

File to generate final models for each station

uses models generated in RandomForestWeather to generate future weather parameters Weather paraemeters joined with datetime parameters are used for prediction of

- available_bike_stands
- available_bikes

Data Preparation

```
In [1]: # Import pandas, numpy, matplotlib, seaborn libraries
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.patches as mpatches
from tabulate import tabulate
import datetime

# Using sklearn to split data into training and testing sets,train classifier
and regressor models
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn import metrics

#pickle package saves and loads sklearn models
import pickle

# hide ipykernel warnings
import warnings
warnings.filterwarnings('ignore')

%matplotlib inline
```

Import data

Import bike dynamic data from csv into dataframe

```
In [2]: # Read in data as pandas dataframe and display first 5 rows
bikeDynamic = pd.read_csv('dBikeD.csv')
bikeDynamic = bikeDynamic.drop(columns=['last_update', 'status'])
bikeDynamic.tail(5)
```

Out[2]:

	id_Entry	number	bike_stands	available_bike_stands	available_bikes	data_entry_timestamp
369165	370900	39	20	6	14	8/24/2020 11:00:00
369166	370901	83	40	27	13	9/24/2020 11:00:00
369167	370902	92	40	25	15	10/24/2020 11:00:00
369168	370903	21	30	22	8	11/24/2020 11:00:00
369169	370904	88	30	9	21	12/24/2020 11:00:00

check for shape

```
In [3]: print('The shape of our features is:', bikeDynamic.shape, '\n', bikeDynamic.dtypes)

The shape of our features is: (369170, 6)
  id_Entry      int64
  number        int64
  bike_stands   int64
  available_bike_stands  int64
  available_bikes    int64
  data_entry_timestamp  object
dtype: object
```

check for Null entries

```
In [4]: bikeDynamic.isnull().sum()

Out[4]: id_Entry      0
        number        0
        bike_stands   0
        available_bike_stands  0
        available_bikes    0
        data_entry_timestamp  0
dtype: int64
```

Import weather dynamic data from csv into dataframe

```
In [5]: # Read in data as pandas dataframe and display first 5 rows
weatherDynamic = pd.read_csv('dWeatherD.csv')
bikeDynamic.reset_index(drop=True)
weatherDynamic = weatherDynamic[['main_temp', 'main_feels_like', 'main_pressure', 'main_humidity', \
                                'main_temp_min', 'main_temp_max', 'wind_speed', 'wind_deg',
                                'data_entry_timestamp']]
weatherDynamic.tail(5)

Out[5]:
```

	main_temp	main_feels_like	main_pressure	main_humidity	main_temp_min	main_temp_max
3437	10	7	1018	66	8	
3438	11	9	1017	58	9	
3439	11	9	1017	58	9	
3440	11	9	1017	58	9	
3441	11	7	1017	62	10	

check for shape

```
In [6]: print('The shape of our features is:', weatherDynamic.shape, '\n', weatherDynamic.dtypes)

The shape of our features is: (3442, 9)
  main_temp      int64
  main_feels_like  int64
  main_pressure   int64
  main_humidity   int64
  main_temp_min   int64
  main_temp_max   int64
  wind_speed      float64
  wind_deg        float64
  data_entry_timestamp  object
dtype: object
```

check for Null entries

```
In [7]: weatherDynamic.isnull().sum()
```

```
Out[7]: main_temp          0
        main_feels_like    0
        main_pressure      0
        main_humidity      0
        main_temp_min      0
        main_temp_max      0
        wind_speed         0
        wind_deg          112
        data_entry_timestamp 0
        dtype: int64
```

check for Null entries

```
In [8]: weatherDynamic.loc[weatherDynamic['wind_deg'].isnull(),('wind_deg')] = weather
        Dynamic['wind_deg'].ffill()
```

```
In [9]: weatherDynamic.isnull().sum()
```

```
Out[9]: main_temp          0
        main_feels_like    0
        main_pressure      0
        main_humidity      0
        main_temp_min      0
        main_temp_max      0
        wind_speed         0
        wind_deg           0
        data_entry_timestamp 0
        dtype: int64
```

Process and normalise dates

Observation state that results for date 28 February and 24 March are patial. Hence, they can be dropped for data consistency. Its upto discracion of user whether to incorporate it for training or not.

dublin bikes

```
In [10]: #DATETIME DATA

# Select columns containing datetime data
continous_date_columns = bikeDynamic[['data_entry_timestamp']].columns

# Assign object type datetime to columns enlisted in continous_date_columns
for column in continous_date_columns:
    bikeDynamic[column] = pd.to_datetime(bikeDynamic[column])

# end_date = pd.to_datetime('2020-03-24')
# start_date = pd.to_datetime('2020-02-28')

# # Ommit partial data for dates 28-2-2020 and 24-3-2020
# mask = (bikeDynamic['data_entry_timestamp'].dt.date > start_date) & (bikeDynamic['data_entry_timestamp'].dt.date < end_date)
# bikeDynamic = bikeDynamic.loc[mask]

# # resolution to minutes
bikeDynamic['data_entry_timestamp'] = bikeDynamic['data_entry_timestamp'].dt.strftime("%Y-%m-%d %H:%M:00")

for column in continous_date_columns:
    bikeDynamic[column] = pd.to_datetime(bikeDynamic[column])

bikeDynamic.tail()
```

Out[10]:

	id_Entry	number	bike_stands	available_bike_stands	available_bikes	data_entry_timestamp
369165	370900	39	20	6	14	2020-08-24 10:41
369166	370901	83	40	27	13	2020-09-24 10:51
369167	370902	92	40	25	15	2020-10-24 00:01
369168	370903	21	30	22	8	2020-11-24 11:11
369169	370904	88	30	9	21	2020-12-24 11:21

```
In [11]: print('The shape of our features is:', bikeDynamic.shape, '\n', bikeDynamic.dtypes)
```

The shape of our features is: (369170, 6)

id_Entry	int64
number	int64
bike_stands	int64
available_bike_stands	int64
available_bikes	int64
data_entry_timestamp	datetime64[ns]
dtype:	object

dublin weather

```
In [12]: #DATETIME DATA

# Select columns containing datetime data
continous_date_columns = weatherDynamic[['data_entry_timestamp']].columns

# Assign object type datetime to columns enlisted in continous_date_columns
for column in continous_date_columns:
    weatherDynamic[column] = pd.to_datetime(weatherDynamic[column])

# end_date = pd.to_datetime('2020-03-24')
# start_date = pd.to_datetime('2020-02-28')

# # Ommit partial data for dates 28-2-2020 and 24-3-2020
# mask = (weatherDynamic['data_entry_timestamp'].dt.date > start_date) & (weatherDynamic['data_entry_timestamp'].dt.date < end_date)
# weatherDynamic = weatherDynamic.loc[mask]

# for column in continous_date_columns:
#     weatherDynamic[column] = pd.to_datetime(weatherDynamic[column])

weatherDynamic.tail()
```

Out[12]:

	main_temp	main_feels_like	main_pressure	main_humidity	main_temp_min	main_temp_max
3437	10	7	1018	66	8	12
3438	11	9	1017	58	9	13
3439	11	9	1017	58	9	13
3440	11	9	1017	58	9	13
3441	11	7	1017	62	10	14

```
In [13]: print('The shape of our features is:', weatherDynamic.shape, '\n', weatherDynamic.dtypes)

The shape of our features is: (3442, 9)
main_temp                int64
main_feels_like          int64
main_pressure            int64
main_humidity            int64
main_temp_min            int64
main_temp_max            int64
wind_speed               float64
wind_deg                 float64
data_entry_timestamp     datetime64[ns]
dtype: object
```

Merge bike and weather dataframes

```
In [14]: bikeDynamic.head()
```

Out[14]:

	id_Entry	number	bike_stands	available_bike_stands	available_bikes	data_entry_timestamp
0	1745	42	30	17	13	2020-02-28 15:00:00
1	1746	30	20	16	4	2020-02-28 15:00:00
2	1747	54	33	22	9	2020-02-28 15:00:00
3	1748	108	40	37	3	2020-02-28 15:00:00
4	1749	56	40	13	27	2020-02-28 15:00:00

```
In [15]: weatherDynamic.head()
```

Out[15]:

	main_temp	main_feels_like	main_pressure	main_humidity	main_temp_min	main_temp_max
0	12	7	987	87	11	14
1	12	7	987	87	11	14
2	11	6	987	87	11	12
3	12	5	987	71	11	12
4	12	5	987	71	11	12

```
In [16]: dfML = pd.merge(bikeDynamic, weatherDynamic, on='data_entry_timestamp')
print(dfML.shape)
dfML.head()

(369170, 14)
```

Out[16]:

	id_Entry	number	bike_stands	available_bike_stands	available_bikes	data_entry_timestamp
0	1745	42	30	17	13	2020-02-28 15:00:00
1	1746	30	20	16	4	2020-02-28 15:00:00
2	1747	54	33	22	9	2020-02-28 15:00:00
3	1748	108	40	37	3	2020-02-28 15:00:00
4	1749	56	40	13	27	2020-02-28 15:00:00

```
In [17]: print('The shape of our features is:', dfML.shape, '\n', dfML.dtypes)

The shape of our features is: (369170, 14)
id_Entry          int64
number            int64
bike_stands       int64
available_bike_stands int64
available_bikes    int64
data_entry_timestamp datetime64[ns]
main_temp         int64
main_feels_like   int64
main_pressure     int64
main_humidity     int64
main_temp_min     int64
main_temp_max     int64
wind_speed        float64
wind_deg          float64
dtype: object
```

Resolve date into time components

```
In [18]: #Drop 'last_update' feature
dfML['year'] = dfML.data_entry_timestamp.dt.year
dfML['Day'] = dfML.data_entry_timestamp.dt.day
dfML['month'] = dfML.data_entry_timestamp.dt.month
dfML['hour'] = dfML.data_entry_timestamp.dt.hour
dfML['minute'] = dfML.data_entry_timestamp.dt.minute
dfML['dayOfWeek'] = dfML.data_entry_timestamp.dt.weekday
```

Check logical integrity of data

Data integrity is checked for following cases:

- is "bike_stands" >= "available_bike_stands" + "available_bikes" [Any other sequence is incorrect]
- is "last_update" <= "data_entry_timestamp" [Any other sequence is incorrect]

```
In [19]: test_1 = dfML[["id_Entry","available_bike_stands","available_bikes","bike_stands"]][dfML["available_bike_stands"].add(dfML["available_bikes"], axis=0) >\
dfML["bike_stands"]]
print("Number of rows failing the test: ", test_1.shape[0])
test_1.head(5)
```

Number of rows failing the test: 18

Out[19]:

	id_Entry	available_bike_stands	available_bikes	bike_stands
	63885	65630	17	0
	248795	250540	16	1
	248905	250650	16	1
	249125	250870	16	1
	249235	250980	16	1

Remove errors by adding available_bikes and bike_stands

```
In [20]: dTest_1 = test_1["id_Entry"]

for data in dTest_1:
    dfML.loc[(dfML.id_Entry == data), 'bike_stands'] = dfML.loc[(dfML.id_Entry == data), 'available_bikes'] + dfML.loc[(dfML.id_Entry == data), 'available_bike_stands']
```

```
In [21]: test_1 = dfML[["id_Entry","available_bike_stands","available_bikes","bike_stands"]][dfML["available_bike_stands"].add(dfML["available_bikes"], axis=0) >\
dfML["bike_stands"]]
print("Number of rows failing the test: ", test_1.shape[0])
test_1.head(5)
```

Number of rows failing the test: 0

Out[21]:

	id_Entry	available_bike_stands	available_bikes	bike_stands
--	----------	-----------------------	-----------------	-------------

Set Data types prior to encoding

```
In [22]: dfML = dfML.drop(['bike_stands', 'id_Entry', 'data_entry_timestamp'], axis = 1)
dfML.reset_index(drop = True)
```

Out[22]:

	number	available_bike_stands	available_bikes	main_temp	main_feels_like	main_pressure
0	42	17	13	12	7	9
1	30	16	4	12	7	9
2	54	22	9	12	7	9
3	108	37	3	12	7	9
4	56	13	27	12	7	9
...
369165	39	6	14	10	7	10
369166	83	27	13	11	9	10
369167	92	25	15	11	9	10
369168	21	22	8	11	9	10
369169	88	9	21	11	7	10

369170 rows × 7 columns

```
In [23]: print('The shape of our features is:', dfML.shape, '\n', dfML.dtypes)

The shape of our features is: (369170, 17)
number                int64
available_bike_stands int64
available_bikes       int64
main_temp            int64
main_feels_like      int64
main_pressure        int64
main_humidity        int64
main_temp_min        int64
main_temp_max        int64
wind_speed           float64
wind_deg             float64
year                 int64
Day                  int64
month                int64
hour                 int64
minute               int64
dayOfWeek            int64
dtype: object
```

```
In [24]: # Assign data type category to columns listed in categorical_columns
categorical_columns = dfML[['year', 'month', 'dayOfWeek']].columns
for column in categorical_columns:
    dfML[column] = dfML[column].astype('category')
```



```
In [25]: print('The shape of our features is:', dfML.shape)
print(dfML.dtypes)
```

The shape of our features is: (369170, 17)

number	int64
available_bike_stands	int64
available_bikes	int64
main_temp	int64
main_feels_like	int64
main_pressure	int64
main_humidity	int64
main_temp_min	int64
main_temp_max	int64
wind_speed	float64
wind_deg	float64
year	category
Day	int64
month	category
hour	int64
minute	int64
dayOfWeek	category
dtype:	object

```
In [26]: dfML.head()
```

Out[26]:

	number	available_bike_stands	available_bikes	main_temp	main_feels_like	main_pressure	n
0	42	17	13	12	7	987	
1	30	16	4	12	7	987	
2	54	22	9	12	7	987	
3	108	37	3	12	7	987	
4	56	13	27	12	7	987	

Encoding

Dictionary vectorization

```
In [27]: dfML_enc = pd.get_dummies(dfML, prefix_sep='_')
# X head
dfML_enc.head()

dfML_enc.to_csv("FeaturesGetDummies.csv")
```

```
In [28]: print('Shape of features after one-hot encoding:', dfML_enc.shape)
```

Shape of features after one-hot encoding: (369170, 34)

Features and Labels

```
In [29]: # return dataframe without target variable for processing
def prepareDF(dfML, targetCol):
    target = np.array(dfML[targetCol])

    # Remove the target variable from dataframe
    dfML= dfML.drop(targetCol, axis = 1)

    # Saving feature names for later use
    feature_list = list(dfML.columns)

    # Convert to numpy array
    dfML_array = np.array(dfML)

    return dfML_array, target, feature_list
```

Training and Testing Sets

```
In [30]: def trainTestData(features, target):
    # Split the data into training and testing sets
    train_features, test_features, train_labels, test_labels = train_test_split(features, target, test_size = 0.25,
    random_state = 42)
    return train_features, test_features, train_labels, test_labels
```

Training the Forest

```
In [31]: def trainRandomForest(train_features, train_labels):
    # Instantiate model
    rf = RandomForestRegressor(n_estimators= 100, random_state=42)

    # Train the random forest model
    rf.fit(train_features, train_labels)

    return rf
```

Make Predictions on Test Data

```
In [32]: def predictRandomForest(rf, test_features):
    # Use the forest's predict method on the test data
    predictions = rf.predict(test_features)

    return predictions
```

View Results

```
In [33]: def result(predictions, test_labels, targetCol, station):

    # Save results to CSV

    with open('result_'+targetCol+'.csv', 'a') as resultCSV:
        resultCSV.write(str(station)+",")
        resultCSV.write(str(metrics.mean_absolute_error(test_labels, predictions))+",")
        resultCSV.write(str(metrics.mean_squared_error(test_labels, predictions))+",")
        resultCSV.write(str(metrics.mean_squared_error(test_labels, predictions, squared=False))+",")
        resultCSV.write(str(metrics.r2_score(test_labels, predictions))+"\n")
        resultCSV.close()

    print('\n=====')
    print("Station", station, "\t", targetCol)
    print("MAE: ", metrics.mean_absolute_error(test_labels, predictions))
    print("MSE: ", metrics.mean_squared_error(test_labels, predictions))
    print("RMSE: ", metrics.mean_squared_error(test_labels, predictions, squared=False))
    print("R2: ", metrics.r2_score(test_labels, predictions), "\n")
    resultCSV.close()

    plt.plot(test_labels[:10])
    # plt.xticks(range(len(dates)), dates)
    plt.plot(predictions[:10])

    plt.xlabel('Time')
    plt.ylabel(targetCol)

    plt.show()
```

Variable Importances

```
In [34]: def show_Importance(rf, features):
    # Get numerical feature importances
    importances = list(rf.feature_importances_)

    # List of tuples with variable and importance
    feature_importances = [(features, round(importance, 2)) for features, importance in zip(feature_list, importances)]

    # Sort the feature importances by most important first
    feature_importances = sorted(feature_importances, key = lambda x: x[1], reverse = True)

    # Print out the feature and importances
    [print('Variable: {:20} Importance: {}'.format(*pair)) for pair in feature_importances]
```

Pipeline

```

In [35]: # Data processing pipeline
targetCols = ['available_bikes', 'available_bike_stands']
# *****
*****

stations = dfML_enc['number'].unique()

with open('result_available_bikes.csv', 'a') as resultCSV:
    resultCSV.write("Station,MAE, MSE, RMSE, R2\n")
with open('result_available_bike_stands.csv', 'a') as resultCSV:
    resultCSV.write("Station,MAE, MSE, RMSE, R2\n")

for station in stations:
    dfML_station = dfML_enc.loc[dfML_enc['number'] == station]
    dfML_enc_DA = dfML_station

    for targetCol in targetCols:

        # Array of target variables
        target = np.array(dfML_enc_DA[targetCol])

        dfML_pipeline = dfML_enc_DA.drop(['available_bikes', 'available_bike_stands', 'number'], axis = 1)

        # Saving input feature names for later use
        feature_list = list(dfML_pipeline.columns)
        # Convert to numpy array
        features = np.array(dfML_pipeline)

        train_features, test_features, train_labels, test_labels = trainTestDa
ta(features, target)
        rfBikeModel = trainRandomForest(train_features, train_labels)

        # save the model
        filename = 'stn'+str(station)+"_"+targetCol+'.pkl'
        pickle.dump(rfBikeModel, open(filename, 'wb'))

        # Load the model
        rfBikeModel_loaded = pickle.load(open(filename, 'rb'))
        predictions = predictRandomForest(rfBikeModel_loaded, test_features)
        result(predictions, test_labels, targetCol, station)
        # show_Importance(rfBikeModel_Loaded, features)

```

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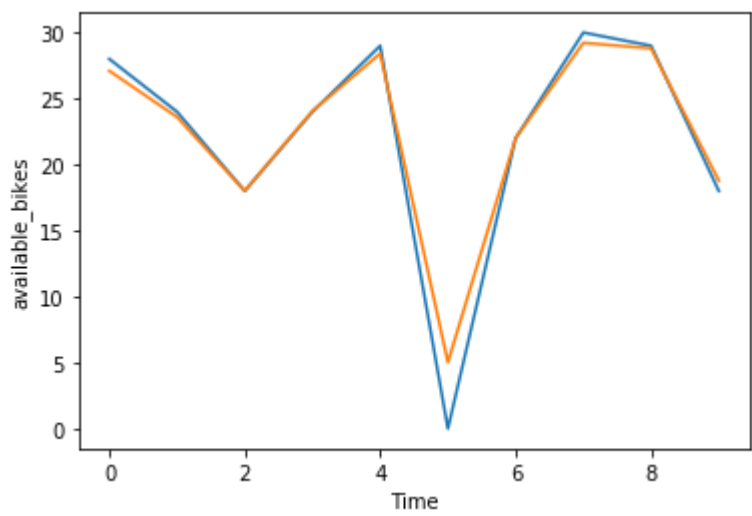
Station 42 available_bikes

MAE: 0.8727175208581646

MSE: 1.831301907032181

RMSE: 1.3532560389786483

R2: 0.9770625634635772



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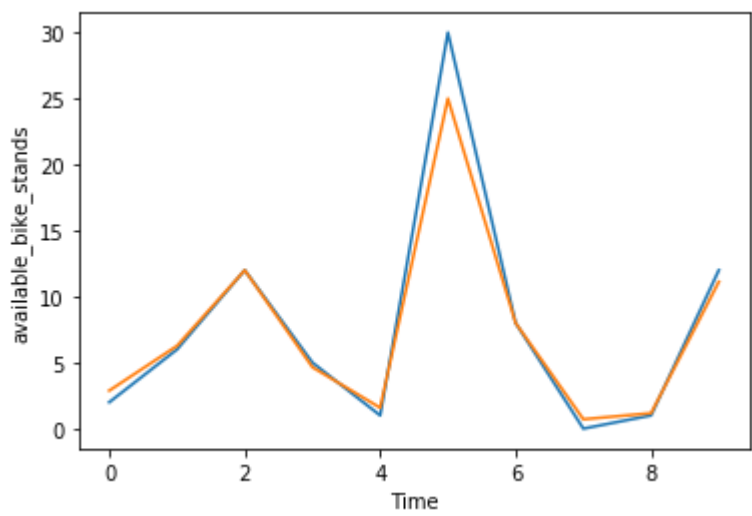
Station 42 available_bike_stands

