accuracy:0.655 Validation Accuracy:0.721
Epoch:40 Training Loss:0.079 Validation Loss:0.045424
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.92it/s]

Epochs:41 Training Accuracy:0.666 Validation Accuracy:0.612
Epoch:41 Training Loss:0.090 Validation Loss:0.042790
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]
100%|██████████| 3/3 [00:00<00:00, 21.49it/s]

Epochs:42 Training Accuracy:0.663 Validation Accuracy:0.610

Epoch:42 Training Loss:0.081 Validation Loss:0.042219

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]

100%|██████████| 3/3 [00:00<00:00, 19.35it/s]

Epochs:43 Training Accuracy:0.671 Validation Accuracy:0.643

Epoch:43 Training Loss:0.075 Validation Loss:0.055367

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.38it/s]

Epochs:44 Training Accuracy:0.665 Validation Accuracy:0.698

Epoch:44 Training Loss:0.084 Validation Loss:0.048875

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:45 Training Accuracy:0.627 Validation Accuracy:0.677

Epoch:45 Training Loss:0.082 Validation Loss:0.037391

Validation Loss decreased:0.038116 --> 0.037391 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.77it/s]

Epochs:46 Training Accuracy:0.709 Validation Accuracy:0.674

Epoch:46 Training Loss:0.080 Validation Loss:0.041841

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]

100%|██████████| 3/3 [00:00<00:00, 21.90it/s]

Epochs:47 Training Accuracy:0.685 Validation Accuracy:0.724

Epoch:47 Training Loss:0.081 Validation Loss:0.040068

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]

100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:48 Training Accuracy:0.671 Validation Accuracy:0.651

Epoch:48 Training Loss:0.080 Validation Loss:0.037184

Validation Loss decreased:0.037391 --> 0.037184 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]

100%|██████████| 3/3 [00:00<00:00, 21.26it/s]

Epochs:49 Training Accuracy:0.636 Validation Accuracy:0.726

Epoch:49 Training Loss:0.081 Validation Loss:0.034040

Validation Loss decreased:0.037184 --> 0.034040 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.38it/s]

100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:50 Training Accuracy:0.672 Validation Accuracy:0.729

Epoch:50 Training Loss:0.075 Validation Loss:0.035066

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.89it/s]

Epochs:51 Training Accuracy:0.685 Validation Accuracy:0.711
Epoch:51 Training Loss:0.076 Validation Loss:0.042089
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.93it/s]

Epochs:52 Training Accuracy:0.683 Validation Accuracy:0.667
Epoch:52 Training Loss:0.080 Validation Loss:0.035769
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.89it/s]

Epochs:53 Training Accuracy:0.666 Validation Accuracy:0.667
Epoch:53 Training Loss:0.079 Validation Loss:0.039967
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:54 Training Accuracy:0.669 Validation Accuracy:0.659
Epoch:54 Training Loss:0.073 Validation Loss:0.047469
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:55 Training Accuracy:0.649 Validation Accuracy:0.618
Epoch:55 Training Loss:0.078 Validation Loss:0.039578
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:56 Training Accuracy:0.648 Validation Accuracy:0.654
Epoch:56 Training Loss:0.069 Validation Loss:0.040759
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.27it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:57 Training Accuracy:0.672 Validation Accuracy:0.654
Epoch:57 Training Loss:0.073 Validation Loss:0.038570
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:58 Training Accuracy:0.668 Validation Accuracy:0.695
Epoch:58 Training Loss:0.072 Validation Loss:0.033765
Validation Loss decreased:0.034040 --> 0.033765 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:59 Training Accuracy:0.684 Validation Accuracy:0.724
Epoch:59 Training Loss:0.076 Validation Loss:0.039177
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:60 Training Accuracy:0.634 Validation Accuracy:0.630
Epoch:60 Training Loss:0.077 Validation Loss:0.049964
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:61 Training Accuracy:0.657 Validation Accuracy:0.612
Epoch:61 Training Loss:0.073 Validation Loss:0.039742
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]
100%|██████████| 3/3 [00:00<00:00, 19.37it/s]

Epochs:62 Training Accuracy:0.696 Validation Accuracy:0.638
Epoch:62 Training Loss:0.080 Validation Loss:0.052289
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:63 Training Accuracy:0.653 Validation Accuracy:0.656
Epoch:63 Training Loss:0.074 Validation Loss:0.038896
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.37it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:64 Training Accuracy:0.678 Validation Accuracy:0.739
Epoch:64 Training Loss:0.074 Validation Loss:0.036125
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.59it/s]

Epochs:65 Training Accuracy:0.649 Validation Accuracy:0.682
Epoch:65 Training Loss:0.079 Validation Loss:0.052890
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:66 Training Accuracy:0.669 Validation Accuracy:0.664
Epoch:66 Training Loss:0.075 Validation Loss:0.035998
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:67 Training Accuracy:0.656 Validation Accuracy:0.680
Epoch:67 Training Loss:0.071 Validation Loss:0.040376
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.85it/s]

Epochs:68 Training Accuracy:0.661 Validation Accuracy:0.724
Epoch:68 Training Loss:0.071 Validation Loss:0.039457
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:69 Training Accuracy:0.650 Validation Accuracy:0.630
Epoch:69 Training Loss:0.072 Validation Loss:0.038136
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.0337650366127491
Fold:4

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:1 Training Accuracy:0.501 Validation Accuracy:0.465
Epoch:1 Training Loss:0.999 Validation Loss:0.999642
Validation Loss decreased:inf --> 0.999642 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.38it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:2 Training Accuracy:0.499 Validation Accuracy:0.494
Epoch:2 Training Loss:0.989 Validation Loss:0.984868
Validation Loss decreased:0.999642 --> 0.984868 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:3 Training Accuracy:0.499 Validation Accuracy:0.512
Epoch:3 Training Loss:0.945 Validation Loss:0.908194
Validation Loss decreased:0.984868 --> 0.908194 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:4 Training Accuracy:0.489 Validation Accuracy:0.512
Epoch:4 Training Loss:0.812 Validation Loss:0.688056
Validation Loss decreased:0.908194 --> 0.688056 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:5 Training Accuracy:0.487 Validation Accuracy:0.468
Epoch:5 Training Loss:0.616 Validation Loss:0.488875
Validation Loss decreased:0.688056 --> 0.488875 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:6 Training Accuracy:0.497 Validation Accuracy:0.589
Epoch:6 Training Loss:0.393 Validation Loss:0.254019
Validation Loss decreased:0.488875 --> 0.254019 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.88it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:7 Training Accuracy:0.544 Validation Accuracy:0.563
Epoch:7 Training Loss:0.292 Validation Loss:0.230539
Validation Loss decreased:0.254019 --> 0.230539 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.17it/s]
100%|██████████| 3/3 [00:00<00:00, 21.33it/s]

Epochs:8 Training Accuracy:0.604 Validation Accuracy:0.641
Epoch:8 Training Loss:0.257 Validation Loss:0.199530
Validation Loss decreased:0.230539 --> 0.199530 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:9 Training Accuracy:0.633 Validation Accuracy:0.633
Epoch:9 Training Loss:0.227 Validation Loss:0.204428
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]
100%|██████████| 3/3 [00:00<00:00, 21.83it/s]

Epochs:10 Training Accuracy:0.649 Validation Accuracy:0.602
Epoch:10 Training Loss:0.220 Validation Loss:0.193891
Validation Loss decreased:0.199530 --> 0.193891 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:11 Training Accuracy:0.628 Validation Accuracy:0.641
Epoch:11 Training Loss:0.214 Validation Loss:0.172365
Validation Loss decreased:0.193891 --> 0.172365 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.21it/s]
100%|██████████| 3/3 [00:00<00:00, 19.37it/s]

Epochs:12 Training Accuracy:0.615 Validation Accuracy:0.636
Epoch:12 Training Loss:0.201 Validation Loss:0.181616
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.82it/s]
100%|██████████| 3/3 [00:00<00:00, 21.18it/s]

Epochs:13 Training Accuracy:0.635 Validation Accuracy:0.597
Epoch:13 Training Loss:0.208 Validation Loss:0.174710
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:14 Training Accuracy:0.647 Validation Accuracy:0.633
Epoch:14 Training Loss:0.195 Validation Loss:0.172516
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.36it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:15 Training Accuracy:0.634 Validation Accuracy:0.636
Epoch:15 Training Loss:0.188 Validation Loss:0.146922
Validation Loss decreased:0.172365 --> 0.146922 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:16 Training Accuracy:0.635 Validation Accuracy:0.646
Epoch:16 Training Loss:0.181 Validation Loss:0.154335
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:17 Training Accuracy:0.658 Validation Accuracy:0.674
Epoch:17 Training Loss:0.169 Validation Loss:0.137658
Validation Loss decreased:0.146922 --> 0.137658 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.09it/s]

