

```

import pandas as pd

from sklearn.ensemble import RandomForestRegressor
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_absolute_error
from sklearn.preprocessing import StandardScaler

# K is used to define the number of folds that will be used for cross-validation
K = 10

# Split defines the % of data that will be used in the training sample
SPLIT = 0.75

# Load data
def load_data(path: str = "/path/to/csv/"):
    """
    This function takes a path string to a CSV file and loads it into
    a Pandas DataFrame.

    :param path (optional): str, relative path of the CSV file

    :return df: pd.DataFrame
    """

    df = pd.read_csv(f"{path}")
    df.drop(columns=["Unnamed: 0"], inplace=True, errors='ignore')
    return df

# Create target variable and predictor variables
def create_target_and_predictors(
    data: pd.DataFrame = None,
    target: str = "estimated_stock_pct"

```

):

"""

This function takes in a Pandas DataFrame and splits the columns into a target column and a set of predictor variables, i.e. X & y. These two splits of the data will be used to train a supervised machine learning model.

:param data: pd.DataFrame, dataframe containing data for the model

:param target: str (optional), target variable that you want to predict

:return X: pd.DataFrame

y: pd.Series

"""

# Check to see if the target variable is present in the data

if target not in data.columns:

raise Exception(f"Target: {target} is not present in the data")

X = data.drop(columns=[target])

y = data[target]

return X, y

# Train algorithm

def train\_algorithm\_with\_cross\_validation(

X: pd.DataFrame = None,

y: pd.Series = None

):

"""

This function takes the predictor and target variables and trains a Random Forest Regressor model across K folds. Using

cross-validation, performance metrics will be output for each fold during training.

```
:param    X: pd.DataFrame, predictor variables
```

```
:param    y: pd.Series, target variable
```

```
:return
```

```
"""
```

```
# Create a list that will store the accuracies of each fold
```

```
accuracy = []
```

```
# Enter a loop to run K folds of cross-validation
```

```
for fold in range(0, K):
```

```
    # Instantiate algorithm and scaler
```

```
    model = RandomForestRegressor()
```

```
    scaler = StandardScaler()
```

```
    # Create training and test samples
```

```
    X_train, X_test, y_train, y_test = train_test_split(X, y, train_size=SPLIT, random_state=42)
```

```
    # Scale X data, we scale the data because it helps the algorithm to converge
```

```
    # and helps the algorithm to not be greedy with large values
```

```
    scaler.fit(X_train)
```

```
    X_train = scaler.transform(X_train)
```

```
    X_test = scaler.transform(X_test)
```

```
    # Train model
```

```
    trained_model = model.fit(X_train, y_train)
```

```
# Generate predictions on test sample
y_pred = trained_model.predict(X_test)

# Compute accuracy, using mean absolute error
mae = mean_absolute_error(y_true=y_test, y_pred=y_pred)
accuracy.append(mae)
print(f"Fold {fold + 1}: MAE = {mae:.3f}")

# Finish by computing the average MAE across all folds
print(f"Average MAE: {(sum(accuracy) / len(accuracy)):.2f}")

# importing dataframe from the saved csv
df = load_data('C:/Users/manoj/Downloads/merged.csv')

X,y = create_target_and_predictors(df) # initializing target and predictor variables

train_algorithm_with_cross_validation(X,y) # training algorithm by target and predictor variables
```