MAE: 0.8705244338498213

MSE: 1.808843504171633

RMSE: 1.3449325277394524

R2: 0.9773926276872914



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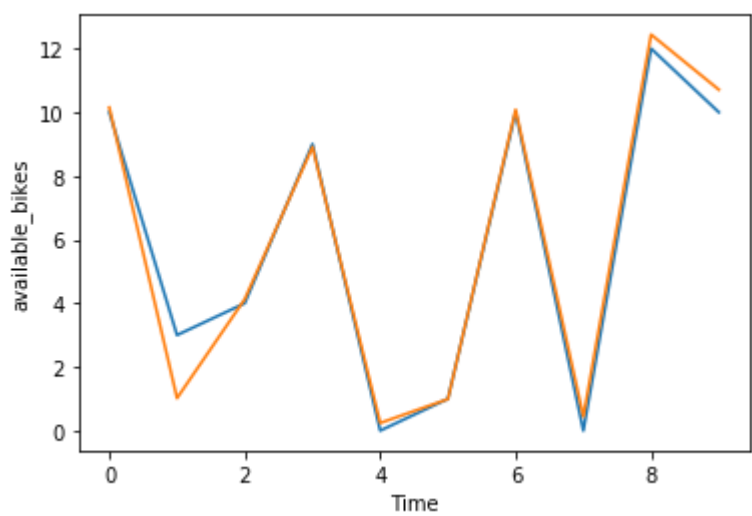
Station 30 available_bikes

MAE: 0.46027413587604293

MSE: 0.68737747318236

RMSE: 0.8290823078454636

R2: 0.9623874784267615



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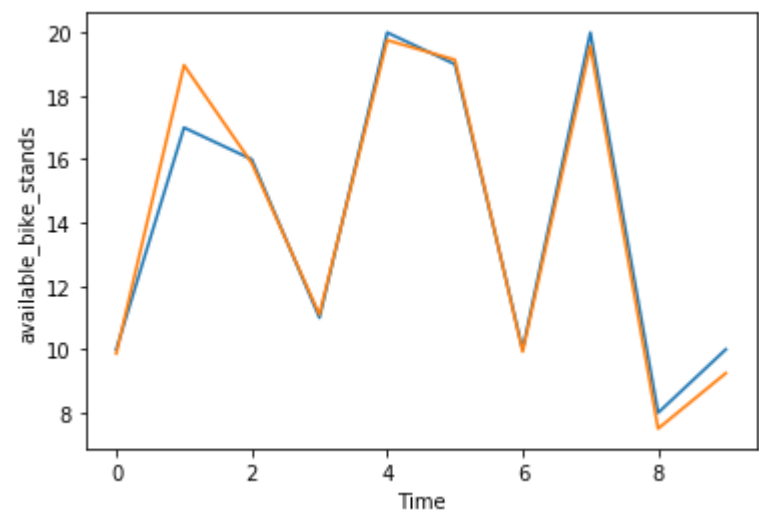
Station 30 available_bike_stands

MAE: 0.4651251489868892

MSE: 0.7033902264600715

RMSE: 0.8386836271563143

R2: 0.9614390445335048



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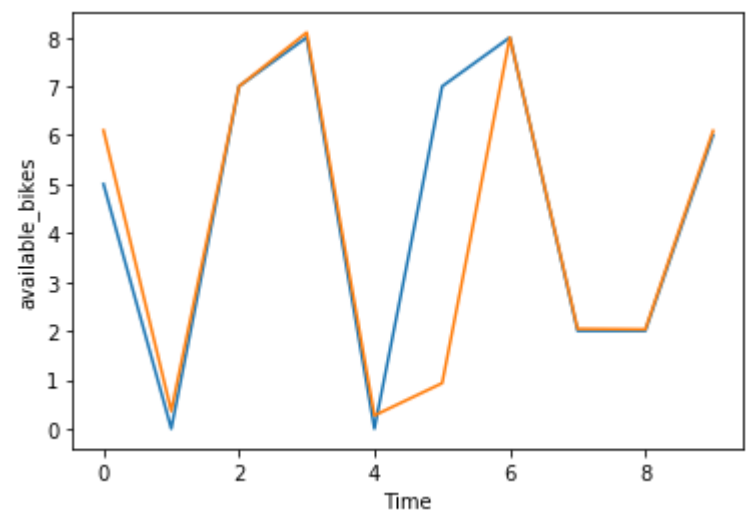
Station 54 available_bikes

MAE: 0.5204052443384982

MSE: 1.2381456495828367

RMSE: 1.1127199331291036

R2: 0.9738538604280008



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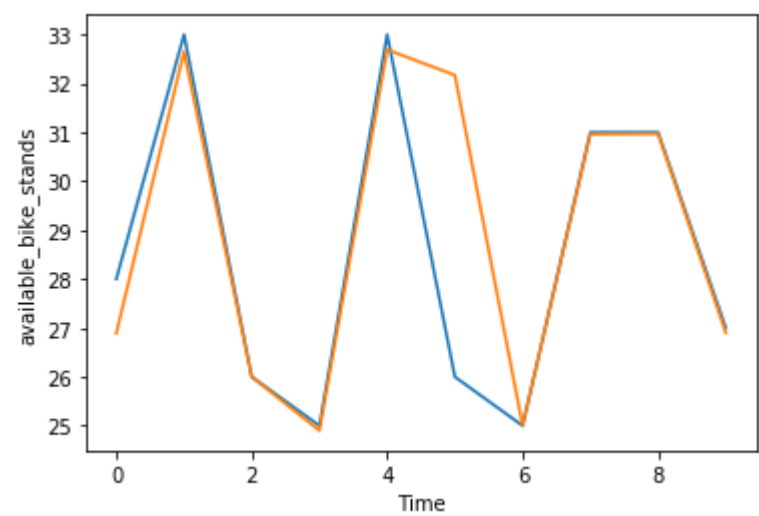
Station 54 available_bike_stands

MAE: 0.5224910607866509

MSE: 1.2542790226460072

RMSE: 1.1199459909504597

R2: 0.9735208680567407



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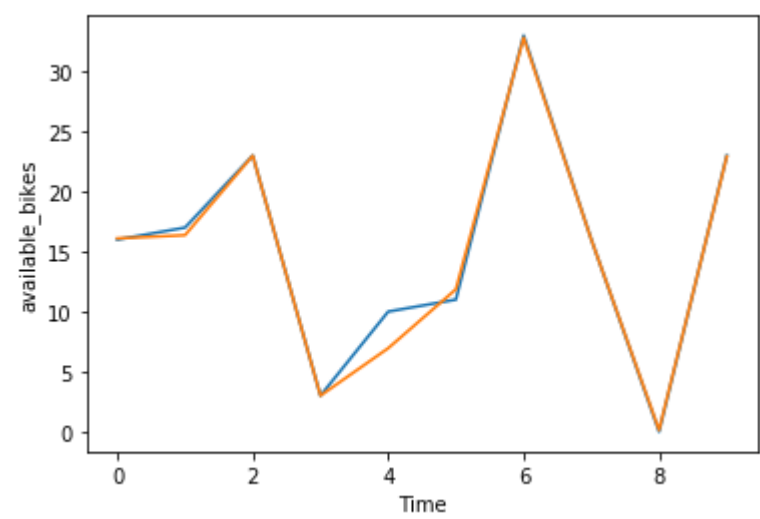
Station 108 available_bikes

MAE: 0.5127890345649584

MSE: 1.1197860548271754

RMSE: 1.0581994400051322

R2: 0.9891088654359227



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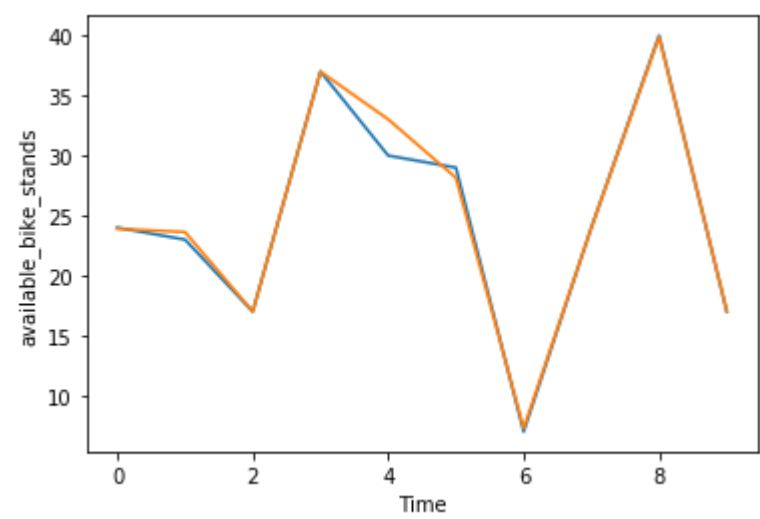
Station 108 available_bike_stands

MAE: 0.5140405244338498

MSE: 1.120074135876043

RMSE: 1.0583355497553897

R2: 0.9891095349631402



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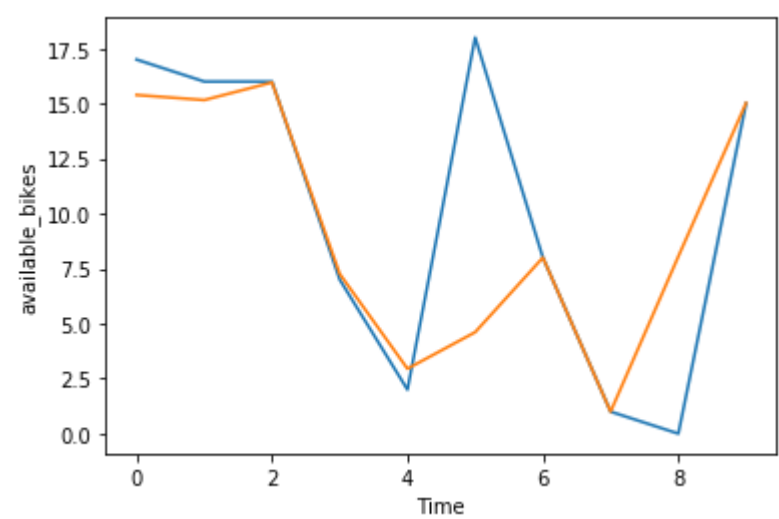
Station 56 available_bikes

MAE: 1.2205363528009534

MSE: 5.478939094159715

RMSE: 2.340713372918546

R2: 0.9455337862524459



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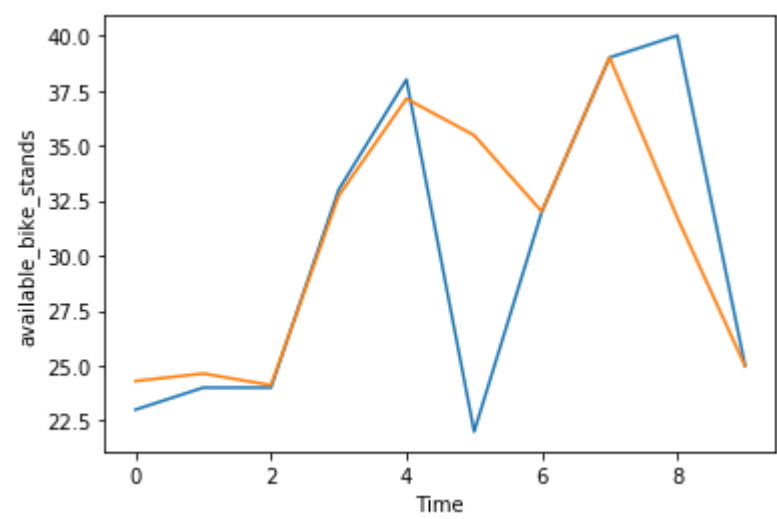
Station 56 available_bike_stands

MAE: 1.212777115613826

MSE: 5.411273420738975

RMSE: 2.3262143969847178

R2: 0.9470561887528935



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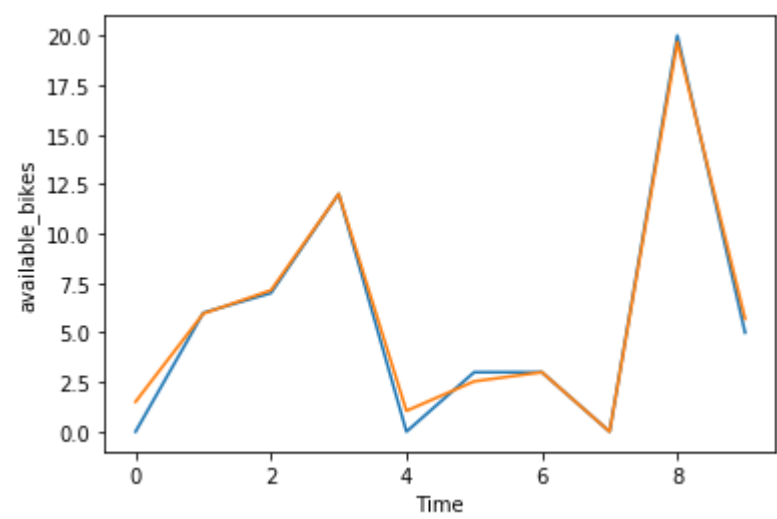
Station 6 available_bikes

MAE: 0.577938021454112

MSE: 0.9233243146603098

RMSE: 0.9608976608673319

R2: 0.9753788731164544



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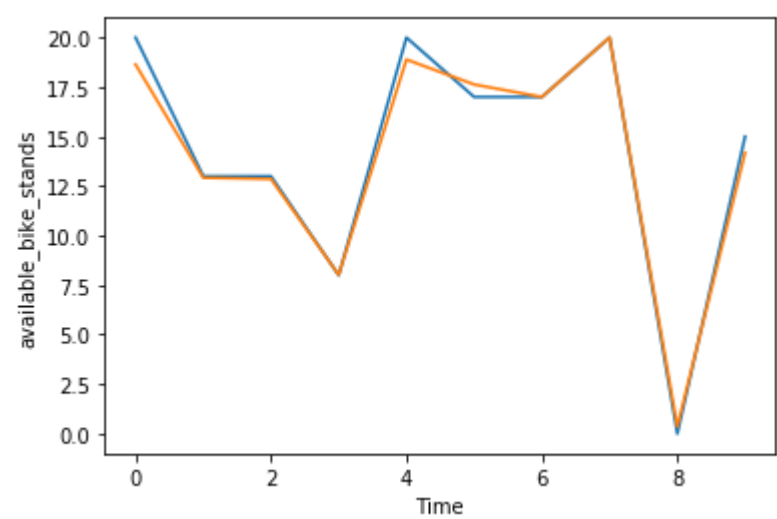
Station 6 available_bike_stands

MAE: 0.5836829558998808

MSE: 0.9483059594755662

RMSE: 0.973810022271062

R2: 0.9745994198333149



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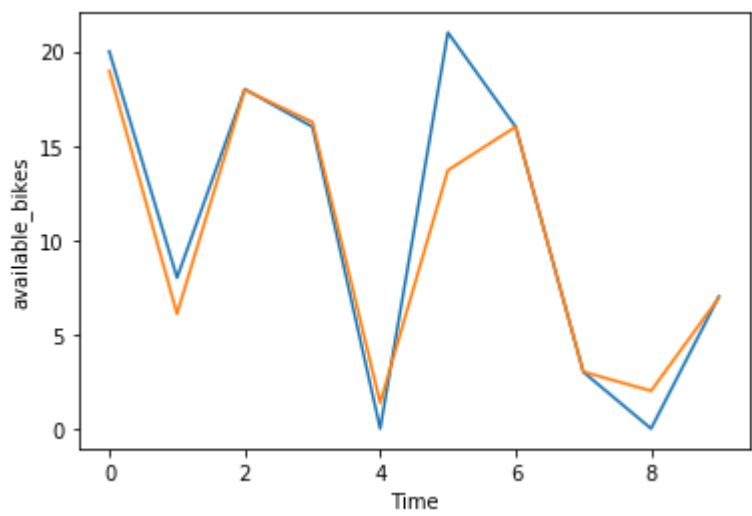
Station 18 available_bikes

MAE: 0.9376281287246723

MSE: 3.04596126340882

RMSE: 1.7452682496994036

R2: 0.9516213157193013



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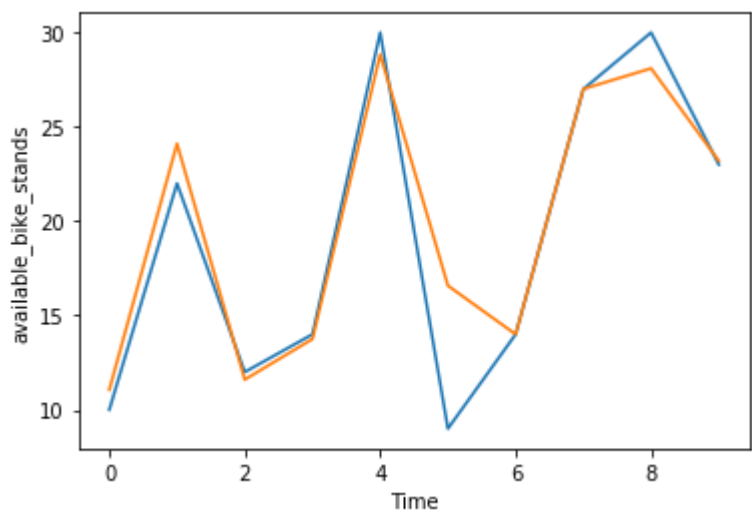
Station 18 available_bike_stands

MAE: 0.9393087008343267

MSE: 3.0216667461263405

RMSE: 1.738294205859969

R2: 0.9521685858482507



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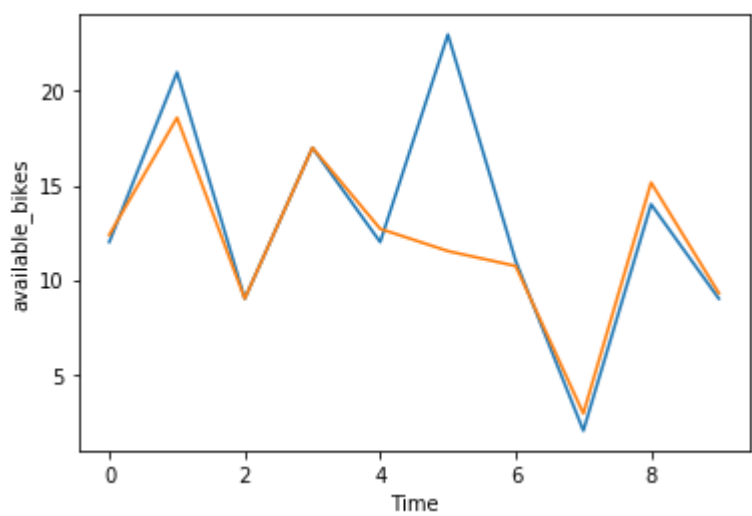
Station 32 available_bikes

MAE: 1.0832419547079857

MSE: 3.9734986889153756

RMSE: 1.9933636619832757

R2: 0.8962750265651089



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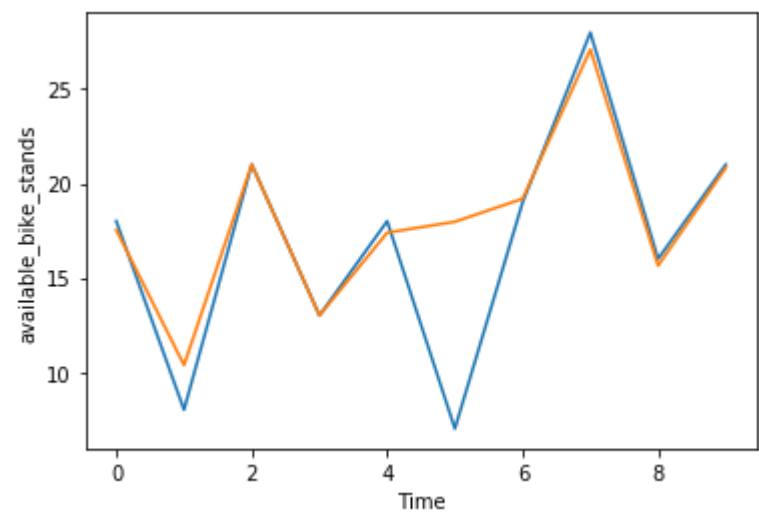
Station 32 available_bike_stands

MAE: 1.0988796185935639

MSE: 3.99318379022646

RMSE: 1.9982952209887457

R2: 0.8966054106366341



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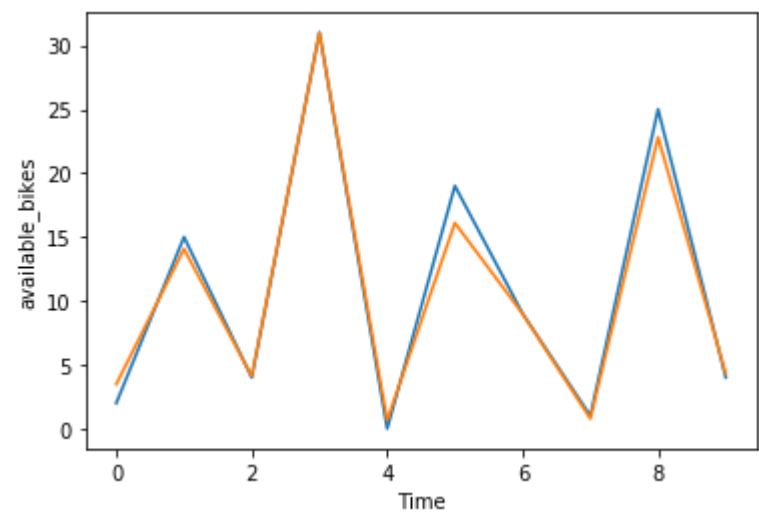
Station 52 available_bikes