Epochs:18 Training Accuracy:0.647 Validation Accuracy:0.568
Epoch:18 Training Loss:0.158 Validation Loss:0.121894
Validation Loss decreased:0.137658 --> 0.121894 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.65it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:19 Training Accuracy:0.652 Validation Accuracy:0.677
Epoch:19 Training Loss:0.159 Validation Loss:0.109725
Validation Loss decreased:0.121894 --> 0.109725 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:20 Training Accuracy:0.620 Validation Accuracy:0.641
Epoch:20 Training Loss:0.147 Validation Loss:0.120525
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.39it/s]
100%|██████████| 3/3 [00:00<00:00, 21.64it/s]

Epochs:21 Training Accuracy:0.675 Validation Accuracy:0.594
Epoch:21 Training Loss:0.137 Validation Loss:0.099687
Validation Loss decreased:0.109725 --> 0.099687 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.72it/s]

Epochs:22 Training Accuracy:0.694 Validation Accuracy:0.633
Epoch:22 Training Loss:0.124 Validation Loss:0.087022
Validation Loss decreased:0.099687 --> 0.087022 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:23 Training Accuracy:0.685 Validation Accuracy:0.597
Epoch:23 Training Loss:0.113 Validation Loss:0.080626
Validation Loss decreased:0.087022 --> 0.080626 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:24 Training Accuracy:0.638 Validation Accuracy:0.726
Epoch:24 Training Loss:0.107 Validation Loss:0.072753
Validation Loss decreased:0.080626 --> 0.072753 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.57it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:25 Training Accuracy:0.660 Validation Accuracy:0.695
Epoch:25 Training Loss:0.114 Validation Loss:0.067379
Validation Loss decreased:0.072753 --> 0.067379 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.73it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:26 Training Accuracy:0.682 Validation Accuracy:0.628
Epoch:26 Training Loss:0.092 Validation Loss:0.057981
Validation Loss decreased:0.067379 --> 0.057981 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]
100%|██████████| 3/3 [00:00<00:00, 19.64it/s]

Epochs:27 Training Accuracy:0.658 Validation Accuracy:0.654
Epoch:27 Training Loss:0.089 Validation Loss:0.057325
Validation Loss decreased:0.057981 --> 0.057325 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:28 Training Accuracy:0.636 Validation Accuracy:0.690
Epoch:28 Training Loss:0.101 Validation Loss:0.047328
Validation Loss decreased:0.057325 --> 0.047328 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:29 Training Accuracy:0.678 Validation Accuracy:0.711
Epoch:29 Training Loss:0.084 Validation Loss:0.046995
Validation Loss decreased:0.047328 --> 0.046995 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 18.24it/s]

Epochs:30 Training Accuracy:0.639 Validation Accuracy:0.512
Epoch:30 Training Loss:0.087 Validation Loss:0.046265
Validation Loss decreased:0.046995 --> 0.046265 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.03it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:31 Training Accuracy:0.668 Validation Accuracy:0.669
Epoch:31 Training Loss:0.084 Validation Loss:0.056245
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:32 Training Accuracy:0.672 Validation Accuracy:0.724
Epoch:32 Training Loss:0.086 Validation Loss:0.047048
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:33 Training Accuracy:0.638 Validation Accuracy:0.618
Epoch:33 Training Loss:0.085 Validation Loss:0.053861
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:34 Training Accuracy:0.654 Validation Accuracy:0.724
Epoch:34 Training Loss:0.096 Validation Loss:0.040898
Validation Loss decreased:0.046265 --> 0.040898 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.73it/s]

Epochs:35 Training Accuracy:0.681 Validation Accuracy:0.643
Epoch:35 Training Loss:0.086 Validation Loss:0.043453
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.93it/s]

Epochs:36 Training Accuracy:0.679 Validation Accuracy:0.664
Epoch:36 Training Loss:0.078 Validation Loss:0.046248
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.63it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:37 Training Accuracy:0.673 Validation Accuracy:0.628
Epoch:37 Training Loss:0.084 Validation Loss:0.042986
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:38 Training Accuracy:0.641 Validation Accuracy:0.721
Epoch:38 Training Loss:0.080 Validation Loss:0.039352
Validation Loss decreased:0.040898 --> 0.039352 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.58it/s]

Epochs:39 Training Accuracy:0.625 Validation Accuracy:0.643
Epoch:39 Training Loss:0.076 Validation Loss:0.036725
Validation Loss decreased:0.039352 --> 0.036725 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 19.50it/s]

Epochs:40 Training Accuracy:0.670 Validation Accuracy:0.659
Epoch:40 Training Loss:0.086 Validation Loss:0.039446
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.70it/s]
100%|██████████| 3/3 [00:00<00:00, 21.55it/s]

Epochs:41 Training Accuracy:0.699 Validation Accuracy:0.682
Epoch:41 Training Loss:0.077 Validation Loss:0.035104
Validation Loss decreased:0.036725 --> 0.035104 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.59it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:42 Training Accuracy:0.640 Validation Accuracy:0.695
Epoch:42 Training Loss:0.085 Validation Loss:0.047540
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:43 Training Accuracy:0.679 Validation Accuracy:0.661
Epoch:43 Training Loss:0.077 Validation Loss:0.039277
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.29it/s]

Epochs:44 Training Accuracy:0.682 Validation Accuracy:0.690
Epoch:44 Training Loss:0.090 Validation Loss:0.041800
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:45 Training Accuracy:0.643 Validation Accuracy:0.646
Epoch:45 Training Loss:0.081 Validation Loss:0.040017
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 20.97it/s]

Epochs:46 Training Accuracy:0.665 Validation Accuracy:0.690
Epoch:46 Training Loss:0.084 Validation Loss:0.042857
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.31it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:47 Training Accuracy:0.673 Validation Accuracy:0.682
Epoch:47 Training Loss:0.083 Validation Loss:0.036424
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.74it/s]

Epochs:48 Training Accuracy:0.627 Validation Accuracy:0.661
Epoch:48 Training Loss:0.075 Validation Loss:0.032944
Validation Loss decreased:0.035104 --> 0.032944 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.18it/s]

Epochs:49 Training Accuracy:0.666 Validation Accuracy:0.690
Epoch:49 Training Loss:0.082 Validation Loss:0.034945
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 18.93it/s]

Epochs:50 Training Accuracy:0.629 Validation Accuracy:0.594
Epoch:50 Training Loss:0.083 Validation Loss:0.042847
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.55it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:51 Training Accuracy:0.668 Validation Accuracy:0.685
Epoch:51 Training Loss:0.075 Validation Loss:0.041067
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.75it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:52 Training Accuracy:0.674 Validation Accuracy:0.705
Epoch:52 Training Loss:0.076 Validation Loss:0.034292
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:53 Training Accuracy:0.674 Validation Accuracy:0.630
Epoch:53 Training Loss:0.078 Validation Loss:0.038805
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.50it/s]
100%|██████████| 3/3 [00:00<00:00, 21.62it/s]

Epochs:54 Training Accuracy:0.673 Validation Accuracy:0.659
Epoch:54 Training Loss:0.086 Validation Loss:0.036475
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.76it/s]

Epochs:55 Training Accuracy:0.641 Validation Accuracy:0.687
Epoch:55 Training Loss:0.080 Validation Loss:0.040746
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:56 Training Accuracy:0.678 Validation Accuracy:0.636
Epoch:56 Training Loss:0.082 Validation Loss:0.040687
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:57 Training Accuracy:0.667 Validation Accuracy:0.581
Epoch:57 Training Loss:0.076 Validation Loss:0.051940
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:58 Training Accuracy:0.685 Validation Accuracy:0.690
Epoch:58 Training Loss:0.080 Validation Loss:0.036069
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.75it/s]

Epochs:59 Training Accuracy:0.656 Validation Accuracy:0.646
Epoch:59 Training Loss:0.083 Validation Loss:0.045707
count patience:11 of 10

Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.03294358029961586
Fold:5

100%|██████████| 15/15 [00:01<00:00, 10.93it/s]
100%|██████████| 3/3 [00:00<00:00, 21.79it/s]

Epochs:1 Training Accuracy:0.504 Validation Accuracy:0.532
Epoch:1 Training Loss:0.999 Validation Loss:0.999717
Validation Loss decreased:inf --> 0.999717 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]
100%|██████████| 3/3 [00:00<00:00, 21.25it/s]