MAE: 0.7533373063170441

MSE: 2.5478909415971396

RMSE: 1.5962114338636781

R2: 0.9609405227003817



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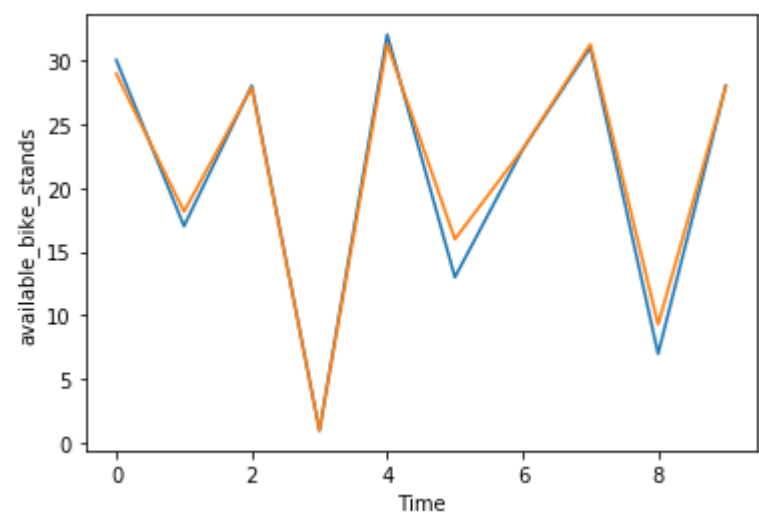
Station 52 available_bike_stands

MAE: 0.7554588796185935

MSE: 2.4564616209773535

RMSE: 1.5673103141935083

R2: 0.9625942858469848



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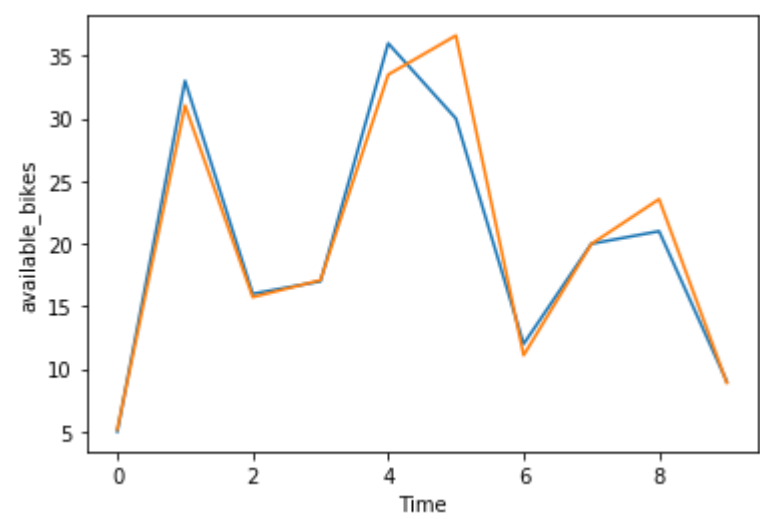
Station 48 available_bikes

MAE: 1.0049463647199046

MSE: 3.6203486293206195

RMSE: 1.902721374589727

R2: 0.9655794229358785



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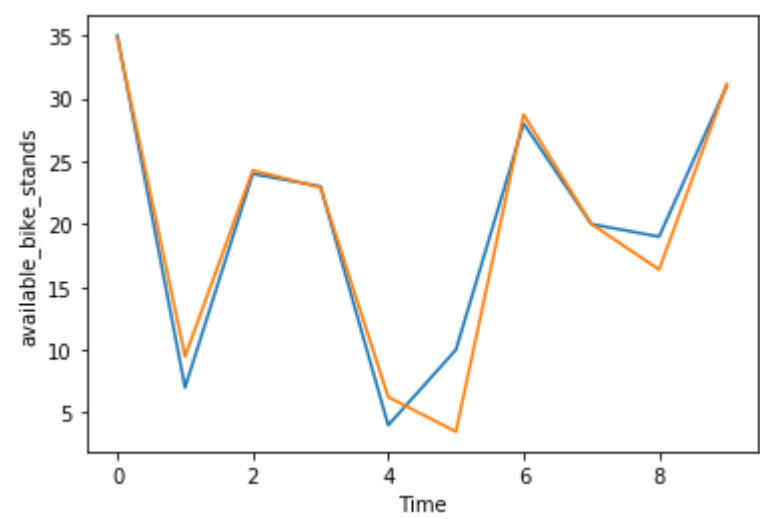
Station 48 available_bike_stands

MAE: 0.9983551847437427

MSE: 3.5751620977354

RMSE: 1.8908099052351615

R2: 0.9660010322095027



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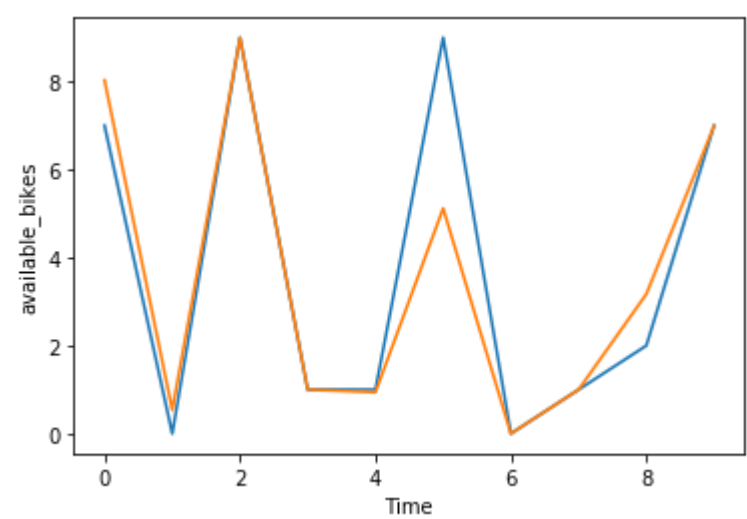
Station 13 available_bikes

MAE: 0.5024672228843862

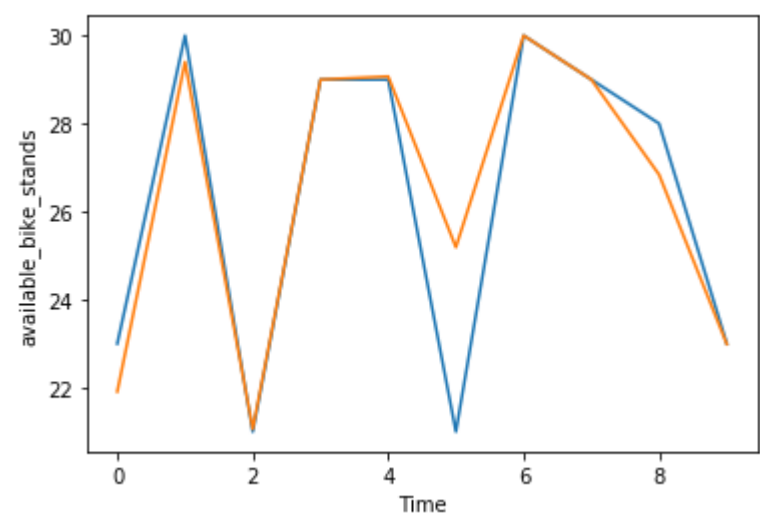
MSE: 1.3055023837902264

RMSE: 1.1425858321326352

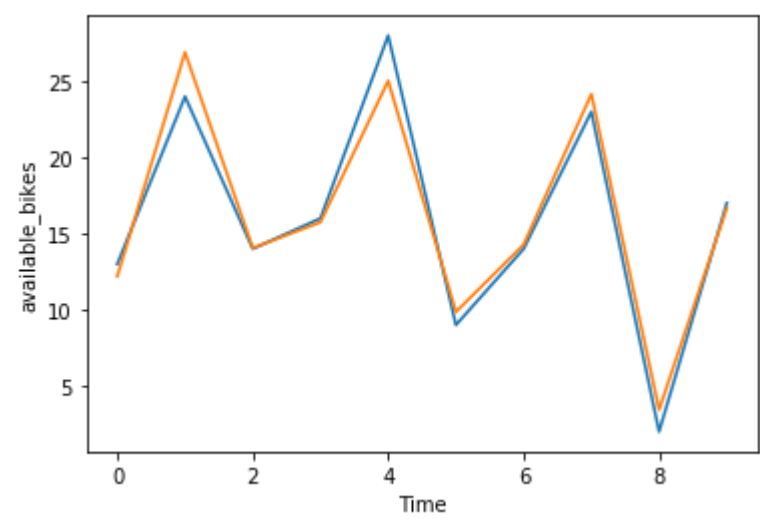
R2: 0.9774732903223624



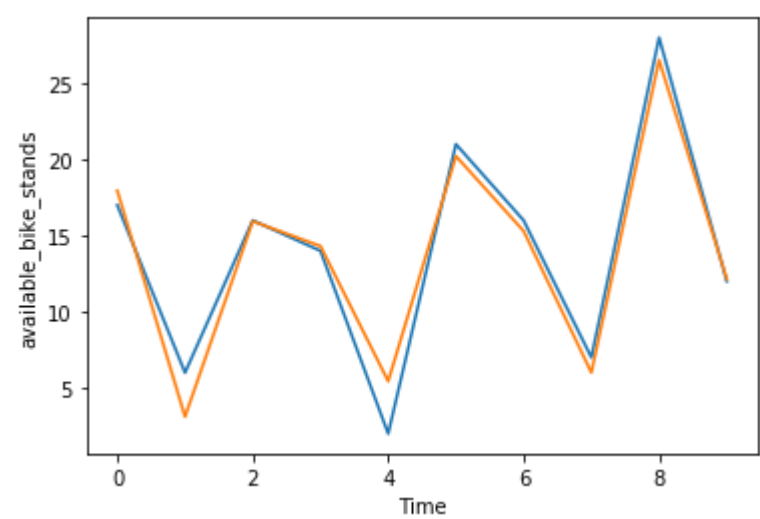
```
=====
=
Station 13      available_bike_stands
MAE:  0.518772348033373
MSE:  1.3670172824791418
RMSE:  1.1691951430275196
R2:   0.9767662243107604
```



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=====
=
Station 43      available_bikes
MAE:  1.062550655542312
MSE:  3.697713230035757
RMSE:  1.922943896746797
R2:   0.9472730276280716
```



```
=====
=
Station 43      available_bike_stands
MAE:  1.0660190703218118
MSE:  3.727307866507748
RMSE:  1.9306236988361425
R2:   0.9470501888932489
```



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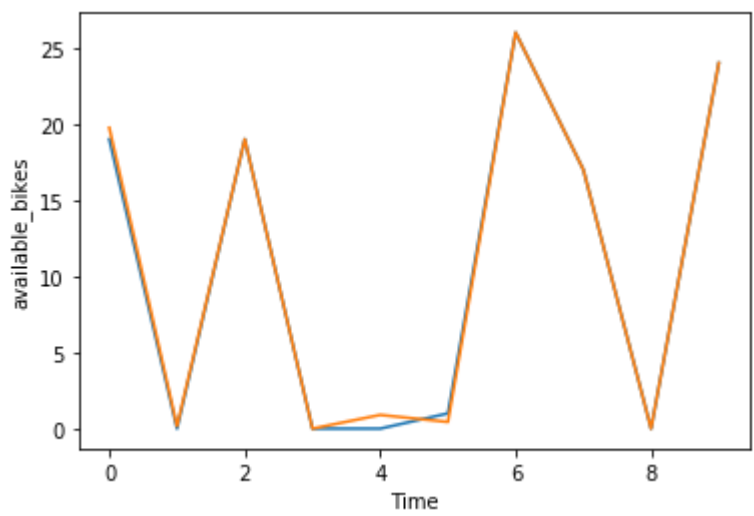
Station 81 available_bikes

MAE: 0.40685339690107275

MSE: 0.7513066746126341

RMSE: 0.8667794844207113

R2: 0.9912073896804195



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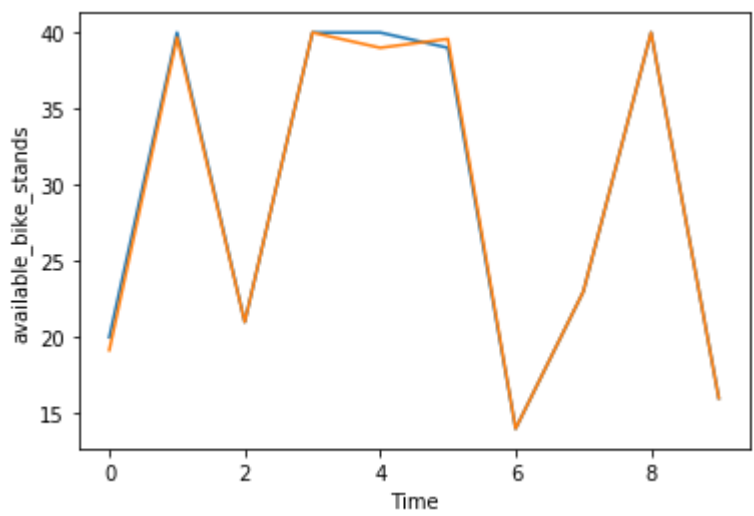
Station 81 available_bike_stands

MAE: 0.4008939213349226

MSE: 0.7214825983313469

RMSE: 0.8494013175945437

R2: 0.9916573860506502



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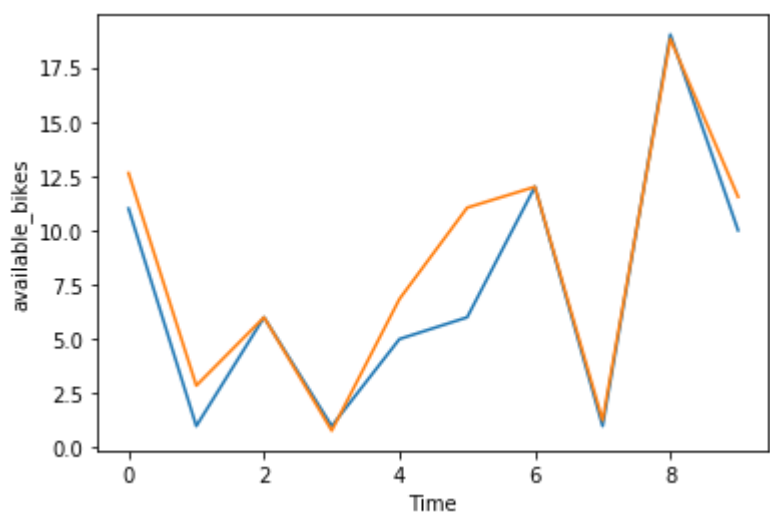
Station 31 available_bikes

MAE: 1.0296901072705602

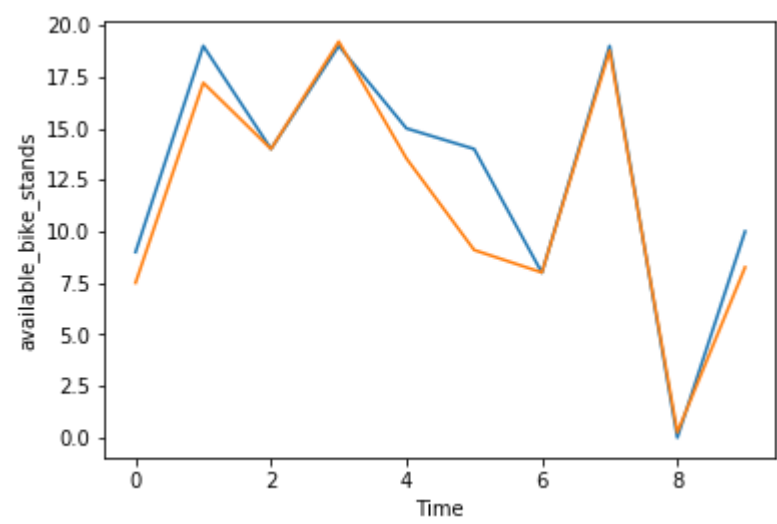
MSE: 2.7089405244338494

RMSE: 1.645885939071675

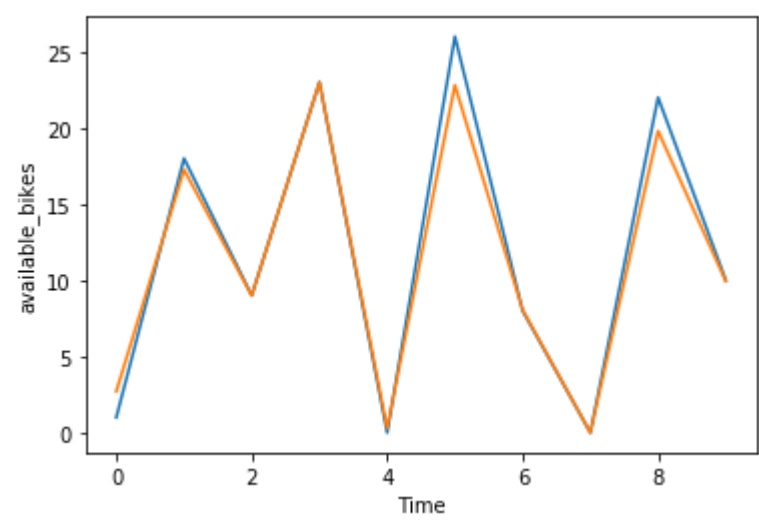
R2: 0.9247746342700973



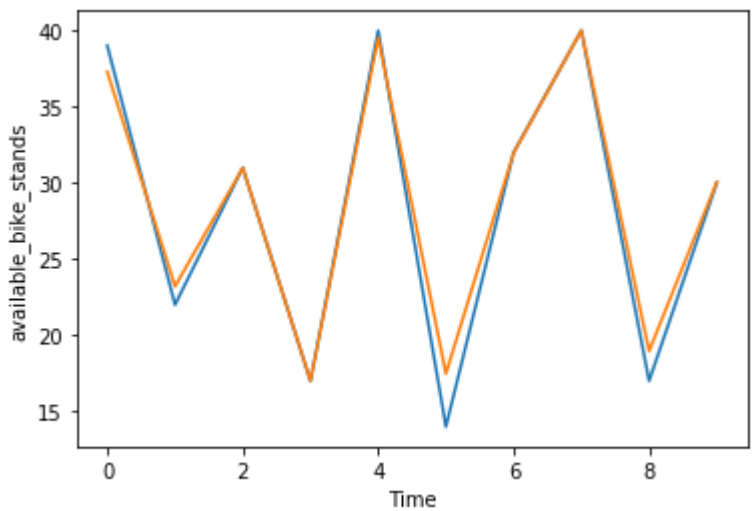
```
=====
=
Station 31      available_bike_stands
MAE:  1.0396185935637663
MSE:  2.7682102502979737
RMSE:  1.6637939326424933
R2:   0.9232920676115837
```



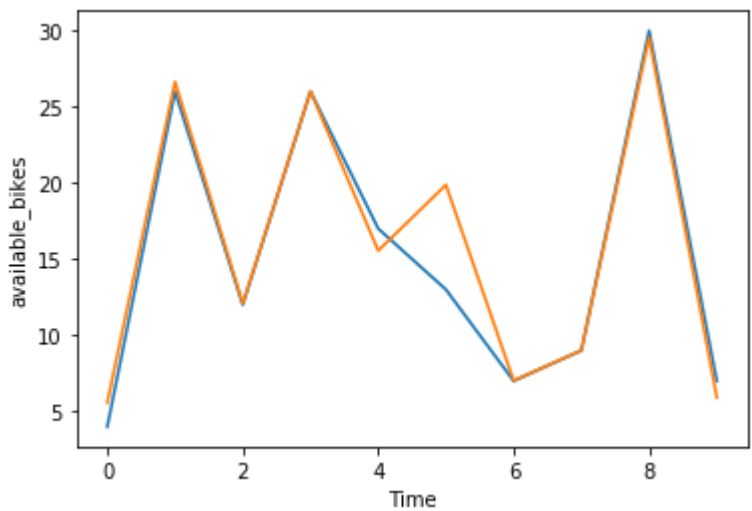
```
=====
=
Station 98      available_bikes
MAE:  0.5243027413587603
MSE:  1.2099872467222885
RMSE:  1.0999942030403107
R2:   0.9883241388982273
```



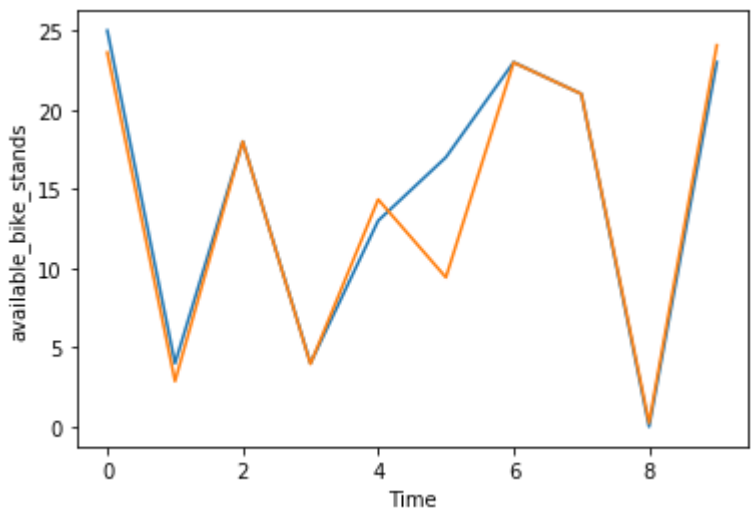
```
=====
=
Station 98      available_bike_stands
MAE:  0.5313706793802146
MSE:  1.2523609058402858
RMSE:  1.1190893198669558
R2:   0.987938636984914
```



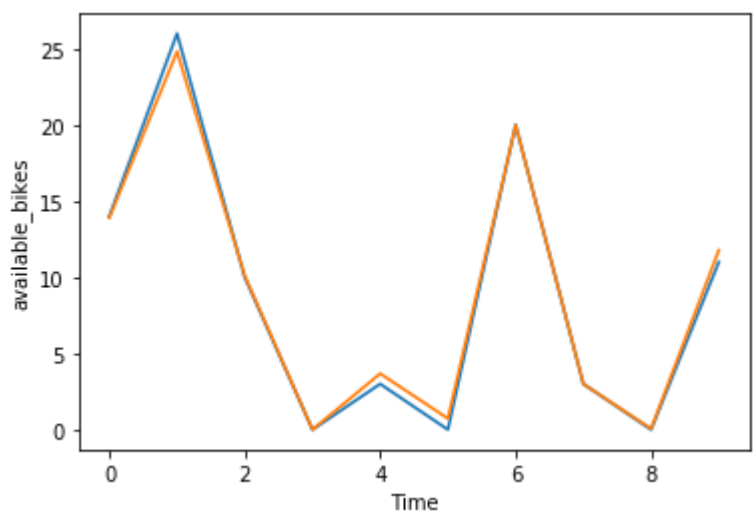
```
=====
=
Station 23      available_bikes
MAE:  1.0967699642431468
MSE:  3.7922935637663886
RMSE:  1.9473812065865246
R2:   0.9382333952671091
```



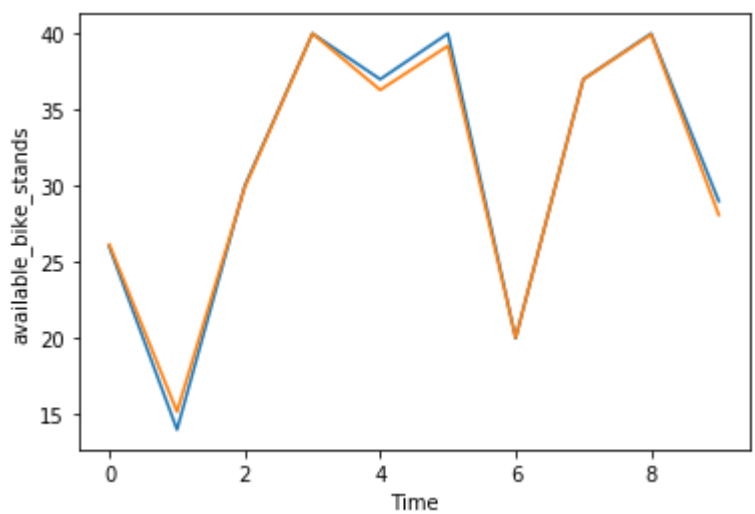
```
=====
=
Station 23      available_bike_stands
MAE:  1.1065554231227652
MSE:  3.9776991656734215
RMSE:  1.9944169989431553
R2:   0.9360854474645997
```



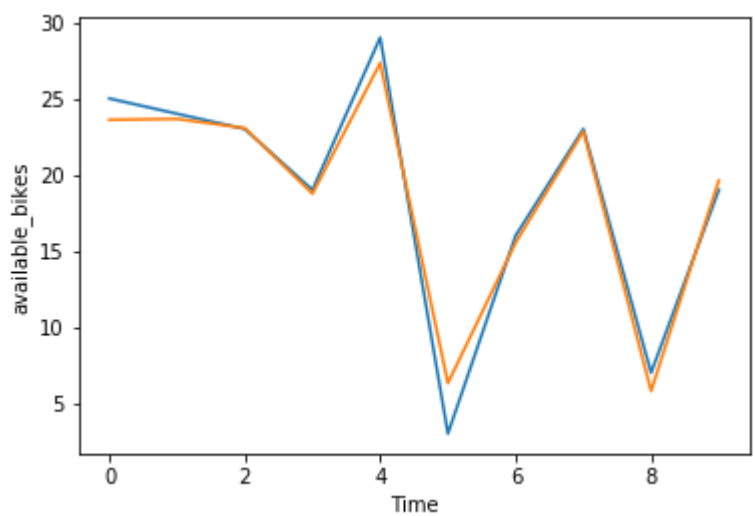
```
=====
=
Station 106     available_bikes
MAE:  0.5793563766388559
MSE:  1.9553885578069132
RMSE:  1.3983520864957126
R2:   0.9756610553883062
```



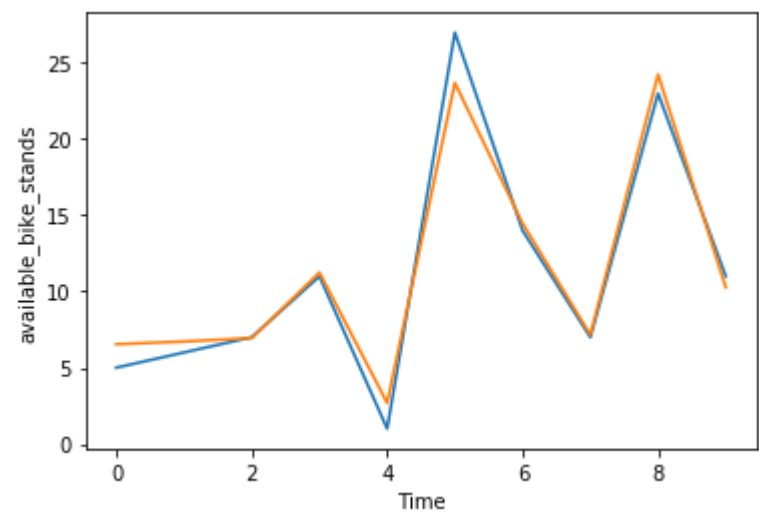
```
=====
=
Station 106      available_bike_stands
MAE:  0.5797020262216925
MSE:  1.9660487485101308
RMSE:  1.402158603193708
R2:   0.9755264730451549
```



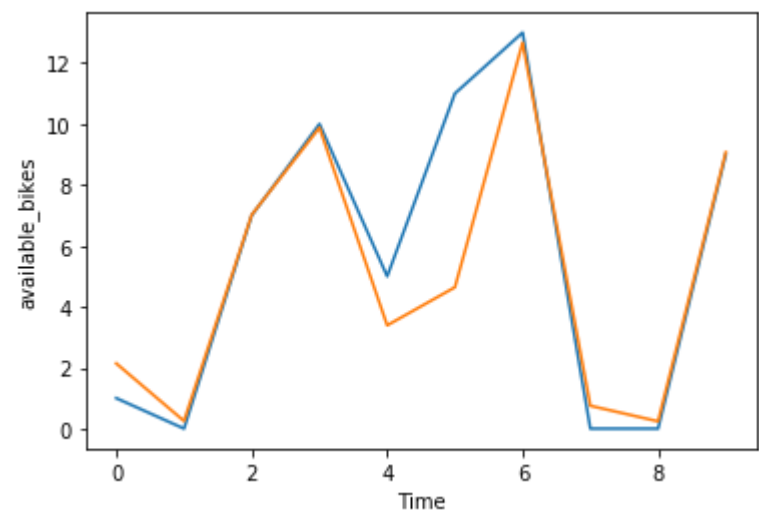
```
=====
=
Station 112      available_bikes
MAE:  0.9467699642431466
MSE:  2.379770679380215
RMSE:  1.5426505370239285
R2:   0.9748885102451792
```



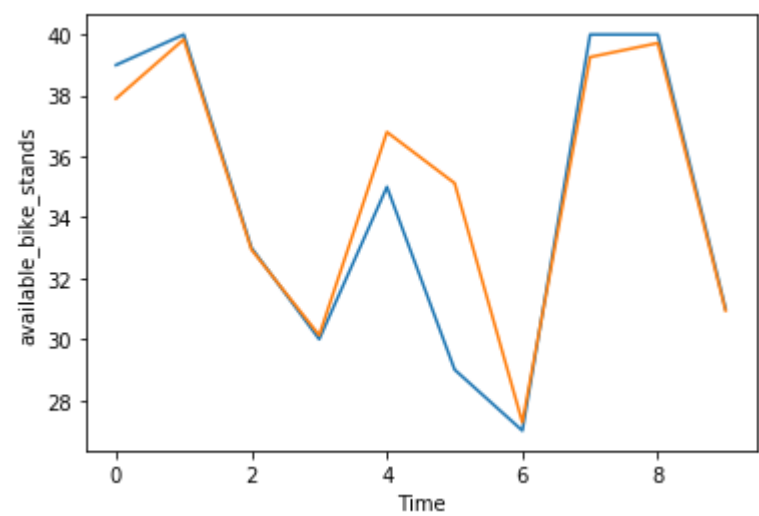