Epochs:2 Training Accuracy:0.497 Validation Accuracy:0.499
Epoch:2 Training Loss:0.990 Validation Loss:0.989568
Validation Loss decreased:0.999717 --> 0.989568 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.86it/s]
100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:3 Training Accuracy:0.498 Validation Accuracy:0.522
Epoch:3 Training Loss:0.948 Validation Loss:0.923280
Validation Loss decreased:0.989568 --> 0.923280 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:4 Training Accuracy:0.510 Validation Accuracy:0.486
Epoch:4 Training Loss:0.824 Validation Loss:0.739252
Validation Loss decreased:0.923280 --> 0.739252 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.90it/s]
100%|██████████| 3/3 [00:00<00:00, 21.93it/s]

Epochs:5 Training Accuracy:0.484 Validation Accuracy:0.494
Epoch:5 Training Loss:0.632 Validation Loss:0.548812
Validation Loss decreased:0.739252 --> 0.548812 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.87it/s]
100%|██████████| 3/3 [00:00<00:00, 21.81it/s]

Epochs:6 Training Accuracy:0.538 Validation Accuracy:0.558
Epoch:6 Training Loss:0.407 Validation Loss:0.740865
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.89it/s]
100%|██████████| 3/3 [00:00<00:00, 21.14it/s]

Epochs:7 Training Accuracy:0.574 Validation Accuracy:0.674
Epoch:7 Training Loss:0.287 Validation Loss:0.303095
Validation Loss decreased:0.548812 --> 0.303095 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.93it/s]
100%|██████████| 3/3 [00:00<00:00, 20.60it/s]

Epochs:8 Training Accuracy:0.602 Validation Accuracy:0.605
Epoch:8 Training Loss:0.247 Validation Loss:1.327380
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.40it/s]
100%|██████████| 3/3 [00:00<00:00, 21.82it/s]

Epochs:9 Training Accuracy:0.625 Validation Accuracy:0.667
Epoch:9 Training Loss:0.234 Validation Loss:0.198122
Validation Loss decreased:0.303095 --> 0.198122 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.84it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:10 Training Accuracy:0.627 Validation Accuracy:0.623
Epoch:10 Training Loss:0.221 Validation Loss:1.126092
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 18.37it/s]

Epochs:11 Training Accuracy:0.653 Validation Accuracy:0.651
Epoch:11 Training Loss:0.222 Validation Loss:1.099611
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.25it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:12 Training Accuracy:0.620 Validation Accuracy:0.602

Epoch:12 Training Loss:0.211 Validation Loss:0.230671

count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.85it/s]

100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:13 Training Accuracy:0.619 Validation Accuracy:0.656

Epoch:13 Training Loss:0.212 Validation Loss:0.211800

count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:14 Training Accuracy:0.641 Validation Accuracy:0.711

Epoch:14 Training Loss:0.195 Validation Loss:0.971839

count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.83it/s]

100%|██████████| 3/3 [00:00<00:00, 15.61it/s]

Epochs:15 Training Accuracy:0.621 Validation Accuracy:0.687

Epoch:15 Training Loss:0.189 Validation Loss:0.859443

count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.52it/s]

100%|██████████| 3/3 [00:00<00:00, 21.63it/s]

Epochs:16 Training Accuracy:0.670 Validation Accuracy:0.630

Epoch:16 Training Loss:0.177 Validation Loss:0.941376

count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]

100%|██████████| 3/3 [00:00<00:00, 21.86it/s]

Epochs:17 Training Accuracy:0.654 Validation Accuracy:0.654

Epoch:17 Training Loss:0.149 Validation Loss:0.189141

Validation Loss decreased:0.198122 --> 0.189141 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.80it/s]

Epochs:18 Training Accuracy:0.661 Validation Accuracy:0.628

Epoch:18 Training Loss:0.141 Validation Loss:0.090118

Validation Loss decreased:0.189141 --> 0.090118 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]

100%|██████████| 3/3 [00:00<00:00, 21.54it/s]

Epochs:19 Training Accuracy:0.643 Validation Accuracy:0.705

Epoch:19 Training Loss:0.126 Validation Loss:2.479246

count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 20.77it/s]

Epochs:20 Training Accuracy:0.650 Validation Accuracy:0.734

Epoch:20 Training Loss:0.105 Validation Loss:0.293273

count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]

100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:21 Training Accuracy:0.650 Validation Accuracy:0.729
Epoch:21 Training Loss:0.089 Validation Loss:0.318336
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.47it/s]
100%|██████████| 3/3 [00:00<00:00, 19.04it/s]

Epochs:22 Training Accuracy:0.655 Validation Accuracy:0.610
Epoch:22 Training Loss:0.092 Validation Loss:4.024460
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 21.68it/s]

Epochs:23 Training Accuracy:0.659 Validation Accuracy:0.703
Epoch:23 Training Loss:0.085 Validation Loss:3.645211
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:24 Training Accuracy:0.667 Validation Accuracy:0.716
Epoch:24 Training Loss:0.081 Validation Loss:3.629056
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.81it/s]
100%|██████████| 3/3 [00:00<00:00, 21.87it/s]

Epochs:25 Training Accuracy:0.662 Validation Accuracy:0.690
Epoch:25 Training Loss:0.090 Validation Loss:0.283539
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.80it/s]
100%|██████████| 3/3 [00:00<00:00, 21.69it/s]

Epochs:26 Training Accuracy:0.635 Validation Accuracy:0.594
Epoch:26 Training Loss:0.084 Validation Loss:3.398033
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.71it/s]

Epochs:27 Training Accuracy:0.662 Validation Accuracy:0.695
Epoch:27 Training Loss:0.077 Validation Loss:0.045139
Validation Loss decreased:0.090118 --> 0.045139 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.61it/s]

Epochs:28 Training Accuracy:0.637 Validation Accuracy:0.607
Epoch:28 Training Loss:0.084 Validation Loss:3.720685
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.51it/s]
100%|██████████| 3/3 [00:00<00:00, 19.66it/s]

Epochs:29 Training Accuracy:0.660 Validation Accuracy:0.615
Epoch:29 Training Loss:0.083 Validation Loss:0.279705
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:30 Training Accuracy:0.697 Validation Accuracy:0.669
Epoch:30 Training Loss:0.082 Validation Loss:3.697625
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.71it/s]
100%|██████████| 3/3 [00:00<00:00, 17.99it/s]

Epochs:31 Training Accuracy:0.680 Validation Accuracy:0.651
Epoch:31 Training Loss:0.077 Validation Loss:0.290837
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.07it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:32 Training Accuracy:0.659 Validation Accuracy:0.620
Epoch:32 Training Loss:0.082 Validation Loss:3.418856
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.70it/s]

Epochs:33 Training Accuracy:0.670 Validation Accuracy:0.736
Epoch:33 Training Loss:0.080 Validation Loss:3.857739
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.50it/s]

Epochs:34 Training Accuracy:0.673 Validation Accuracy:0.713
Epoch:34 Training Loss:0.078 Validation Loss:3.476958
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:35 Training Accuracy:0.676 Validation Accuracy:0.664
Epoch:35 Training Loss:0.077 Validation Loss:3.553334
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.38it/s]
100%|██████████| 3/3 [00:00<00:00, 19.34it/s]

Epochs:36 Training Accuracy:0.638 Validation Accuracy:0.783
Epoch:36 Training Loss:0.076 Validation Loss:0.041687
Validation Loss decreased:0.045139 --> 0.041687 So saving the model

100%|██████████| 15/15 [00:01<00:00, 10.62it/s]
100%|██████████| 3/3 [00:00<00:00, 20.66it/s]

Epochs:37 Training Accuracy:0.676 Validation Accuracy:0.599
Epoch:37 Training Loss:0.079 Validation Loss:3.620398
count patience:1 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.46it/s]

Epochs:38 Training Accuracy:0.619 Validation Accuracy:0.579
Epoch:38 Training Loss:0.084 Validation Loss:3.565588
count patience:2 of 10

100%|██████████| 15/15 [00:01<00:00, 10.78it/s]
100%|██████████| 3/3 [00:00<00:00, 21.66it/s]

Epochs:39 Training Accuracy:0.640 Validation Accuracy:0.705
Epoch:39 Training Loss:0.081 Validation Loss:3.234275
count patience:3 of 10

100%|██████████| 15/15 [00:01<00:00, 10.77it/s]
100%|██████████| 3/3 [00:00<00:00, 21.43it/s]

Epochs:40 Training Accuracy:0.649 Validation Accuracy:0.664
Epoch:40 Training Loss:0.082 Validation Loss:0.271569
count patience:4 of 10