```
=====
=
Station 112      available_bike_stands
MAE:  0.9517163289630513
MSE:  2.386104767580453
RMSE:  1.5447021614474594
R2:   0.9748201295061716
```



```
=====
=
Station 68      available_bikes
MAE:  1.0685458879618595
MSE:  3.8246575685339685
RMSE:  1.95567317528619
R2:   0.9660272656384409
```



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=====
=
Station 68      available_bike_stands
MAE:  1.0566030989272943
MSE:  3.6846859356376642
RMSE:  1.919553577173001
R2:   0.9679694956525944
```



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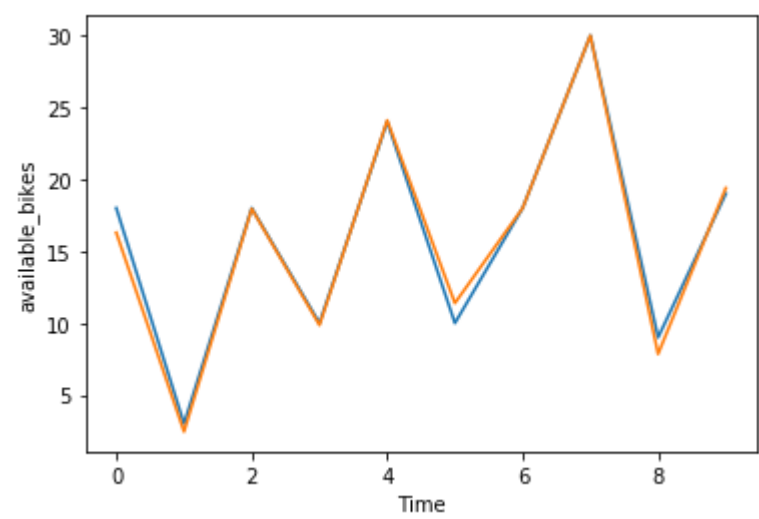
Station 74 available_bikes

MAE: 0.6258641239570919

MSE: 1.1398967818831942

RMSE: 1.0676594877971133

R2: 0.9794767095007401



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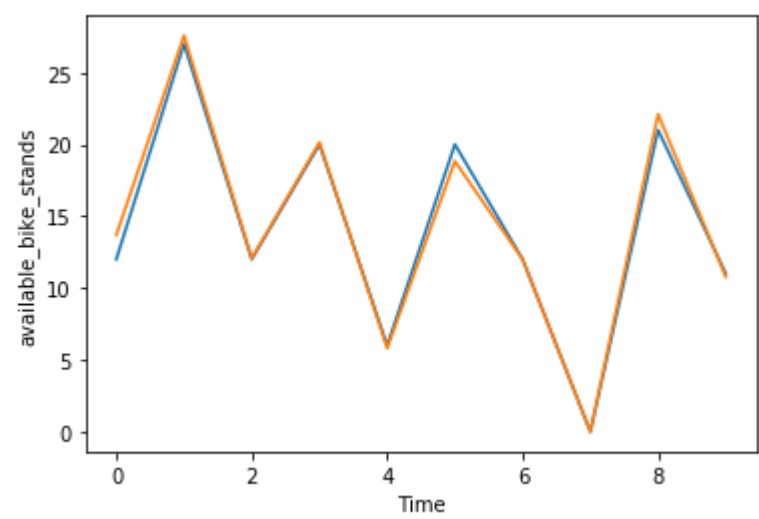
Station 74 available_bike_stands

MAE: 0.6252800953516091

MSE: 1.1503357568533972

RMSE: 1.07253706549163

R2: 0.979286468889523



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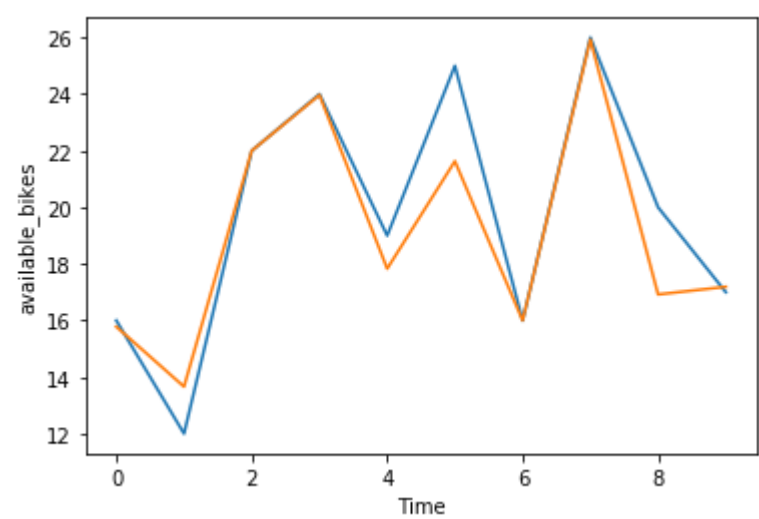
Station 87 available_bikes

MAE: 0.6010369487485101

MSE: 1.2309908224076282

RMSE: 1.1095002579574411

R2: 0.9847178168957623



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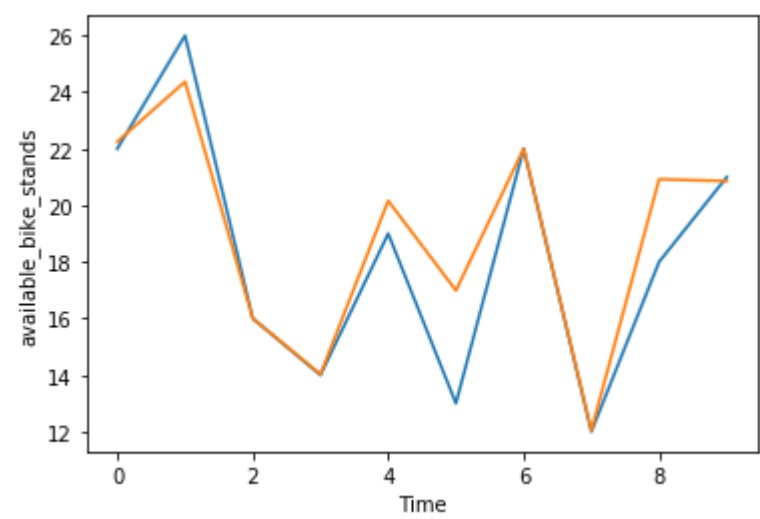
Station 87 available_bike_stands

MAE: 0.5987485101311085

MSE: 1.2191572109654352

RMSE: 1.104154523137697

R2: 0.9848448491563455



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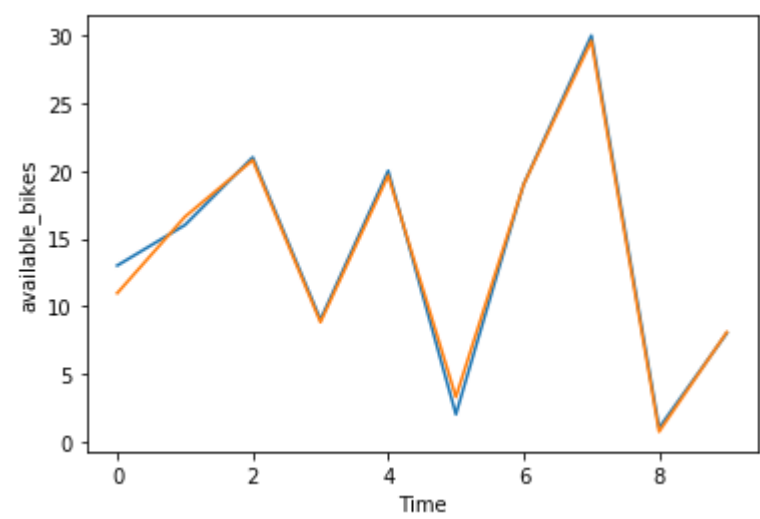
Station 84 available_bikes

MAE: 0.7318116805721097

MSE: 1.8646528009535162

RMSE: 1.3655229038553385

R2: 0.976906105013291



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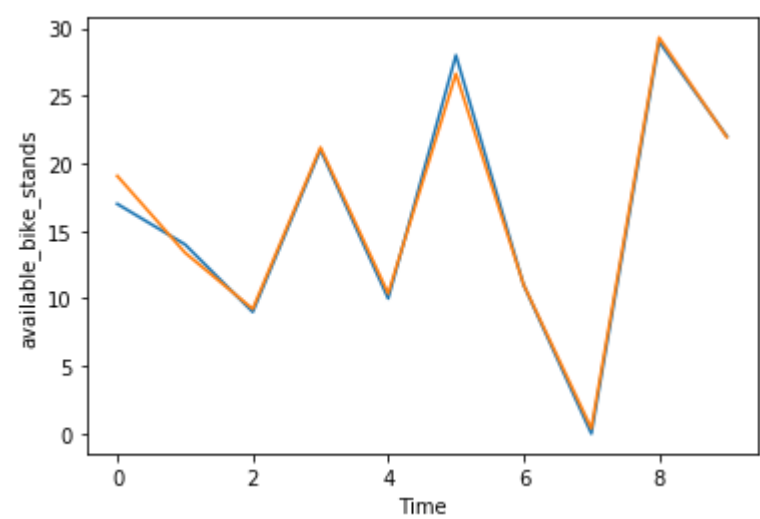
Station 84 available_bike_stands

MAE: 0.733933253873659

MSE: 1.8988902264600716

RMSE: 1.3780022592362

R2: 0.976516362944058



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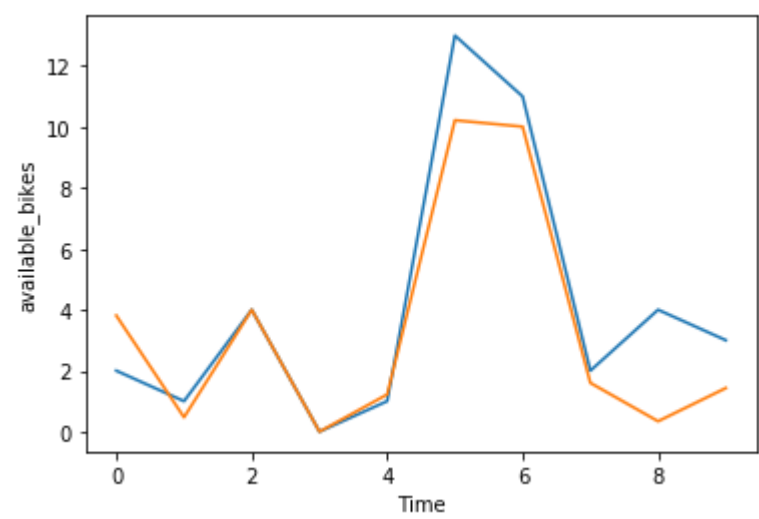
Station 90 available_bikes

MAE: 0.7293444576877236

MSE: 2.2879823599523244

RMSE: 1.5126078011012387

R2: 0.9801041967011702



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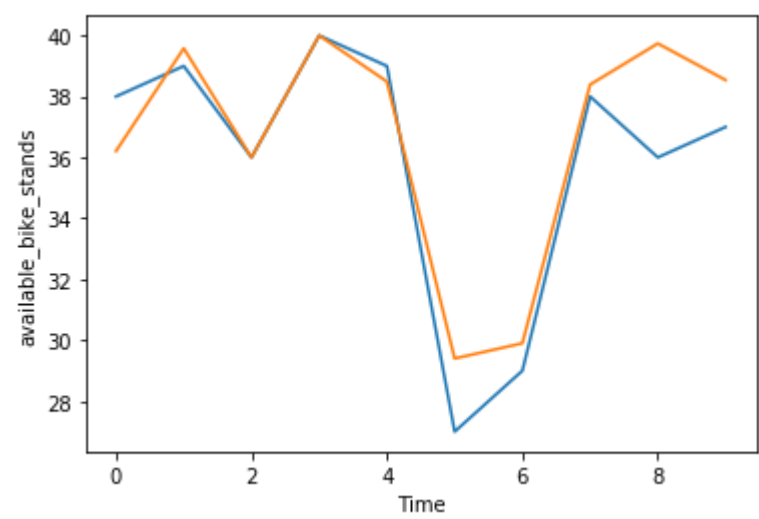
Station 90 available_bike_stands

MAE: 0.7278069129916569

MSE: 2.285152920143027

RMSE: 1.5116722264244413

R2: 0.9801784077267787



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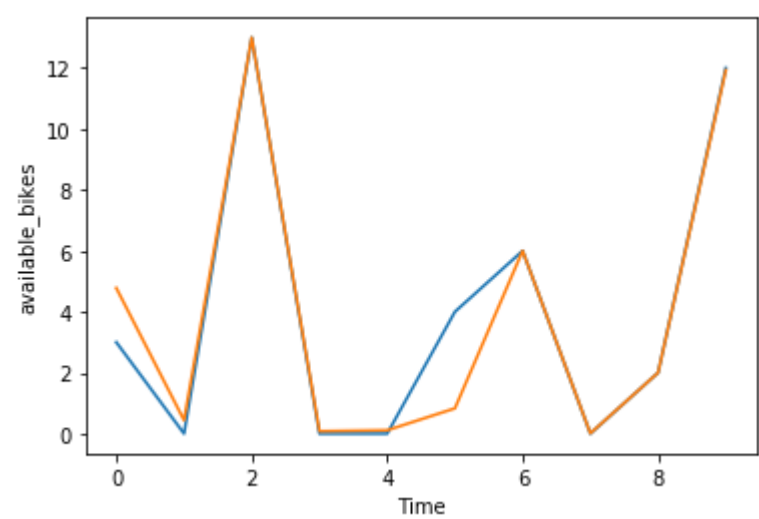
Station 11 available_bikes

MAE: 0.5466626936829558

MSE: 1.8253245530393325

RMSE: 1.3510457257396333

R2: 0.966204619376613



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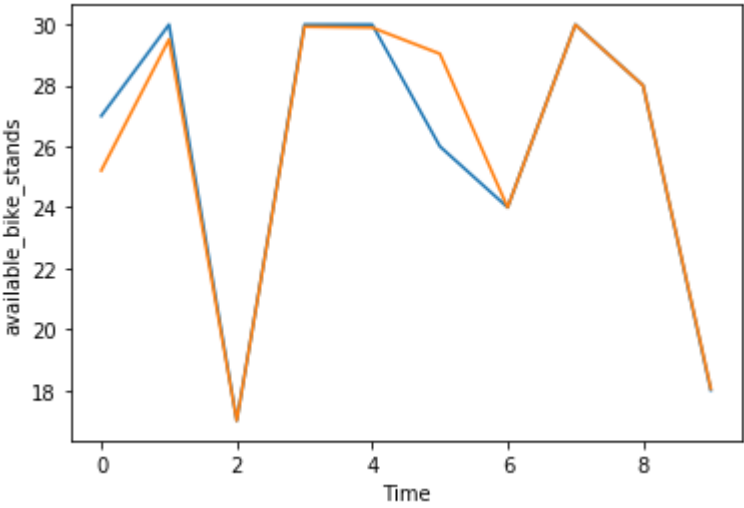
Station 11 available_bike_stands

MAE: 0.5396305125148987

MSE: 1.8542139451728248

RMSE: 1.361695246805549

R2: 0.9663733144858137



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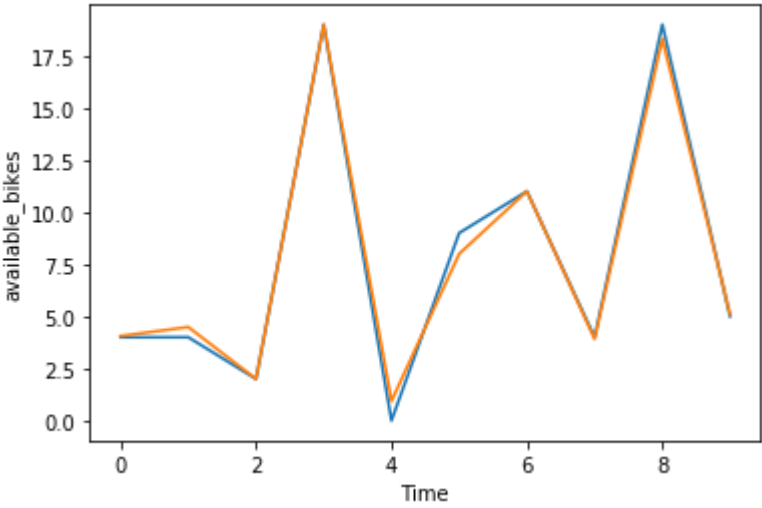
Station 17 available_bikes

MAE: 0.5303098927294397

MSE: 0.7906766388557807

RMSE: 0.8891999993566018

R2: 0.9683418646151354



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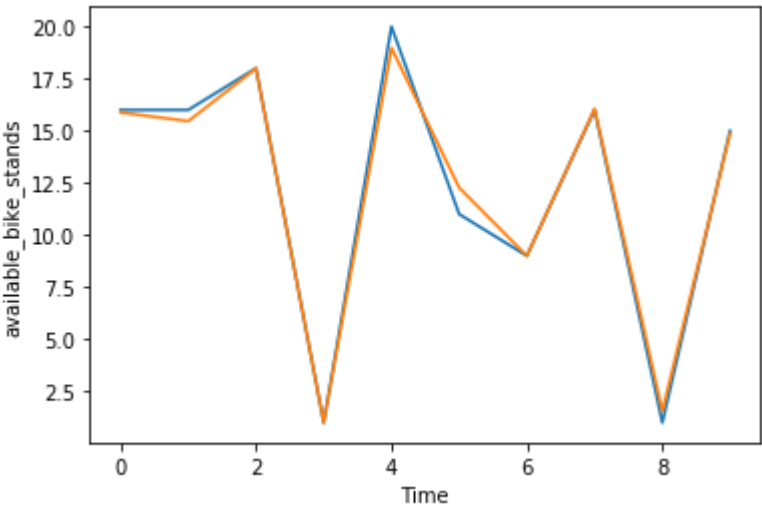
Station 17 available_bike_stands

MAE: 0.5313349225268176

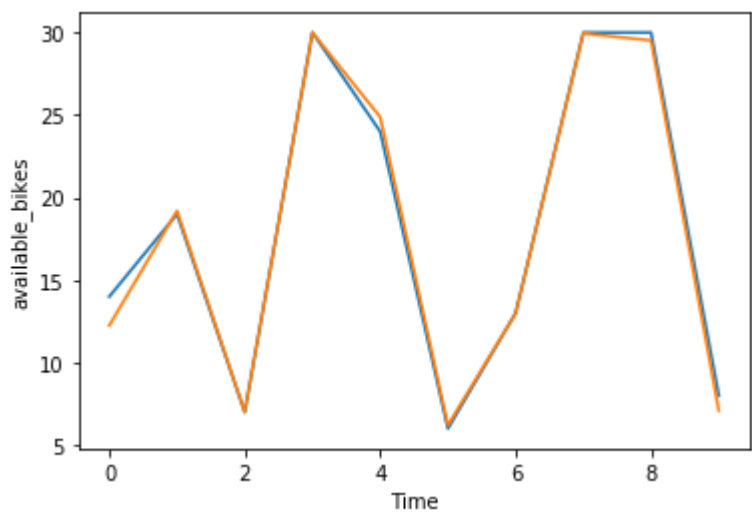
MSE: 0.7820735399284864

RMSE: 0.8843492183116839

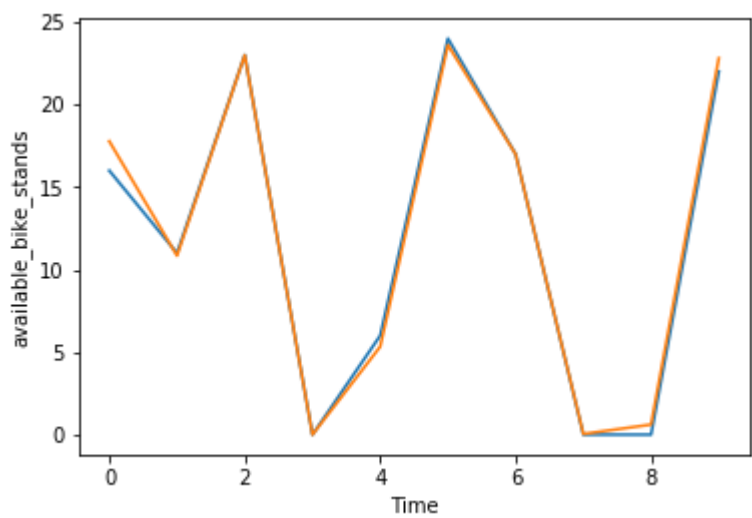
R2: 0.9686422421562314



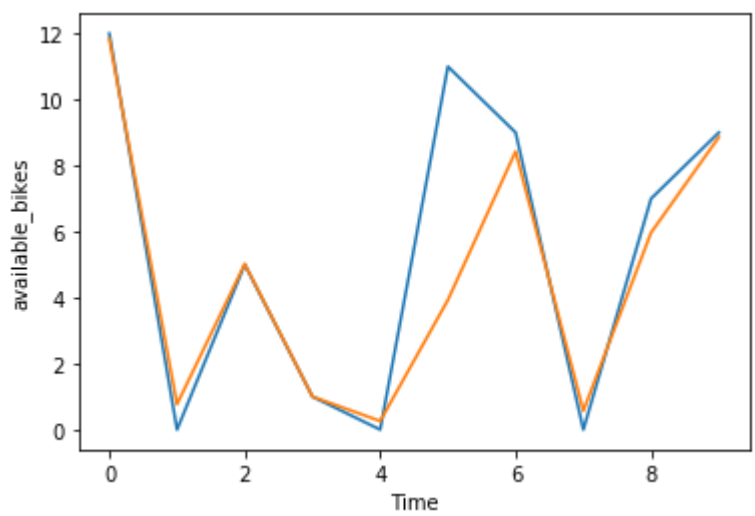
```
=====
=
Station 45      available_bikes
MAE:  0.4874016686531586
MSE:  0.7767464839094159
RMSE:  0.8813322210775094
R2:   0.9909773670922447
```



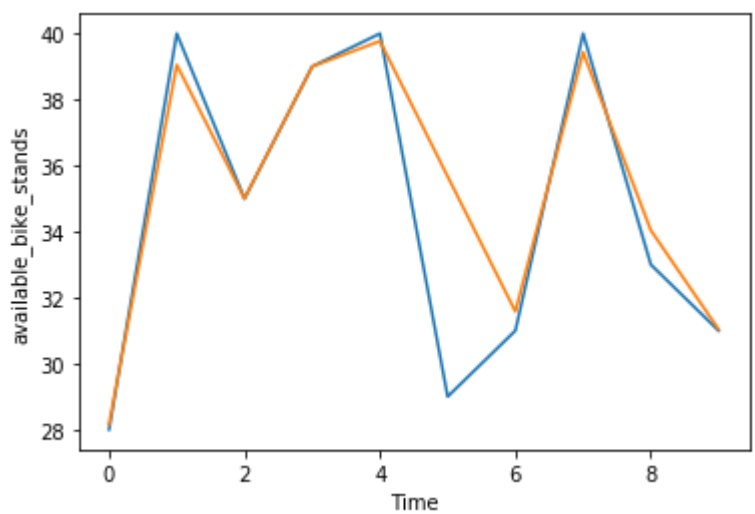
```
=====
=
Station 45      available_bike_stands
MAE:  0.4864362336114422
MSE:  0.7491423122765198
RMSE:  0.8655300758936803
R2:   0.9912570335387695
```



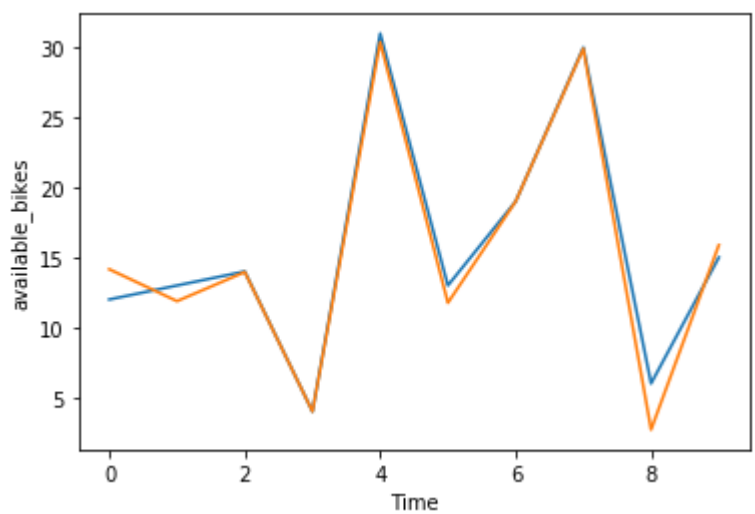
```
=====
=
Station 114     available_bikes
MAE:  0.8596901072705602
MSE:  3.286759952324195
RMSE:  1.812942346663069
R2:   0.9646263774566963
```



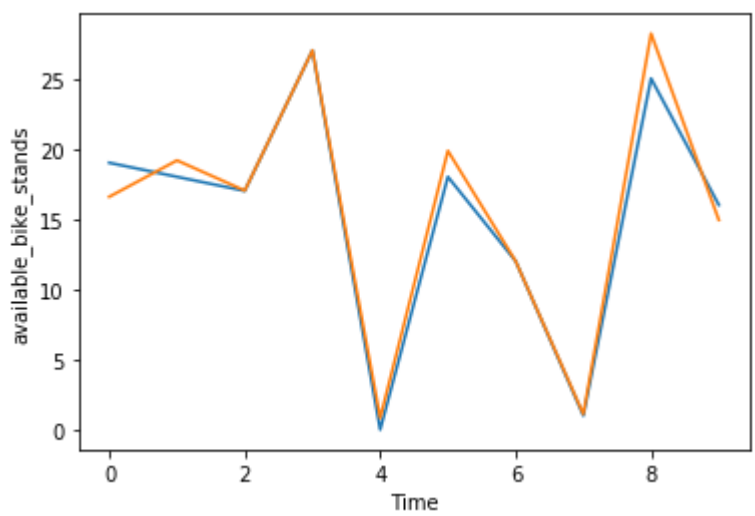
```
=====
=
Station 114      available_bike_stands
MAE:  0.8468057210965435
MSE:  3.1744969010727058
RMSE:  1.7817117895643801
R2:   0.9661468675784197
```



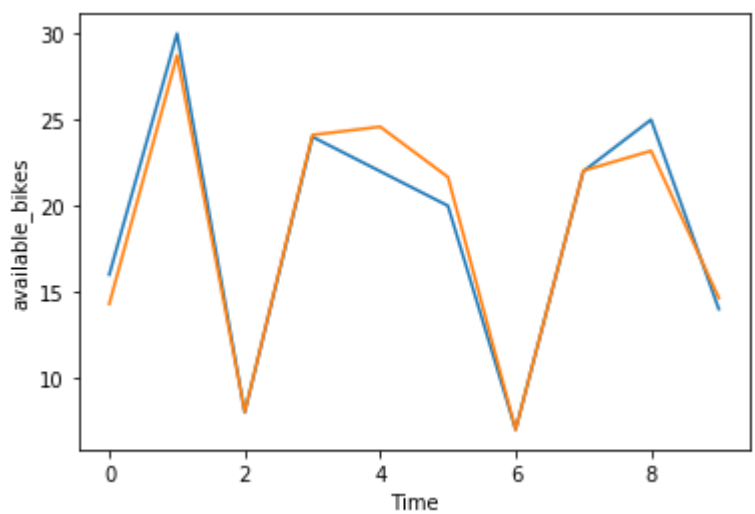
```
=====
=
Station 72      available_bikes
MAE:  0.8268295589988082
MSE:  2.227952443384982
RMSE:  1.492632722200938
R2:   0.9671051773532126
```



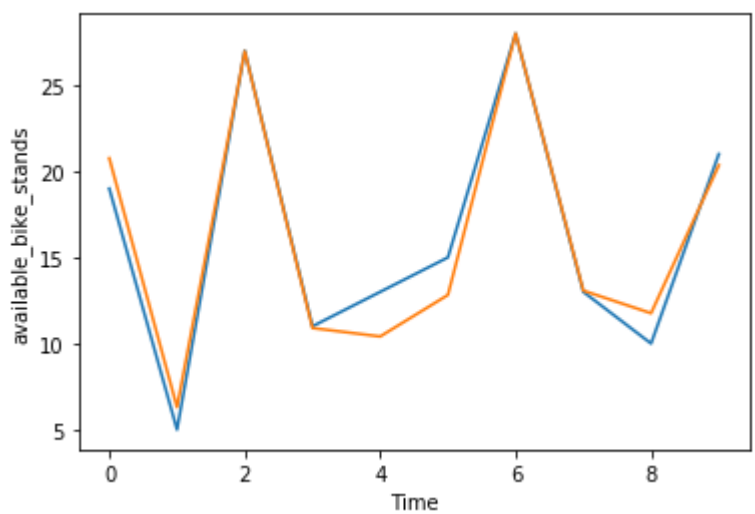
```
=====
=
Station 72      available_bike_stands
MAE:  0.8383790226460073
MSE:  2.2651530393325388
RMSE:  1.505042537383093
R2:   0.9665324388143823
```



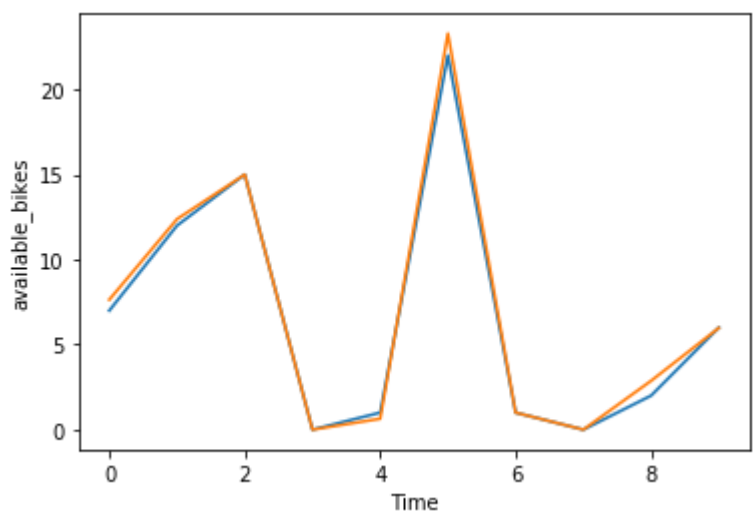
```
=====
=
Station 63      available_bikes
MAE:  0.771549463647199
MSE:  2.404068772348033
RMSE:  1.5505059730126916
R2:   0.9645127507253994
```



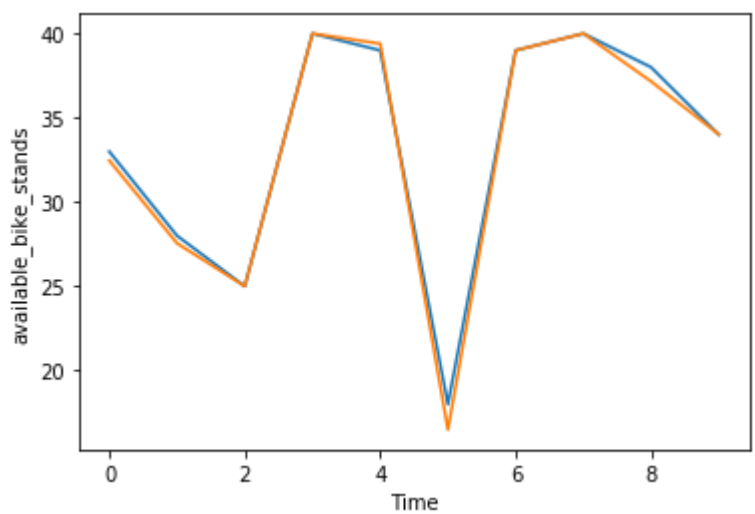
```
=====
=
Station 63      available_bike_stands
MAE:  0.7672705601907033
MSE:  2.3998500595947556
RMSE:  1.549144944669399
R2:   0.9646864167036009
```



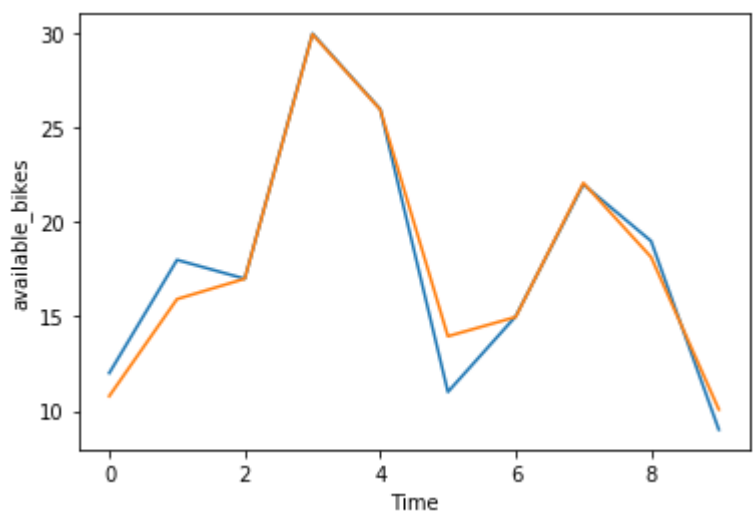
```
=====
=
Station 113     available_bikes
MAE:  0.470238379022646
MSE:  0.9352270560190704
RMSE:  0.9670713810361004
R2:   0.9916587415652145
```