100%|██████████| 15/15 [00:01<00:00, 10.67it/s]
100%|██████████| 3/3 [00:00<00:00, 21.65it/s]

Epochs:41 Training Accuracy:0.630 Validation Accuracy:0.749
Epoch:41 Training Loss:0.074 Validation Loss:0.042648
count patience:5 of 10

100%|██████████| 15/15 [00:01<00:00, 10.74it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:42 Training Accuracy:0.643 Validation Accuracy:0.700
Epoch:42 Training Loss:0.078 Validation Loss:3.408965
count patience:6 of 10

100%|██████████| 15/15 [00:01<00:00, 10.36it/s]
100%|██████████| 3/3 [00:00<00:00, 20.98it/s]

Epochs:43 Training Accuracy:0.676 Validation Accuracy:0.563
Epoch:43 Training Loss:0.077 Validation Loss:3.457877
count patience:7 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.53it/s]

Epochs:44 Training Accuracy:0.665 Validation Accuracy:0.703
Epoch:44 Training Loss:0.084 Validation Loss:3.538383
count patience:8 of 10

100%|██████████| 15/15 [00:01<00:00, 10.72it/s]
100%|██████████| 3/3 [00:00<00:00, 21.78it/s]

Epochs:45 Training Accuracy:0.651 Validation Accuracy:0.550
Epoch:45 Training Loss:0.080 Validation Loss:3.861106
count patience:9 of 10

100%|██████████| 15/15 [00:01<00:00, 10.79it/s]
100%|██████████| 3/3 [00:00<00:00, 21.57it/s]

Epochs:46 Training Accuracy:0.647 Validation Accuracy:0.584
Epoch:46 Training Loss:0.076 Validation Loss:3.739702
count patience:10 of 10

100%|██████████| 15/15 [00:01<00:00, 10.76it/s]
100%|██████████| 3/3 [00:00<00:00, 21.67it/s]

Epochs:47 Training Accuracy:0.660 Validation Accuracy:0.674
Epoch:47 Training Loss:0.079 Validation Loss:3.956708
count patience:11 of 10
Meet Early Stopper so End Training...
And best Valid MAPE Loss:0.04168729856610298

Train Result

In [81]:

```
def plot_loss(name,train_loss,val_loss):
    plt.figure(figsize=(20,10))
    plt.plot(train_loss,label='train_MAPE')
    plt.plot(val_loss,label='valid_MAPE')
    plt.title(name)
    plt.legend()
    plt.grid(True)
    return plt.show()
```

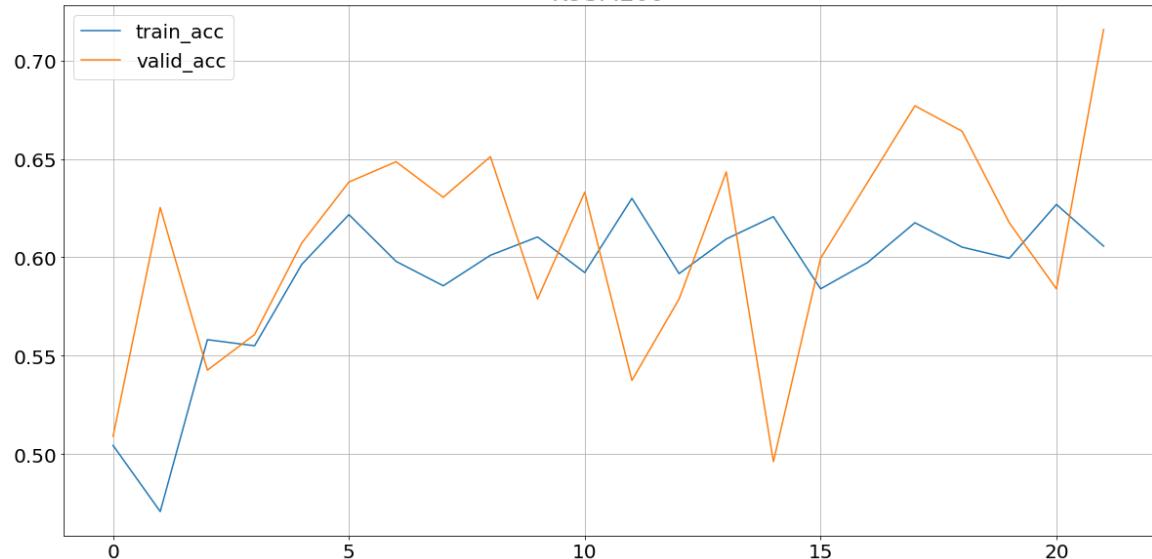
In [82]:

```
def plot_acc(name,train_acc,val_acc):
    plt.figure(figsize=(20,10))
    plt.plot(train_acc,label='train_acc')
    plt.plot(val_acc,label='valid_acc')
    plt.title(name)
    plt.legend()
    plt.grid(True)
    return plt.show()
```

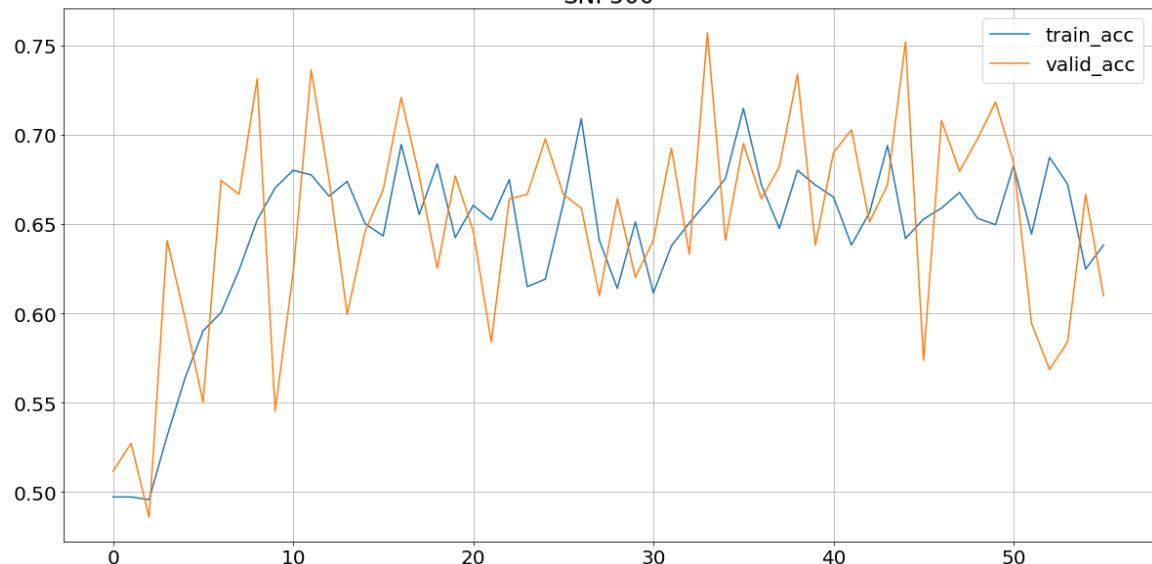
In [83]:

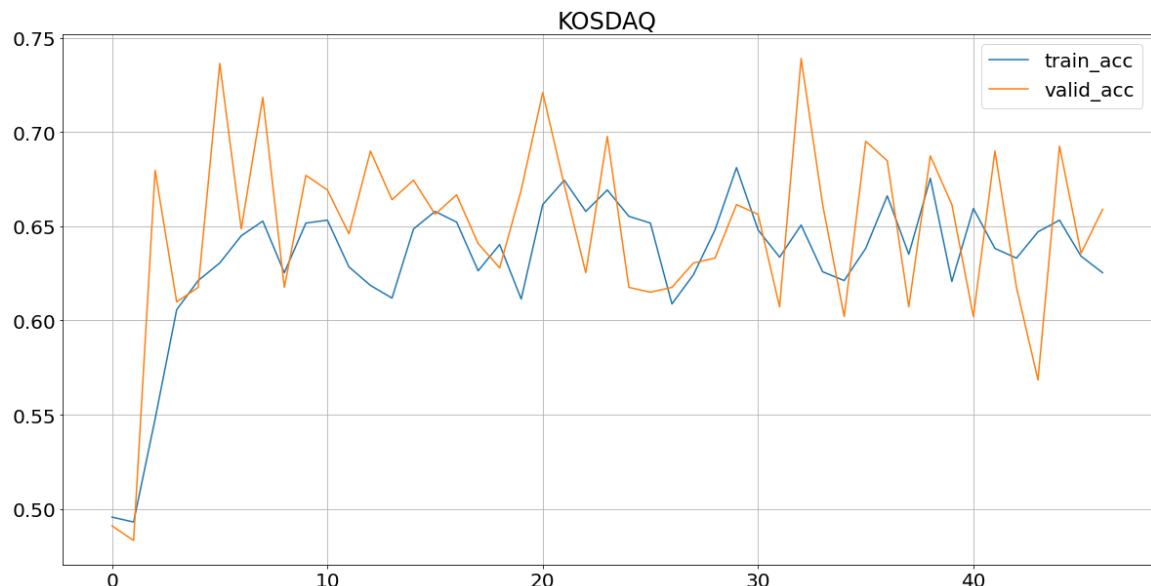
```
plot_acc('KOSPI200',KOSPI200_train_acc,KOSPI200_valid_acc)
plot_acc('SNP500',SNP500_train_acc,SNP500_valid_acc)
plot_acc('KOSDAQ',KOSDAQ_train_acc,KOSDAQ_valid_acc)
plot_acc('NASDAQ',NASDAQ_train_acc,NASDAQ_valid_acc)
plot_acc('US30',US30_train_acc,US30_valid_acc)
```

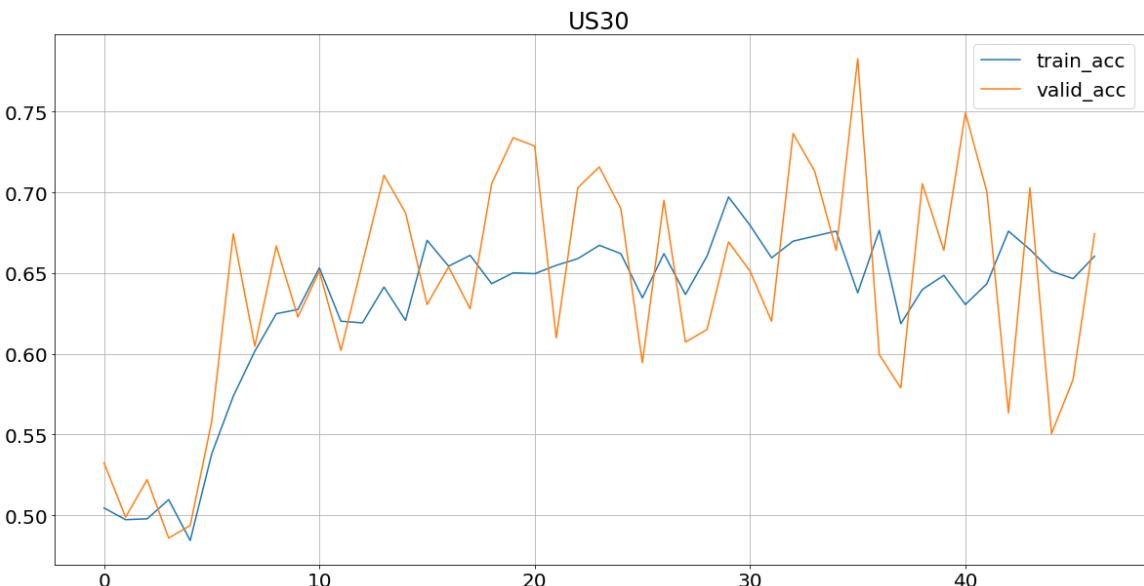
KOSPI200



SNP500



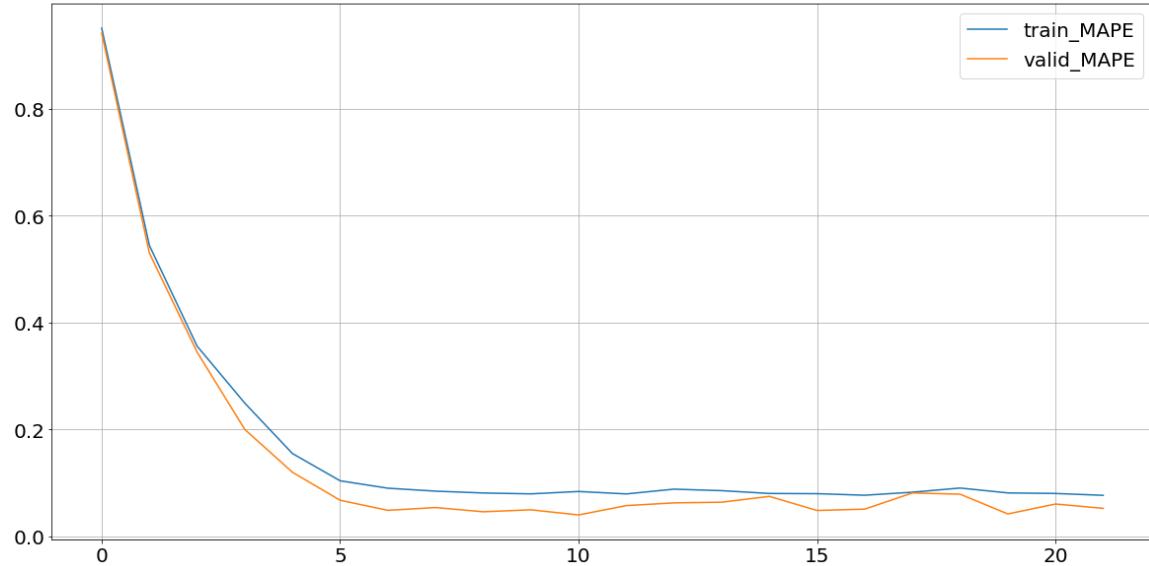




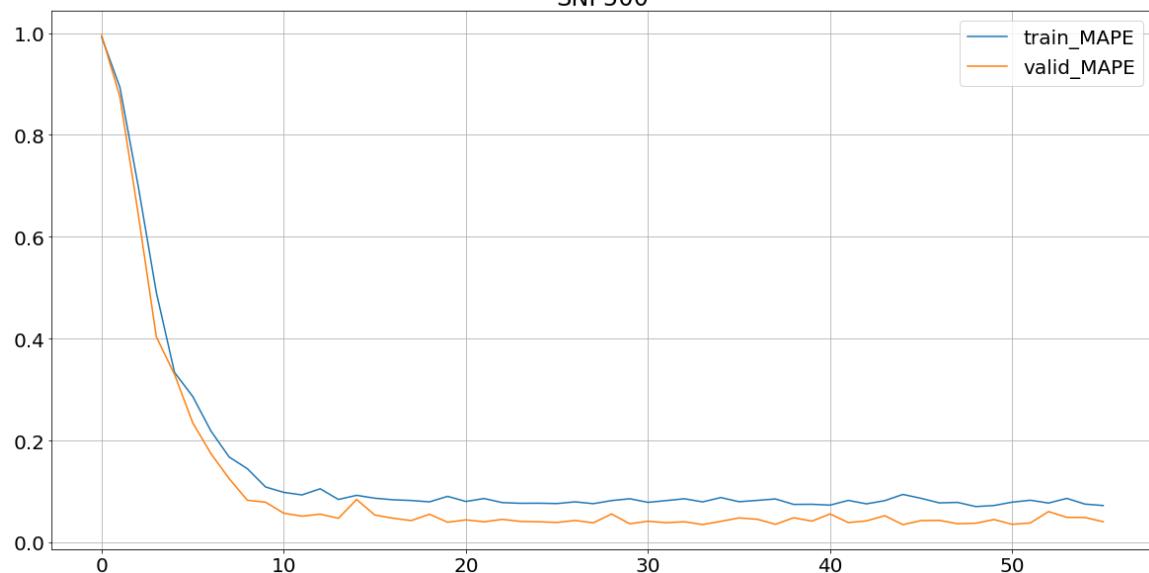
In [84]:

```
plot_loss('KOSPI200',KOSPI200_train_loss,KOSPI200_valid_loss)
plot_loss('SNP500',SNP500_train_loss,SNP500_valid_loss)
plot_loss('KOSDAQ',KOSDAQ_train_loss,KOSDAQ_valid_loss)
plot_loss('NASDAQ',NASDAQ_train_loss,NASDAQ_valid_loss)
plot_loss('US30',US30_train_loss,US30_valid_loss)
```