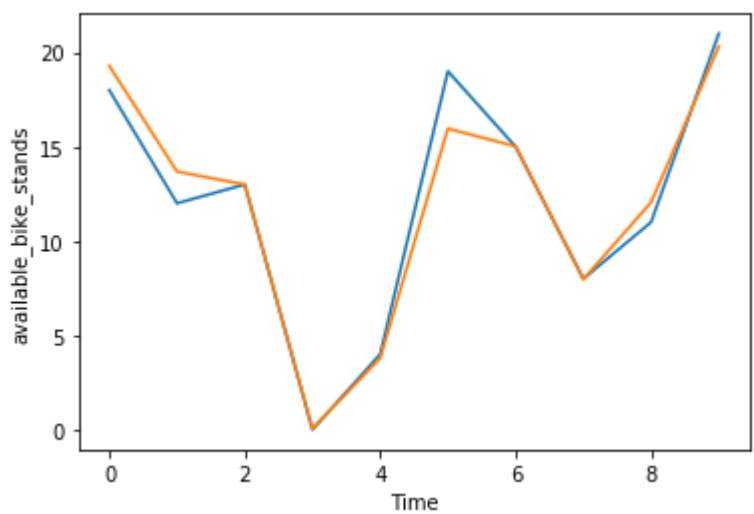
```
=====
=
Station 113      available_bike_stands
MAE:  0.4707747318235995
MSE:  0.9689814064362336
RMSE:  0.9843685318193759
R2:   0.9913911178969906
```



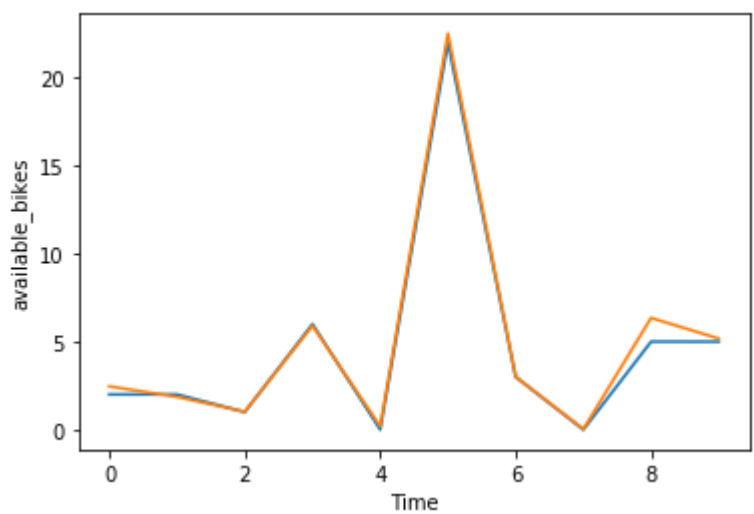
```
=====
=
Station 91      available_bikes
MAE:  1.0738736591179976
MSE:  3.8466162097735395
RMSE:  1.9612792278952886
R2:   0.9446131944041307
```



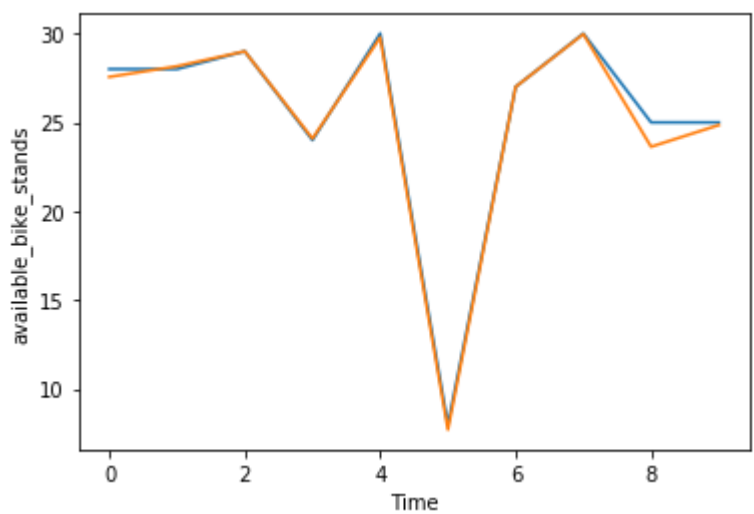
```
=====
=
Station 91      available_bike_stands
MAE:  1.083301549463647
MSE:  3.8536582836710367
RMSE:  1.963073682690244
R2:   0.9445936221812034
```



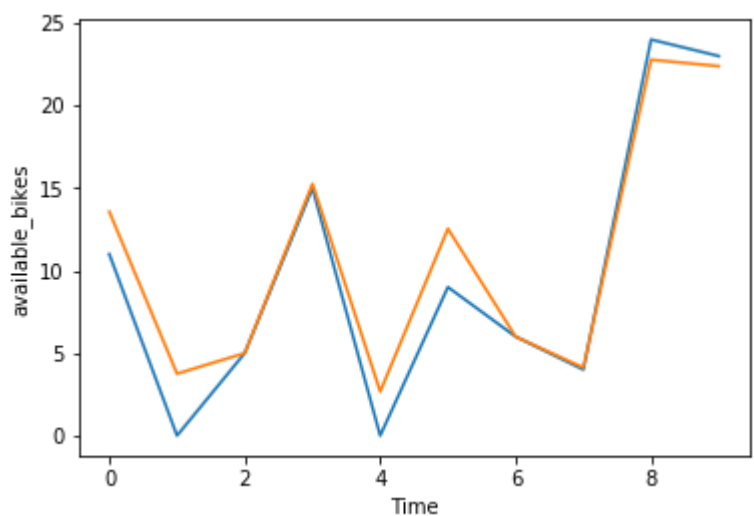
```
=====
=
Station 99      available_bikes
MAE:  0.48324195470798564
MSE:  0.966666746126341
RMSE:  0.9831921206592031
R2:   0.988325696502398
```



```
=====
=
Station 99      available_bike_stands
MAE:  0.47824791418355184
MSE:  0.948522884386174
RMSE:  0.9739213953837209
R2:   0.988567600773948
```



```
=====
=
Station 9      available_bikes
MAE:  1.4145411203814064
MSE:  5.532143027413587
RMSE:  2.3520508131019593
R2:   0.9079497820096207
```



=====

=

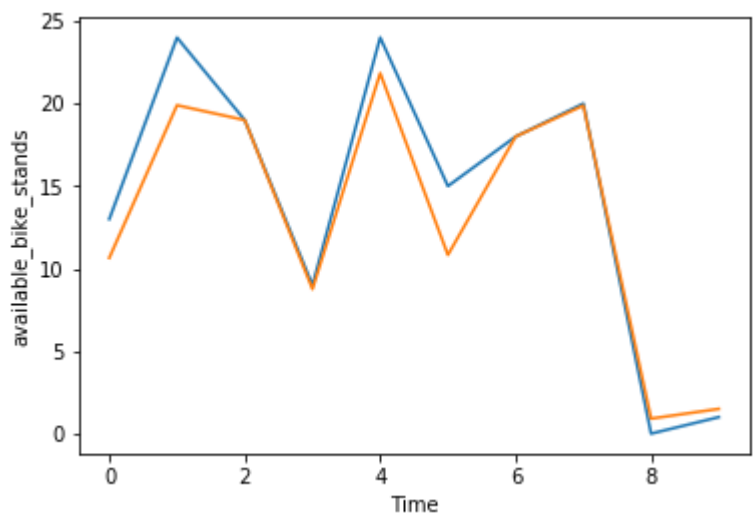
Station 9 available_bike_stands

MAE: 1.39927294398093

MSE: 5.49907663885578

RMSE: 2.3450110103911626

R2: 0.9094257974084871



=====

=

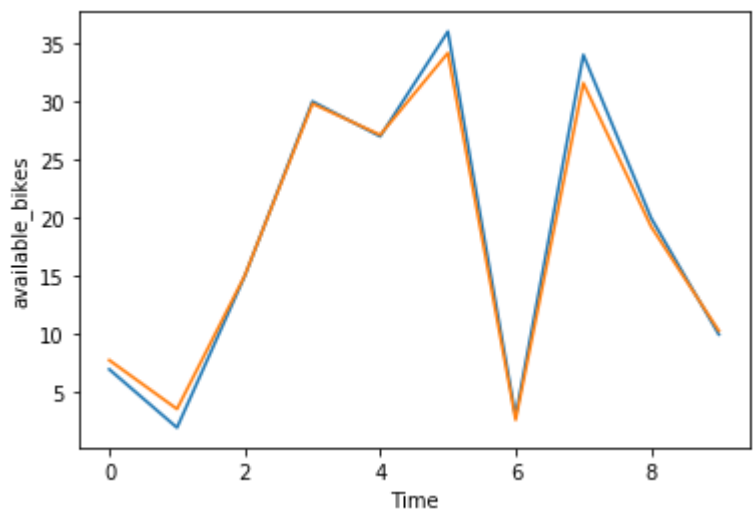
Station 67 available_bikes

MAE: 1.1365673420738975

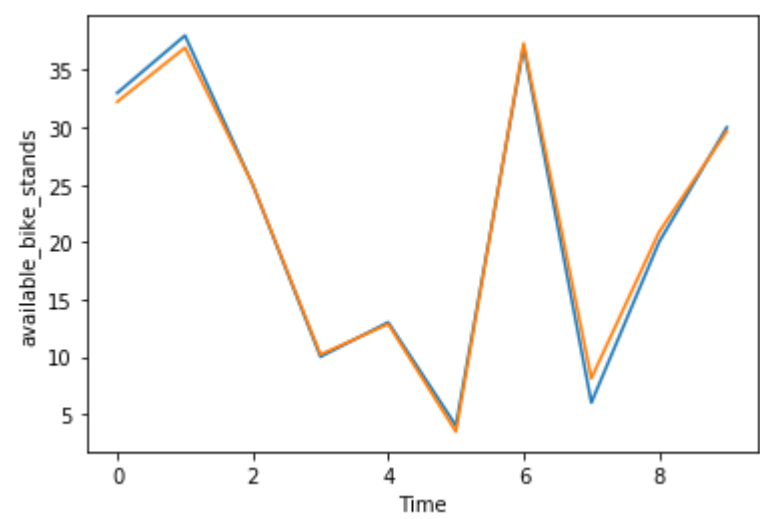
MSE: 5.153479380214541

RMSE: 2.270127613200311

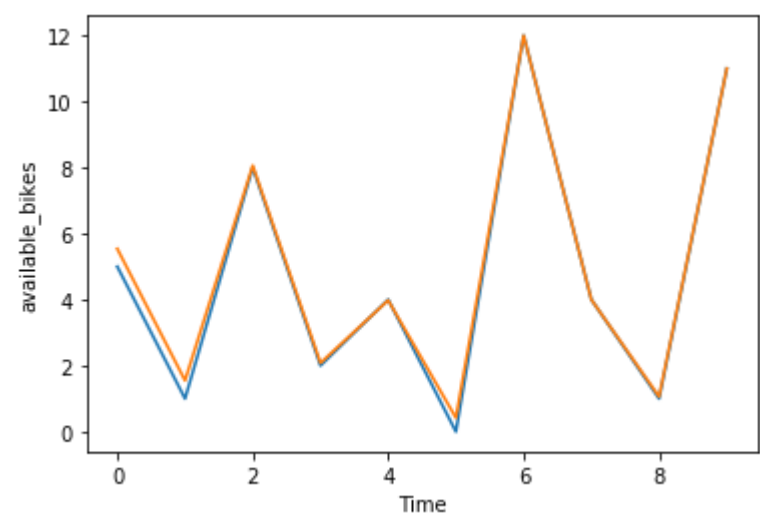
R2: 0.9525449301254625



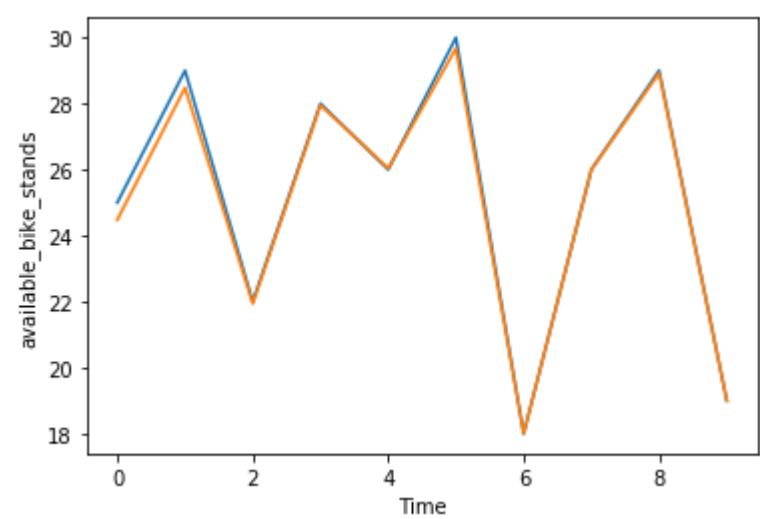
```
=====
=
Station 67      available_bike_stands
MAE:  1.1340643623361146
MSE:  5.345044338498213
RMSE:  2.3119351934036154
R2:   0.9516721528411412
```



```
=====
=
Station 116     available_bikes
MAE:  0.17349225268176402
MSE:  0.12668915375446962
RMSE:  0.3559341986301255
R2:   0.9893577810178631
```



```
=====
=
Station 116     available_bike_stands
MAE:  0.19005959475566161
MSE:  0.25065768772348035
RMSE:  0.5006572557383747
R2:   0.9790392328669874
```



=====

=

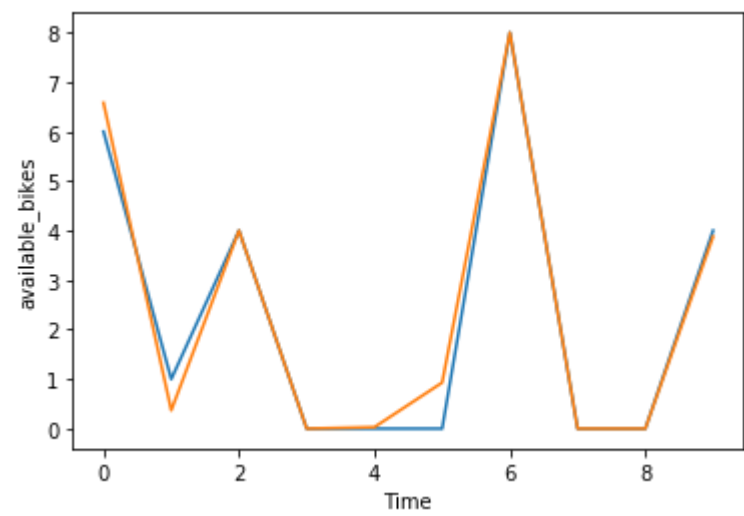
Station 55 available_bikes

MAE: 0.4285935637663886

MSE: 1.0899166865315852

RMSE: 1.0439907502136143

R2: 0.9881373669952668



=====

=

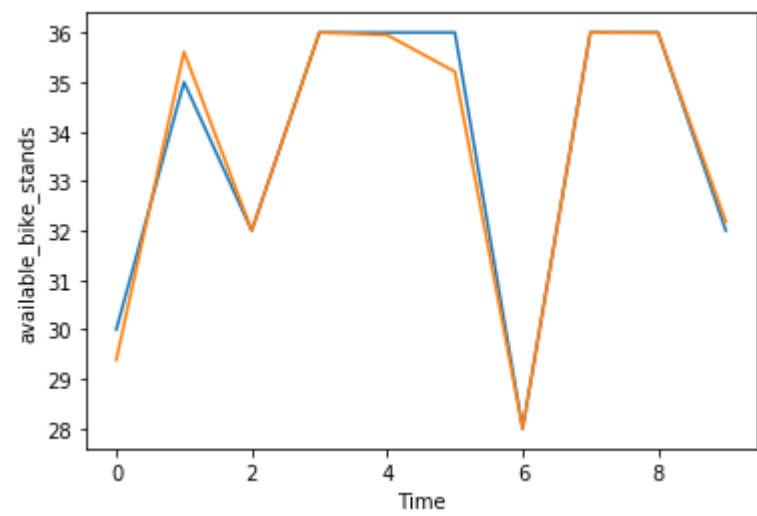
Station 55 available_bike_stands

MAE: 0.43202622169249094

MSE: 1.0956821215733015

RMSE: 1.046748356374779

R2: 0.9881037443421061



=====

=

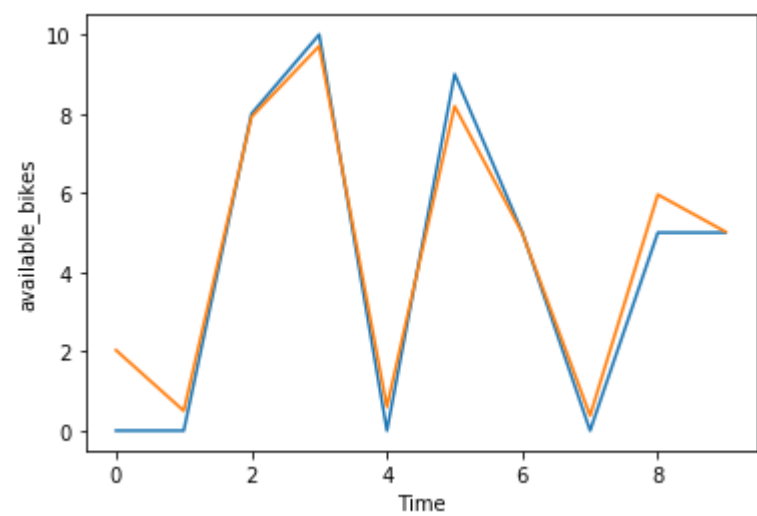
Station 62 available_bikes

MAE: 0.6193682955899881

MSE: 1.6196513706793803

RMSE: 1.2726552442352093

R2: 0.9850675896552382



=====

=

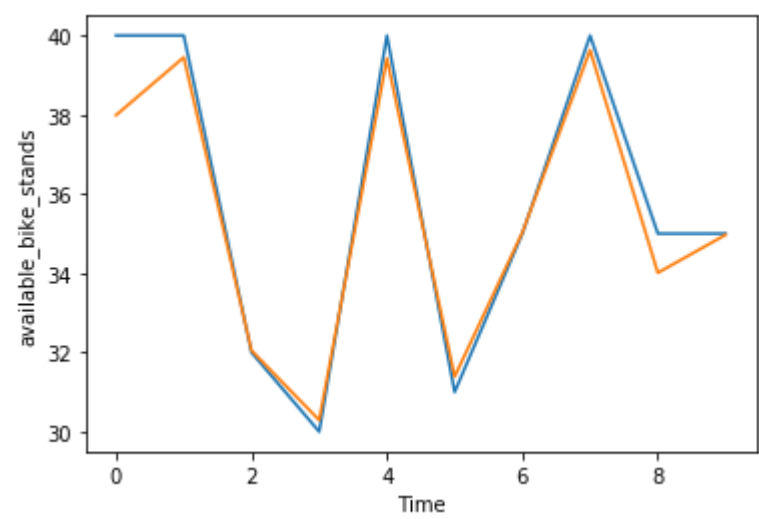
Station 62 available_bike_stands

MAE: 0.6213349225268175

MSE: 1.6013890345649582

RMSE: 1.2654600090737589

R2: 0.9854441706650546



=====

=

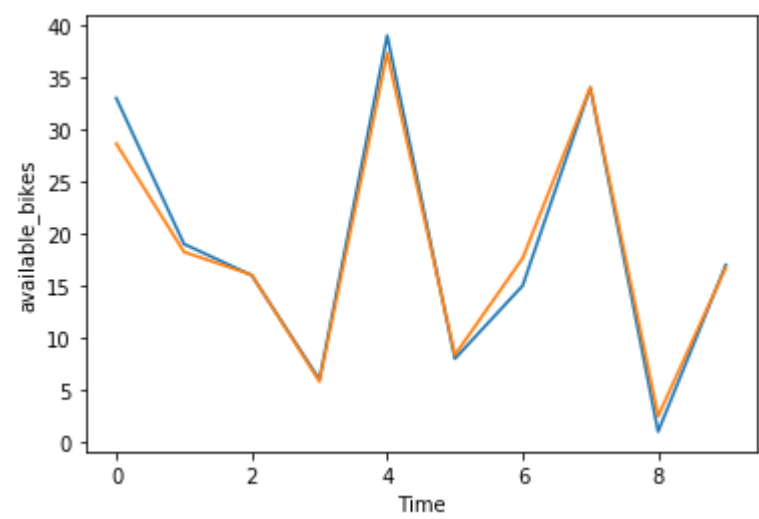
Station 5 available_bikes

MAE: 1.4021573301549461

MSE: 5.87868021454112

RMSE: 2.4245989801493195

R2: 0.9348794897386399



=====

=

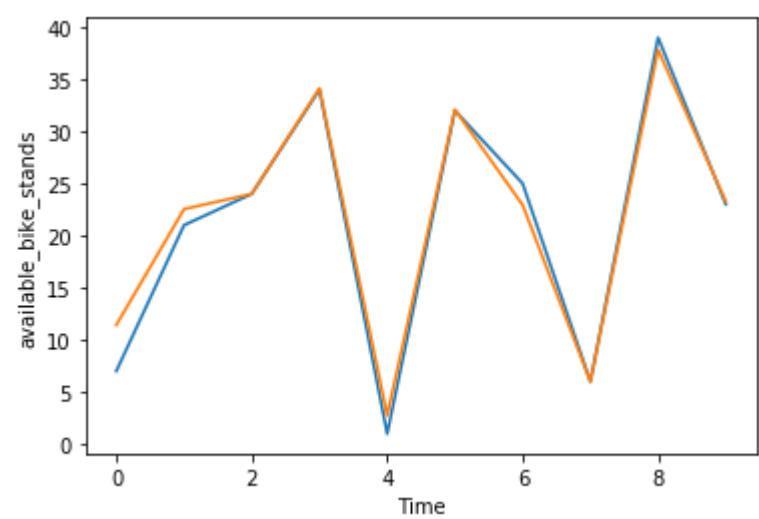
Station 5 available_bike_stands

MAE: 1.3985578069129916

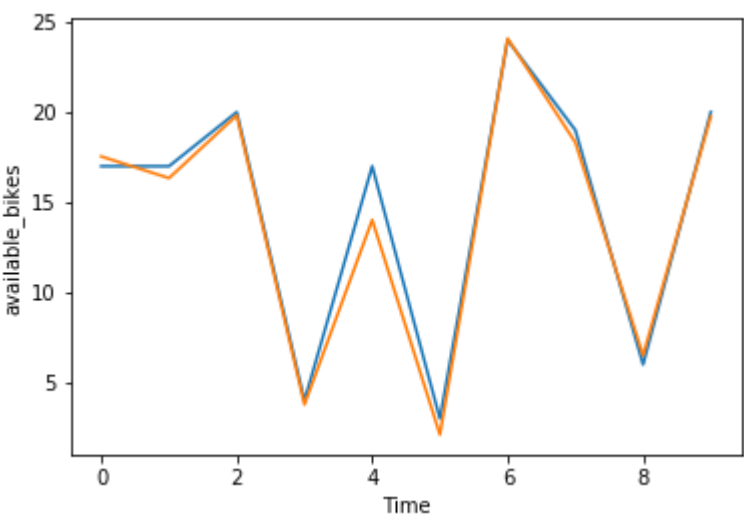
MSE: 5.83243611442193

RMSE: 2.4150437085945113

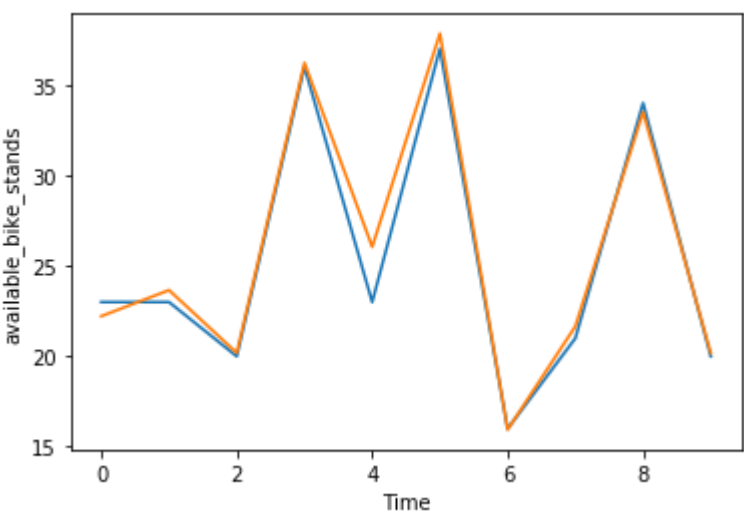
R2: 0.9354329255755063



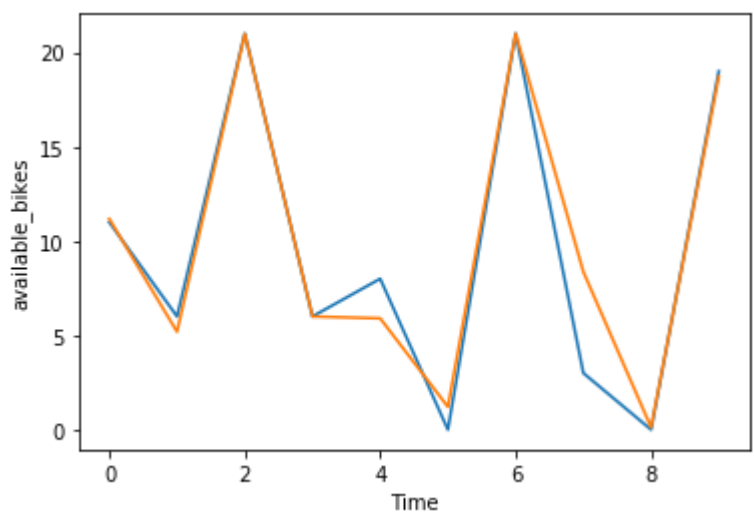
```
=====
=
Station 97      available_bikes
MAE:  0.7733015494636472
MSE:  2.6225964243146604
RMSE:  1.6194432451662701
R2:   0.9744781396369424
```



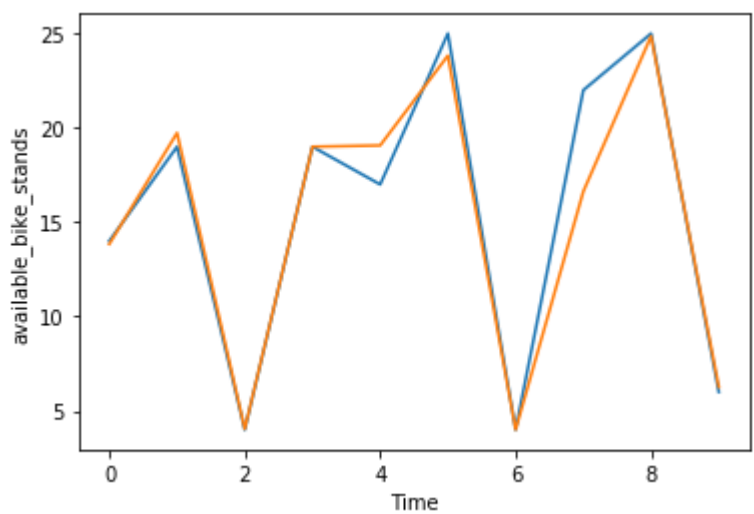
```
=====
=
Station 97      available_bike_stands
MAE:  0.7828128724672231
MSE:  2.6763637663885578
RMSE:  1.6359595858053944
R2:   0.9739554509008024
```



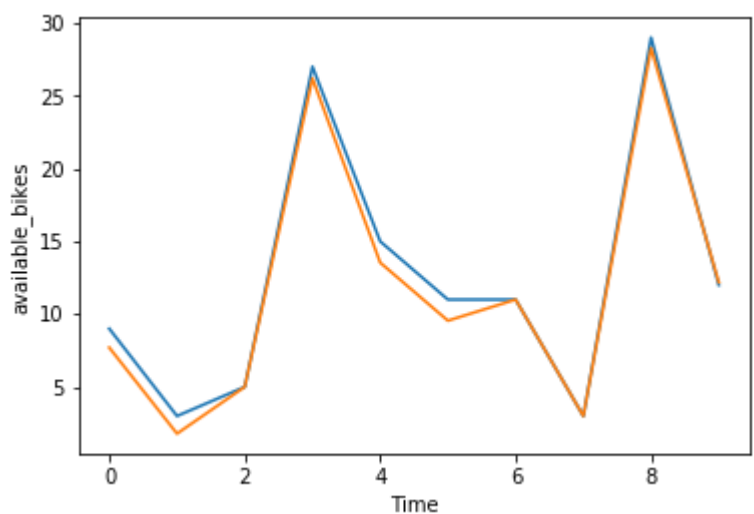
```
=====
=
Station 61      available_bikes
MAE:  0.721704410011919
MSE:  2.2394144219308703
RMSE:  1.496467314020213
R2:   0.9571933933851653
```



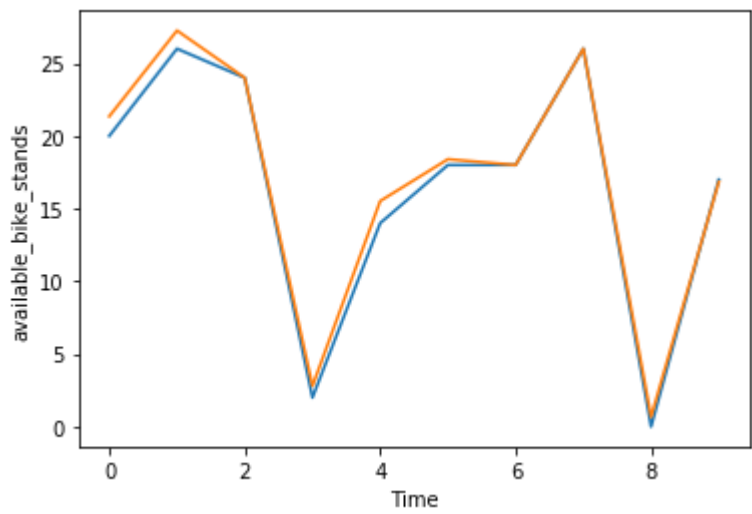
```
=====
=
Station 61      available_bike_stands
MAE:  0.716233611442193
MSE:  2.206773539928486
RMSE:  1.4855213024149085
R2:   0.9578409218417621
```



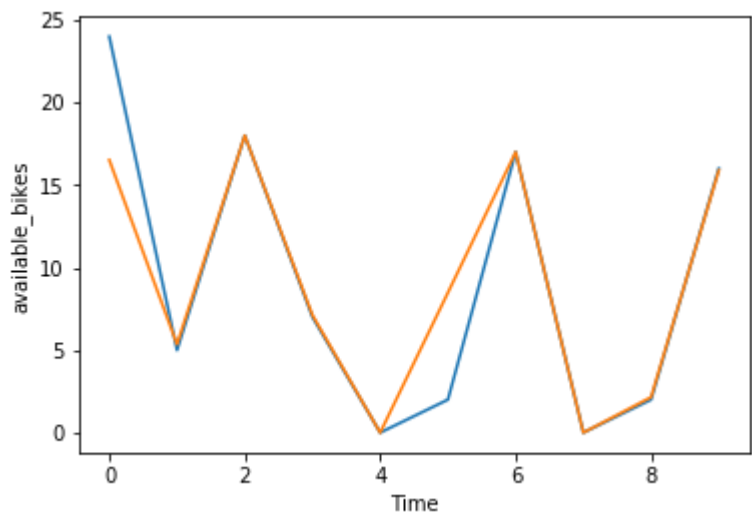
```
=====
=
Station 77      available_bikes
MAE:  0.6507985697258641
MSE:  1.6302576877234805
RMSE:  1.2768154477932512
R2:   0.9803419906843891
```



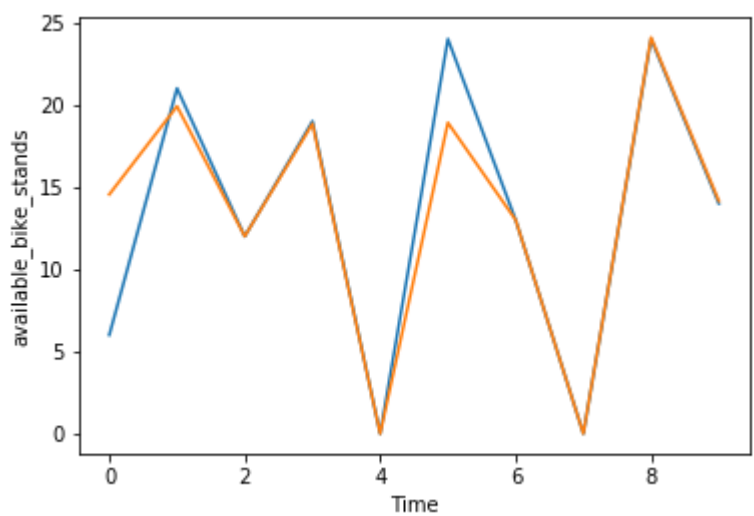

```
=====
=
Station 77      available_bike_stands
MAE:  0.6526698450536355
MSE:  1.6439381406436235
RMSE:  1.282161511137978
R2:   0.9801792730416893
```



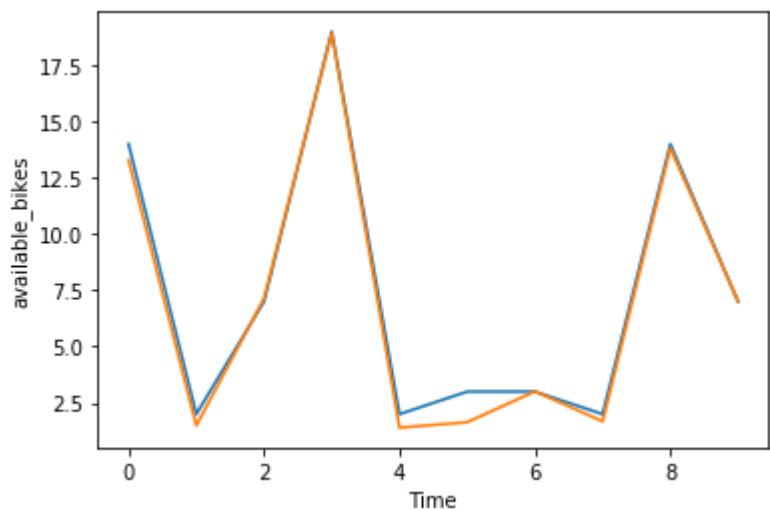
```
=====
=
Station 73      available_bikes
MAE:  0.5440286054827176
MSE:  1.2326398092967819
RMSE:  1.1102431307136207
R2:   0.9804548572531431
```



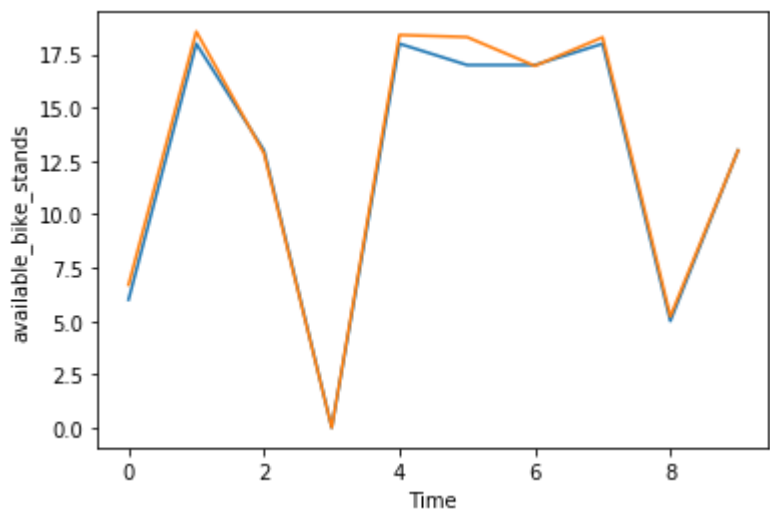
```
=====
=
Station 73      available_bike_stands
MAE:  0.5348748510131108
MSE:  1.3623804529201426
RMSE:  1.1672105435268063
R2:   0.9812779289170239
```



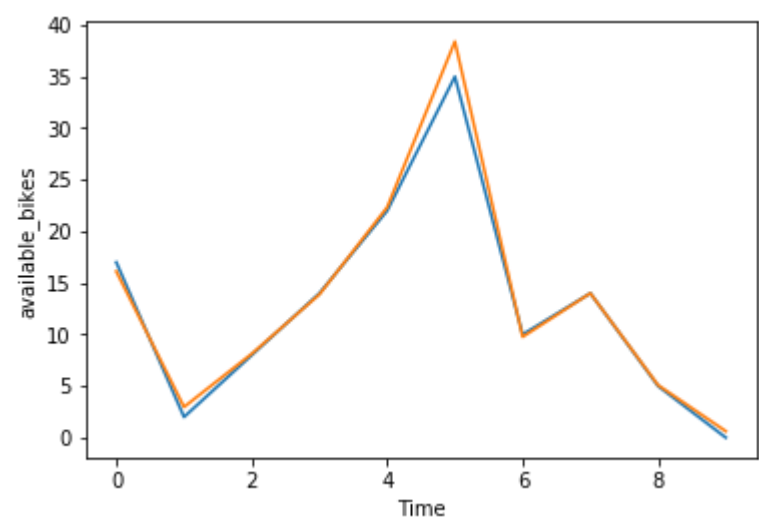
```
=====
=
Station 4      available_bikes
MAE:  0.5483790226460071
MSE:  0.8411724672228844
RMSE:  0.9171545492570401
R2:   0.9769507354663685
```



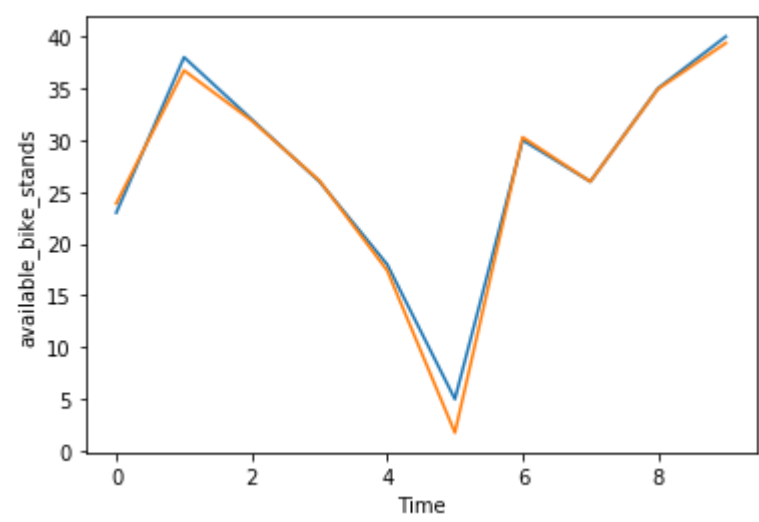
```
=====
=
Station 4      available_bike_stands
MAE:  0.550715137067938
MSE:  0.8593607866507748
RMSE:  0.9270171447447856
R2:   0.9773460814684386
```



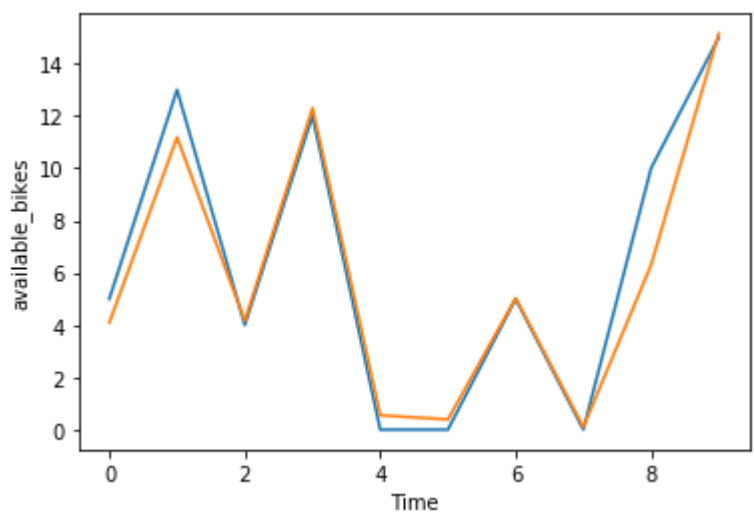
```
=====
=
Station 49      available_bikes
MAE:  1.0199046483909417
MSE:  3.2998064362336117
RMSE:  1.8165369350039684
R2:   0.9716577236774687
```



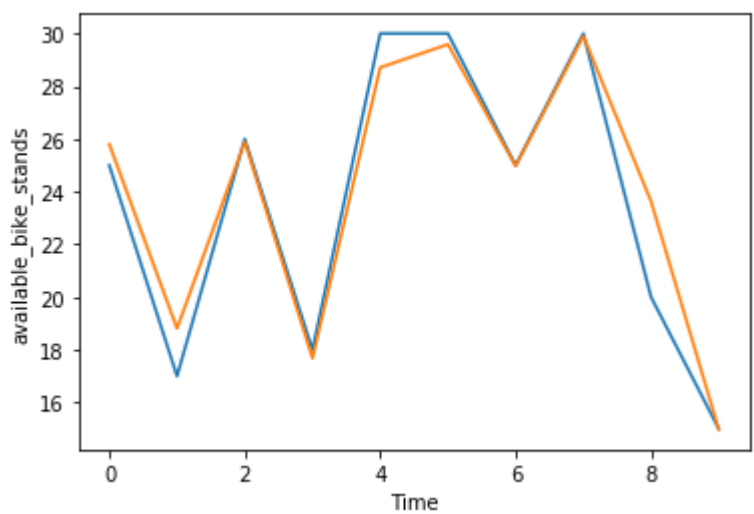
```
=====
=
Station 49      available_bike_stands
MAE:  1.0343504171632896
MSE:  3.3348879618593563
RMSE:  1.8261675612767183
R2:   0.971446940480988
```