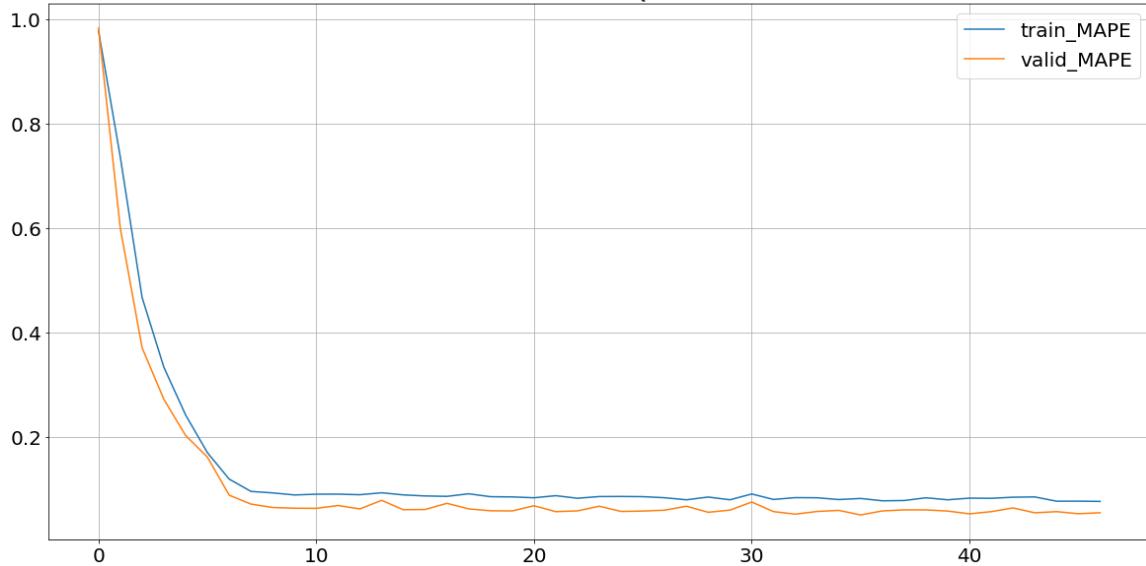
KOSPI200



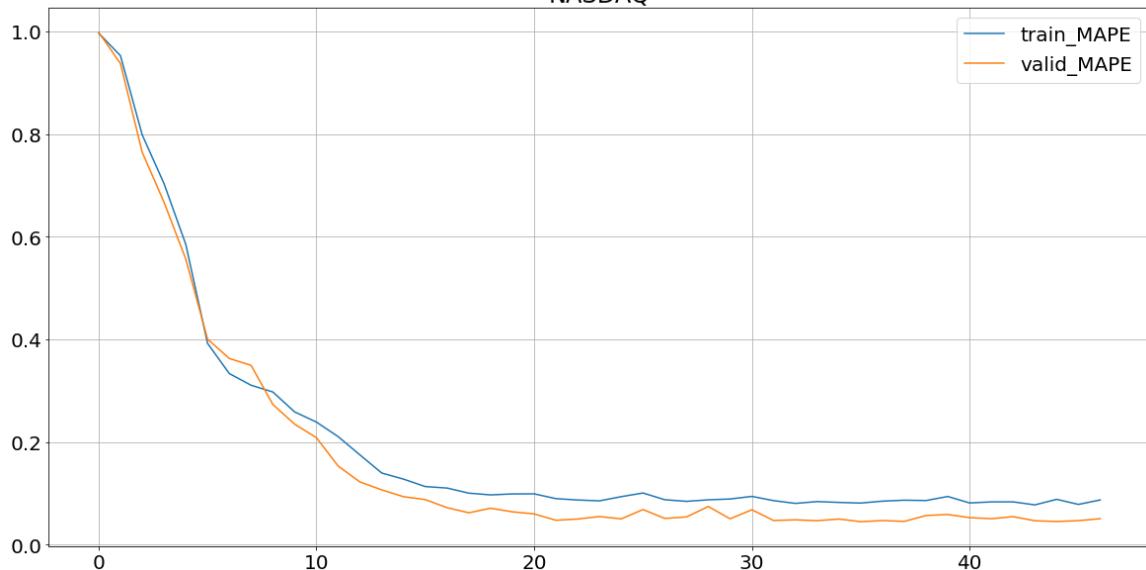
SNP500

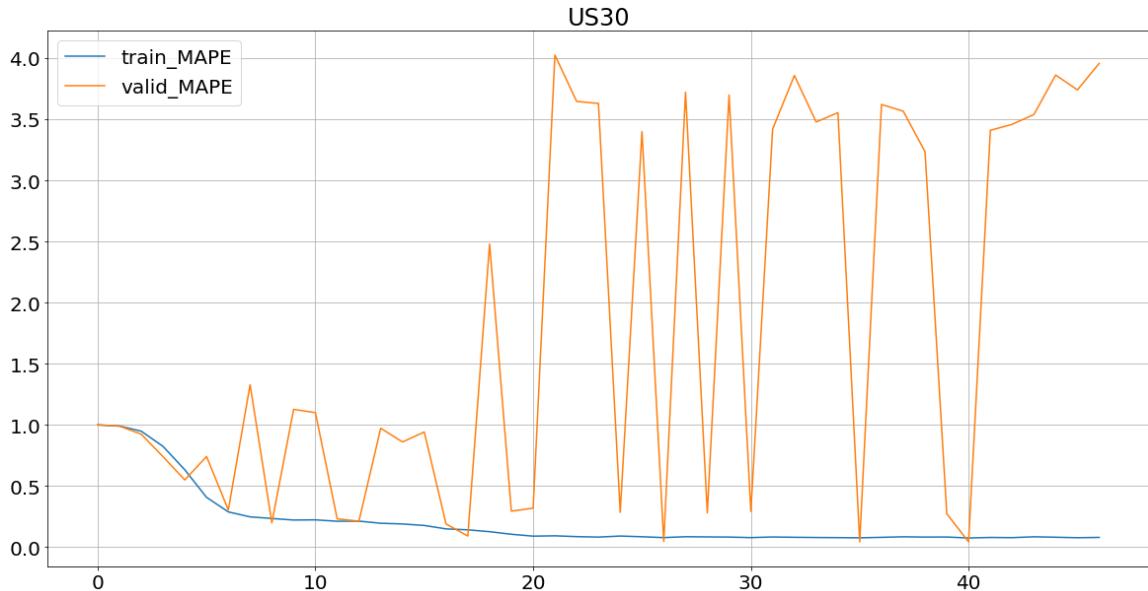


KOSDAQ



NASDAQ





In [85]:

```
KOSPI200_test_loader = DataLoader(KOSPI200_test_set,batch_size=len(KOSPI200_test_set),num_workers=0)
SNP500_test_loader = DataLoader(SNP500_test_set,batch_size=len(SNP500_test_set),num_workers=0)
KOSDAQ_test_loader = DataLoader(KOSDAQ_test_set,batch_size=len(KOSDAQ_test_set),num_workers=0)
NASDAQ_test_loader = DataLoader(NASDAQ_test_set,batch_size=len(NASDAQ_test_set),num_workers=0)
US30_test_loader = DataLoader(US30_test_set,batch_size=len(US30_test_set),num_workers=0)
```

In [86]:

```
def eval_model(stock_name,model_name,loader):
    ensemble_pred = []
    for i in range(5):
        device = ('cuda' if torch.cuda.is_available() else 'cpu')
        model = torch.load(f'./{stock_name}_{model_name}_{i}.pt')
        model.to(device)
        model.eval()
        with torch.no_grad():
            for data in loader:
                data = data.to(device).float()
                pred = model(data).detach().cpu().numpy()
                ensemble_pred.append(pred)
    pred = np.mean(ensemble_pred, axis=0)
    return pred
```

CNN2GRU_eval

In [87]:

```
deep_KOSPI200_pred = eval_model('KOSPI200','CNN2GRU',KOSPI200_test_loader)
deep_SNP500_pred = eval_model('SNP500','CNN2GRU',SNP500_test_loader)
deep_KOSDAQ_pred = eval_model('KOSDAQ','CNN2GRU',KOSDAQ_test_loader)
deep_NASDAQ_pred = eval_model('NASDAQ','CNN2GRU',NASDAQ_test_loader)
deep_US30_pred = eval_model('US30','CNN2GRU',US30_test_loader)
```

Ensemble

In [88]:

```
Deep_KOSPI200_pred = make_datetime(deep_KOSPI200_pred)
Deep_SNP500_pred = make_datetime(deep_SNP500_pred)
Deep_KOSDAQ_pred = make_datetime(deep_KOSDAQ_pred)
Deep_NASDAQ_pred = make_datetime(deep_NASDAQ_pred)
Deep_US30_pred = make_datetime(deep_US30_pred)
```

In [89]:

```
KOSPI200_ensemble = (Deep_KOSPI200_pred+ML_KOSPI200_pred)/2
SNP500_ensemble = (Deep_SNP500_pred+ML_SNP500_pred)/2
KOSDAQ_ensemble = (Deep_KOSDAQ_pred+ML_KOSDAQ_pred)/2
NASDAQ_ensemble = (Deep_NASDAQ_pred+ML_NASDAQ_pred)/2
US30_ensemble = (Deep_US30_pred+ML_US30_pred)/2
```

In [90]:

```
def indices_binarizer(target,prediction):
    target_result = []
    prediction_result = []
    for i,indices in enumerate(target.Close):
        if i == 0:
            target_result.append(0)
            data = indices
        if indices >= data:
            pred = 1
            target_result.append(pred)
            data = indices
        if indices < data:
            pred = 0
            target_result.append(pred)
            data = indices
    for i,indices in enumerate(prediction.pred):
        if i == 0:
            prediction_result.append(0)
            pred_data = indices
        if indices >= data:
            pred = 1
            prediction_result.append(pred)
            pred_data = indices
        if indices < data:
            pred = 0
            prediction_result.append(pred)
            pred_data = indices
    return target_result, prediction_result
```

In [91]:

```
def print_result(pred):
    pred = pred.reset_index()
    high = pred.pred.max()
    low = pred.pred.min()
    for i in pred.values:
        if high == i[1:2]:
            high_date = i[:1]
        elif low == i[1:2]:
            low_date = i[:1]
        else:
            pass
        if high_date < low_date:
            return print(f'You have short position {high_date} may be Price:{high}\nsell position
in {low_date} may be price:{low}')
        elif high_date > low_date:
            return print(f'You have long position {low_date} may be Price:{low}\nsell position in
{high_date} may be price:{high}')
        else:
            pass
```

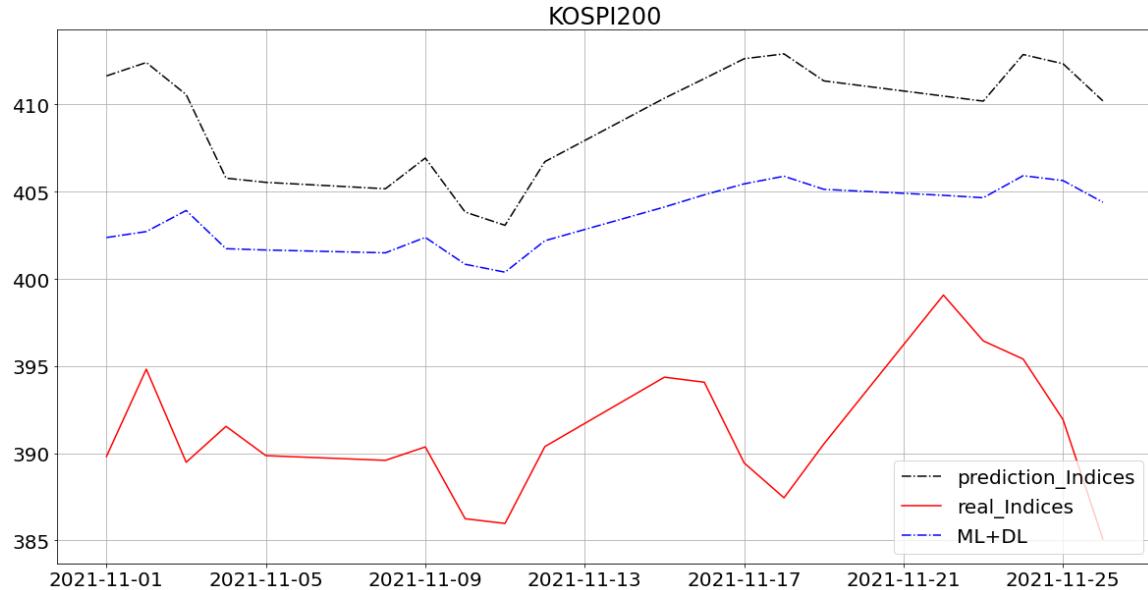
Plot result

In [92]:

```
def final_plot_result(stock_name,real_indices,pred,ensemble_pred):
    plt.figure(figsize=(20,10))
    plt.rc('font',size=20)
    plt.title(stock_name)
    plt.plot(pred,ls='-.',label='prediction_indices',color='black')
    plt.plot(real_indices,label='real_indices',color='red')
    plt.plot(ensemble_pred,label='ML+DL',ls='-.',color='blue')
    plt.legend(loc='lower right')
    plt.grid()
    return plt.show()
```

In [93]:

```
final_plot_result('KOSPI200',real_KOSPI200,Deep_KOSPI200_pred,KOSPI200_ensemble)
```



In [94]:

```
print_result(Deep_KOSPI200_pred)
```

You have long position [Timestamp('2021-11-11 00:00:00')] may be Price:403.0720825
1953125
sell position in [Timestamp('2021-11-18 00:00:00')] may be price:412.9038696289062
5

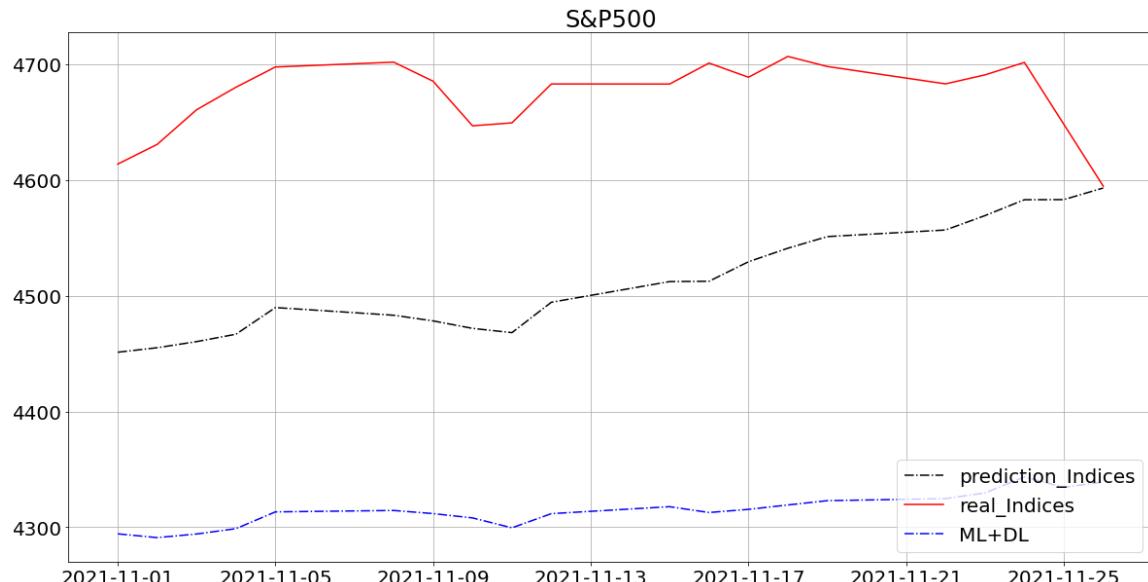
In [95]:

```
KOSPI200_binary,KOSPI200_binary_pred = indices_binarizer(real_KOSPI200,Deep_KOSPI200_pred)  
print(f'Accuracy score:{accuracy_score(KOSPI200_binary,KOSPI200_binary_pred)}')
```

Accuracy score:0.42857142857142855

In [96]:

```
final_plot_result('S&P500',real_SNP500,Deep_SNP500_pred,SNP500_ensemble)
```



In [97]:

```
print_result(Deep_SNP500_pred)
```

You have long position [Timestamp('2021-11-01 00:00:00')] may be Price:4451.142578
125
sell position in [Timestamp('2021-11-26 00:00:00')] may be price:4593.0029296875

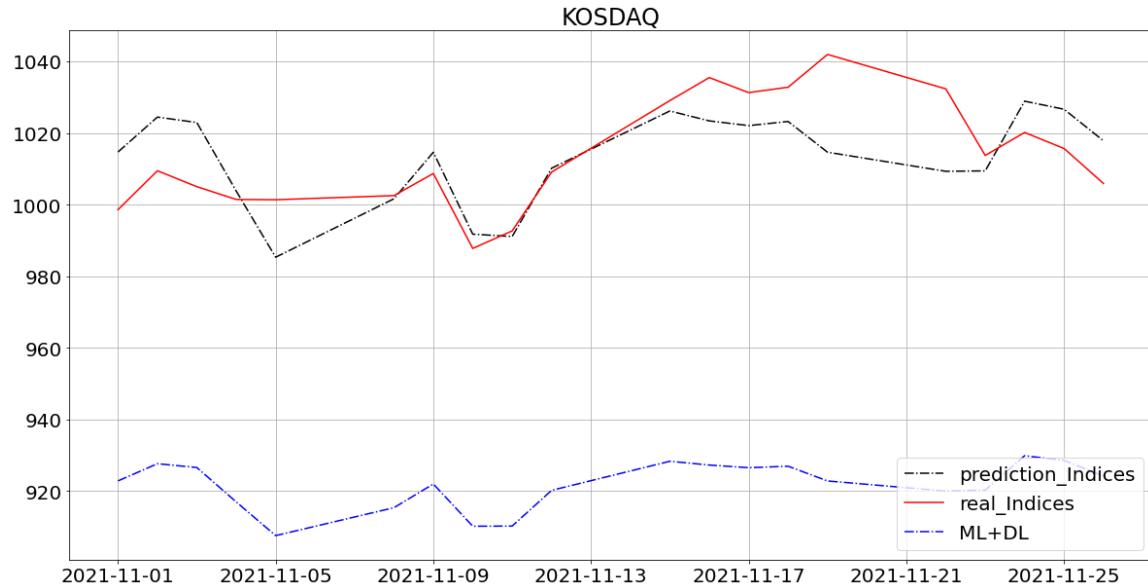
In [98]:

```
SNP500_binary,SNP500_binary_pred= indices_binarizer(real_SNP500,Deep_SNP500_pred.drop(Deep_SNP500_pred.index[18]))  
print(f'Accuracy score:{accuracy_score(SNP500_binary,SNP500_binary_pred)}')
```

Accuracy score:0.4

In [99]:

```
final_plot_result('KOSDAQ',real_KOSDAQ,Deep_KOSDAQ_pred,KOSDAQ_ensemble)
```



In [100]:

```
print_result(Deep_KOSDAQ_pred)
```

You have long position [Timestamp('2021-11-05 00:00:00')] may be Price:985.2996215
820312
sell position in [Timestamp('2021-11-24 00:00:00')] may be price:1028.869873046875

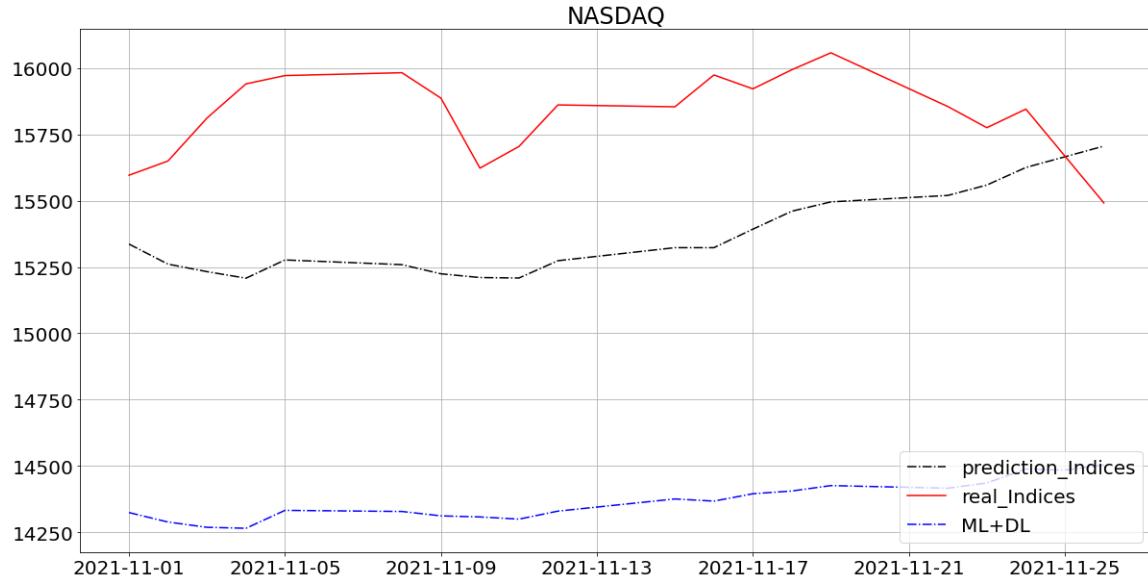
In [101]:

```
KOSDAQ_binary,KOSDAQ_binary_pred = indices_binarizer(real_KOSDAQ,Deep_KOSDAQ_pred)  
print(f'Accuracy score:{accuracy_score(KOSDAQ_binary,KOSDAQ_binary_pred)}')
```

Accuracy score:0.6190476190476191

In [102]:

```
final_plot_result('NASDAQ',real_NASDAQ,Deep_NASDAQ_pred,NASDAQ_ensemble)
```



In [103]:

```
print_result(Deep_NASDAQ_pred)
```

You have long position [Timestamp('2021-11-04 00:00:00')] may be Price:15207.83300
78125
sell position in [Timestamp('2021-11-26 00:00:00')] may be price:15705.7158203125

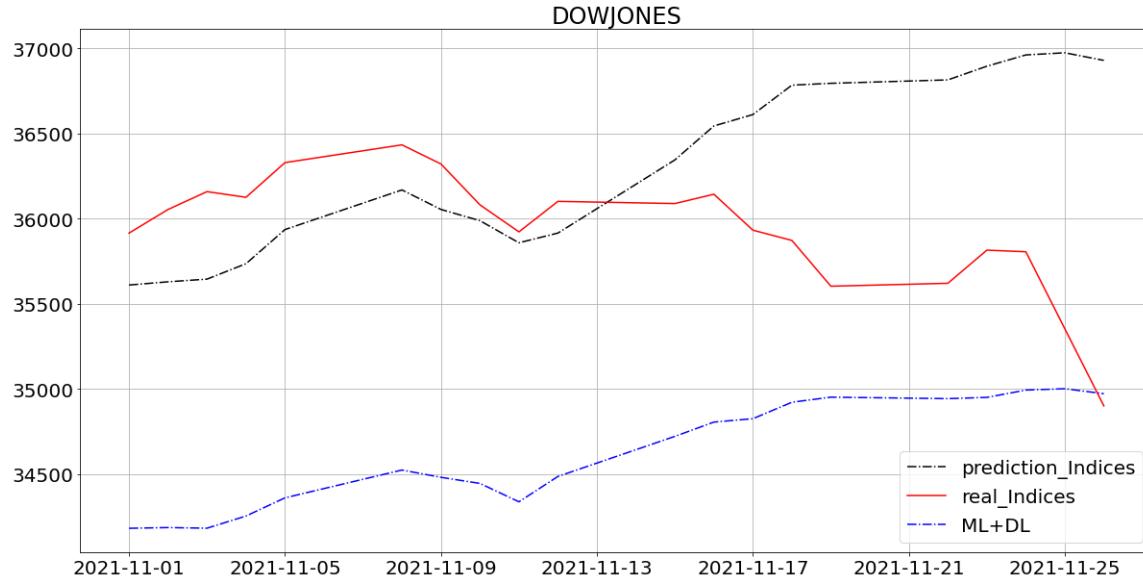
In [104]:

```
NASDAQ_binary,NASDAQ_binary_pred = indices_binarizer(real_NASDAQ,Deep_NASDAQ_pred.drop(Deep_NASDAQ_pred.index[18]))  
print(f'Accuracy score:{accuracy_score(NASDAQ_binary,NASDAQ_binary_pred)}')
```

Accuracy score:0.35

In [105]:

```
final_plot_result('DOWJONES',real_US30,Deep_US30_pred,US30_ensemble)
```



In [106]:

```
print_result(Deep_US30_pred)
```

You have long position [Timestamp('2021-11-01 00:00:00')] may be Price:35609.03125
sell position in [Timestamp('2021-11-25 00:00:00')] may be price:36972.88671875

In [107]:

```
US30_binary,US30_binary_pred = indices_binarizer(real_US30,Deep_US30_pred.drop(Deep_US30_pred.index[18]))  
print(f'Accuracy score:{accuracy_score(US30_binary,US30_binary_pred)}')
```

Accuracy score:0.5

Result

- 위의 딥러닝 모델을 사용하였을 경우 20일을 기준으로 지수(Indices)를 예측하여서 가장 높은가격의 날과 가장 낮은 가격의 날을 추출해서 Long(공매수), Short(공매도)을 이용하였을때 자동투자를 하면 좋은 결과를 낼 수 있을것 같다.
- 하지만 아직 모델이 정확하게 예측을 하지 못하는 것을 볼 수 있는데, 이 부분은 데이터를 더욱 증대를 해서 훈련을 시키거나, 모델의 레이어와 하이퍼파라미터 수정이 필요하것 같다.