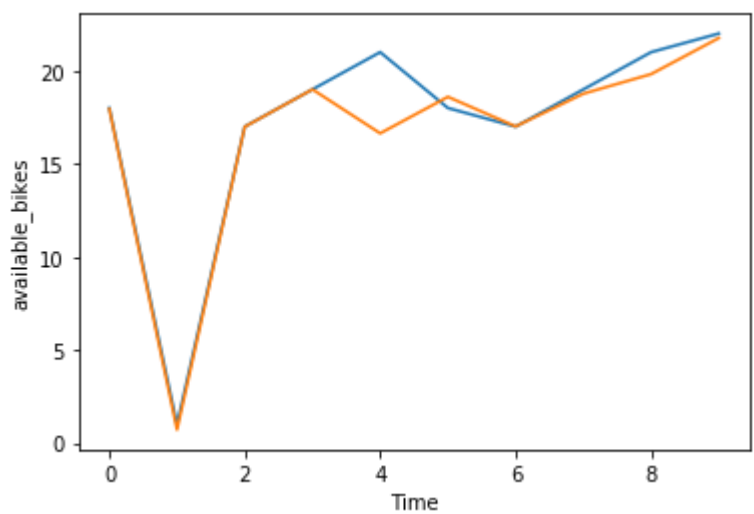
```
=====
=
Station 19      available_bikes
MAE:  1.1503456495828368
MSE:  4.03970989272944
RMSE:  2.009902956047739
R2:   0.9501749631152996
```



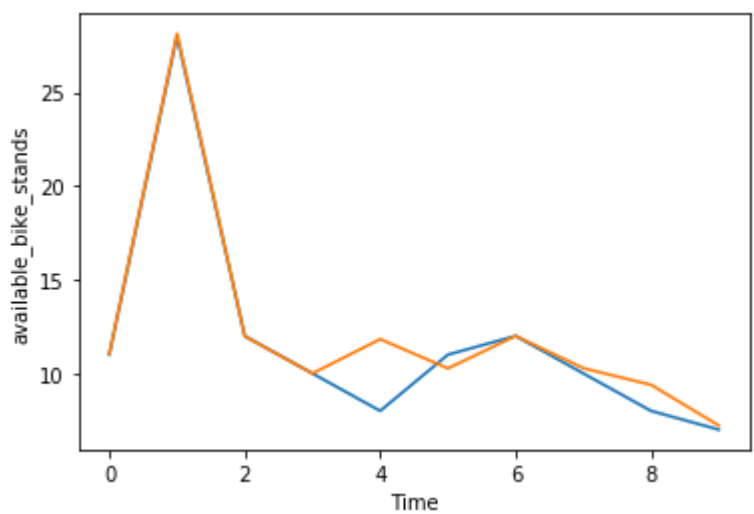
```
=====
=
Station 19      available_bike_stands
MAE:  1.1546483909415972
MSE:  4.064924791418355
RMSE:  2.016165864064352
R2:   0.9508767206992206
```



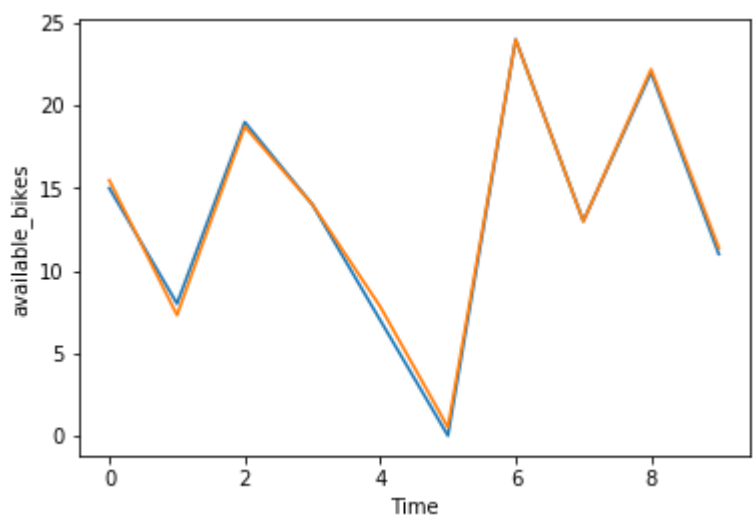
```
=====
=
Station 7      available_bikes
MAE:  0.597497020262217
MSE:  2.0475904648390943
RMSE:  1.430940412749285
R2:   0.9674274129589431
```



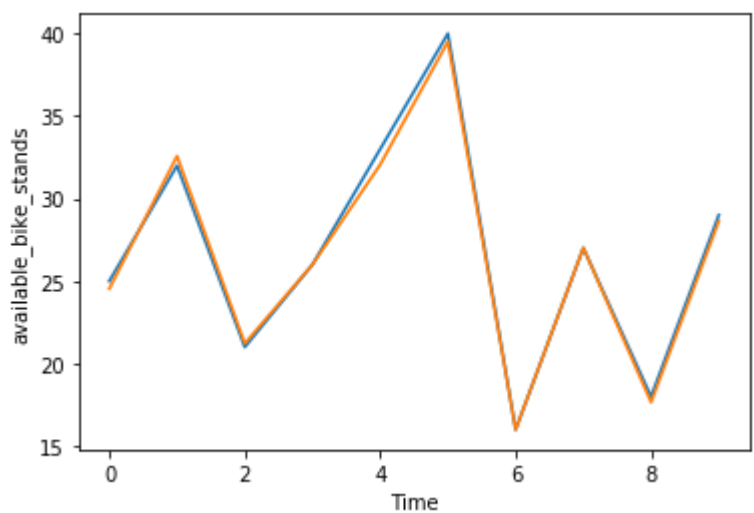
```
=====
=
Station 7      available_bike_stands
MAE:  0.6038140643623361
MSE:  2.079112038140644
RMSE:  1.4419126319374014
R2:   0.9667477134902078
```



```
=====
=
Station 102      available_bikes
MAE:  0.6225625744934445
MSE:  1.9834575685339693
RMSE:  1.4083527855384705
R2:   0.9624124055576976
```



```
=====
=
Station 102      available_bike_stands
MAE:  0.6220023837902264
MSE:  1.975424791418355
RMSE:  1.405498058133968
R2:   0.9627415928796174
```



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=

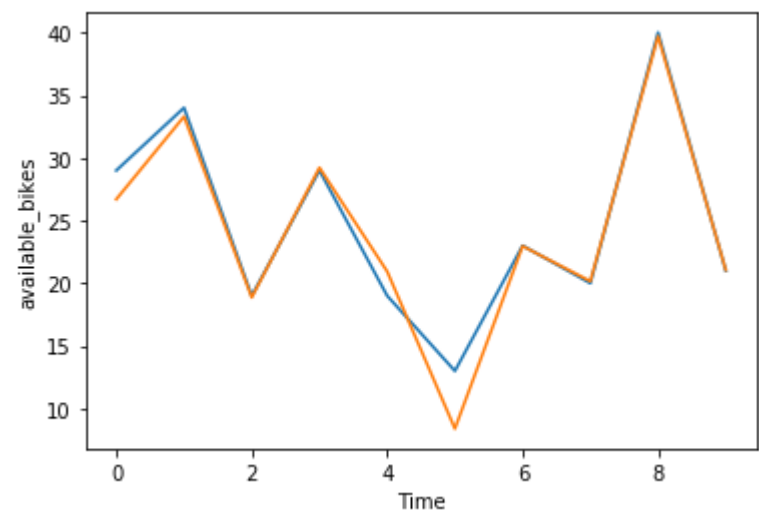
Station 38 available_bikes

MAE: 1.0218355184743741

MSE: 2.8631938021454117

RMSE: 1.6920974564561617

R2: 0.9700051983371422



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=

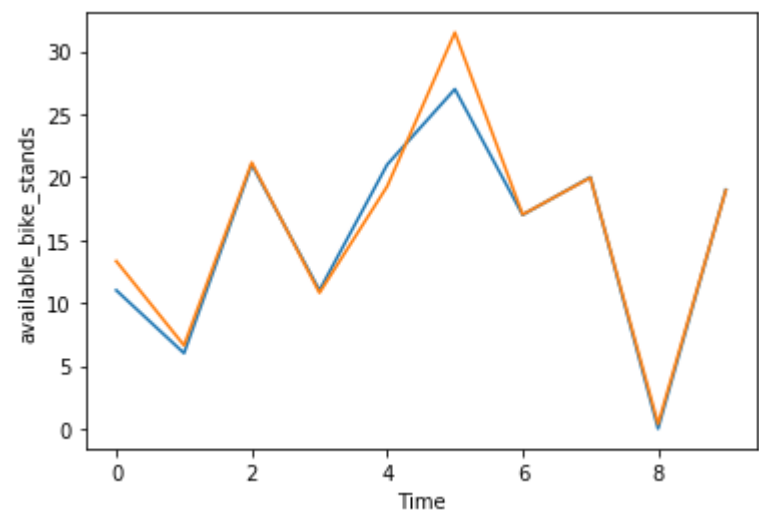
Station 38 available_bike_stands

MAE: 1.01342073897497

MSE: 2.8769137067938026

RMSE: 1.6961467232506162

R2: 0.9697272849560455



=====

=

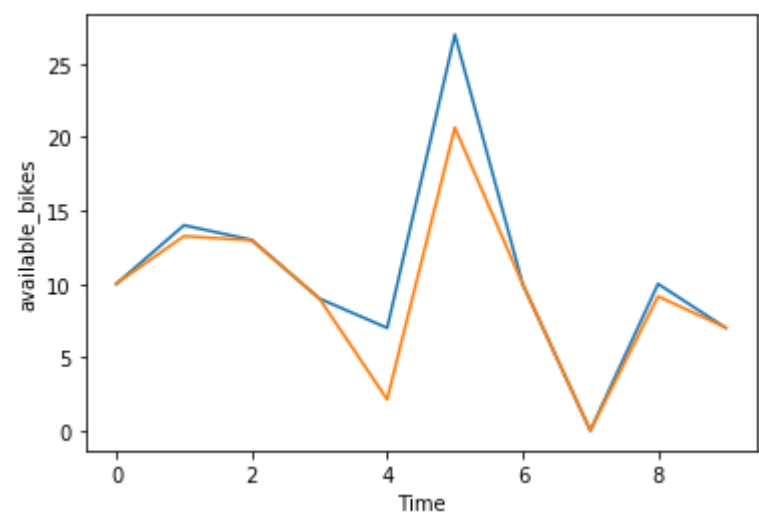
Station 53 available_bikes

MAE: 0.6145649582836711

MSE: 2.0473444576877236

RMSE: 1.4308544502106857

R2: 0.976616507273524



=====

=

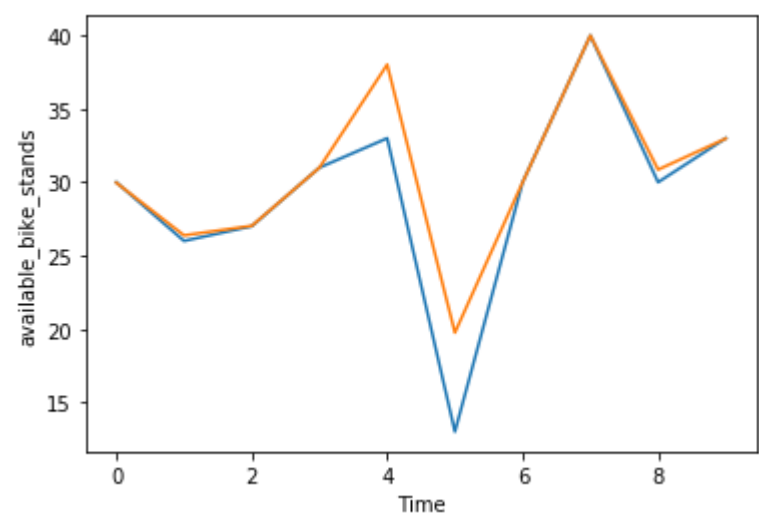
Station 53 available_bike_stands

MAE: 0.6227890345649583

MSE: 2.0966200238379025

RMSE: 1.4479710024161059

R2: 0.9764411934666729



=====

=

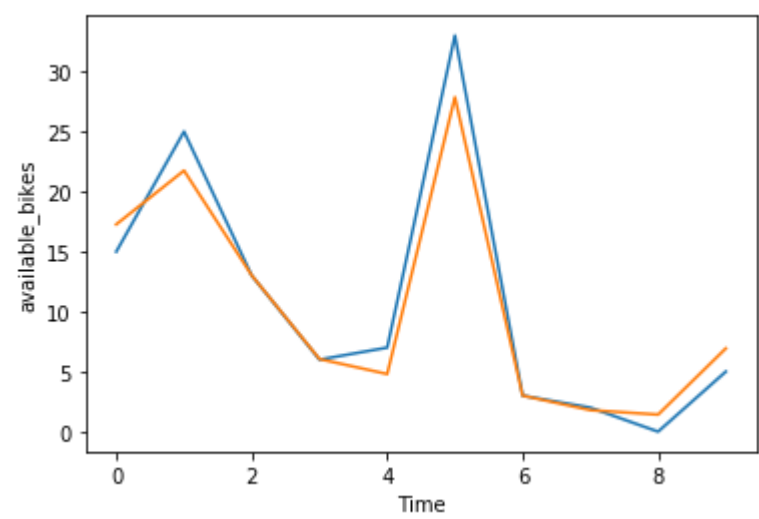
Station 58 available_bikes

MAE: 1.1886412395709178

MSE: 4.954091179976162

RMSE: 2.225778780556631

R2: 0.9499251981825803



=====

=

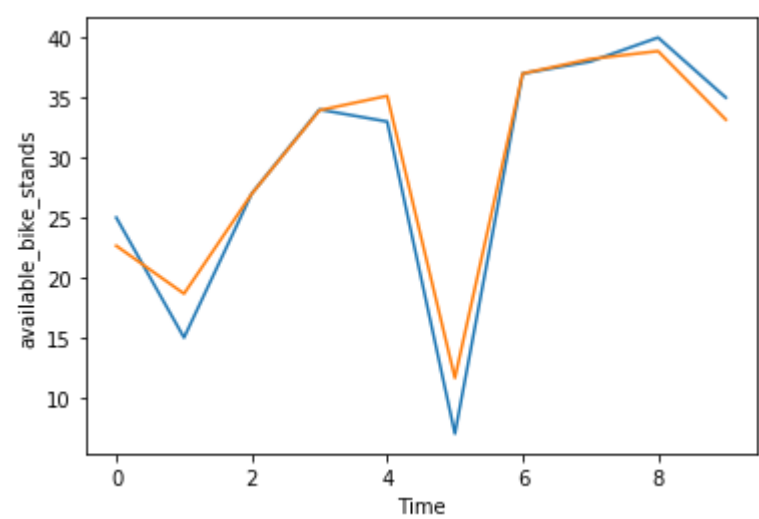
Station 58 available_bike_stands

MAE: 1.1976996424314659

MSE: 5.007670441001191

RMSE: 2.2377824829507427

R2: 0.9498293447712037



=====

=

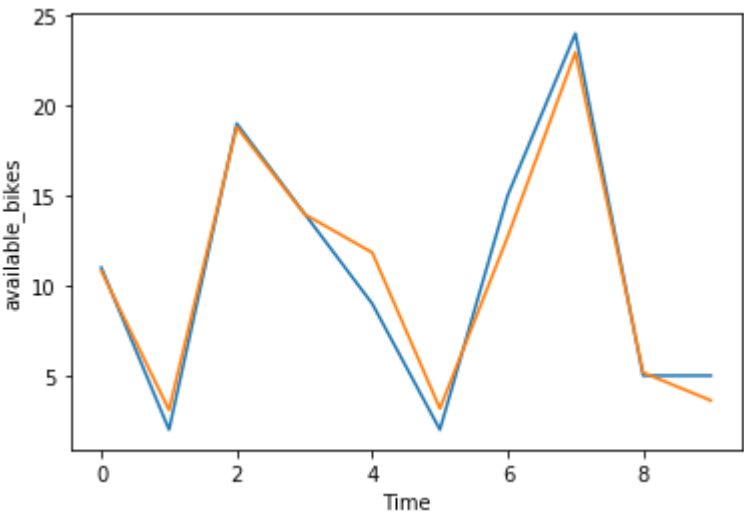
Station 66 available_bikes

MAE: 1.2096305125148985

MSE: 4.591958998808105

RMSE: 2.1428856709605637

R2: 0.9428833487523267



=====

=

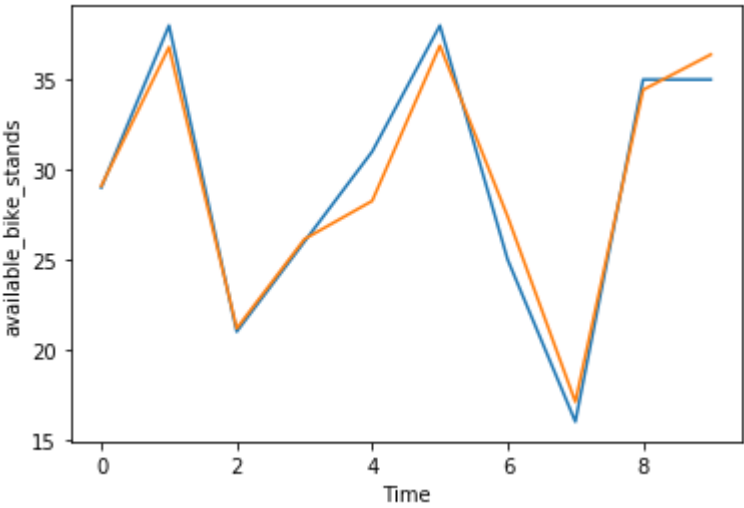
Station 66 available_bike_stands

MAE: 1.2327771156138263

MSE: 4.661125148986888

RMSE: 2.1589639063650155

R2: 0.9441261959119835



=====

=

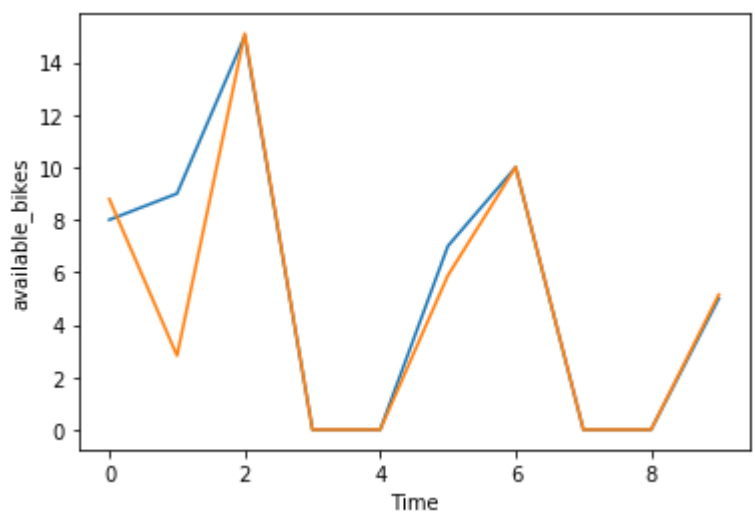
Station 104 available_bikes

MAE: 0.38501787842669843

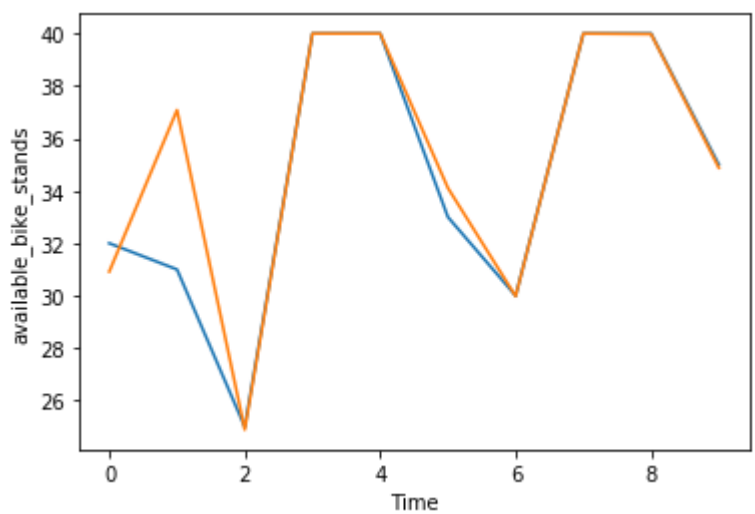
MSE: 0.981415852205006

RMSE: 0.9906643489118835

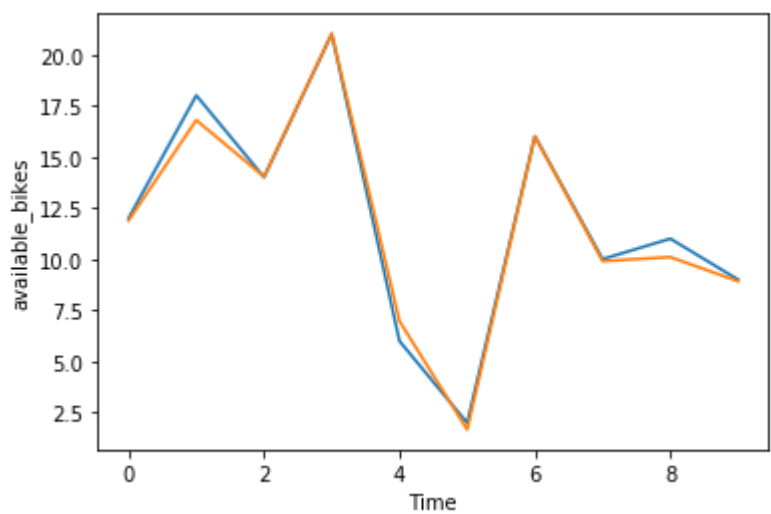
R2: 0.9692604775595095



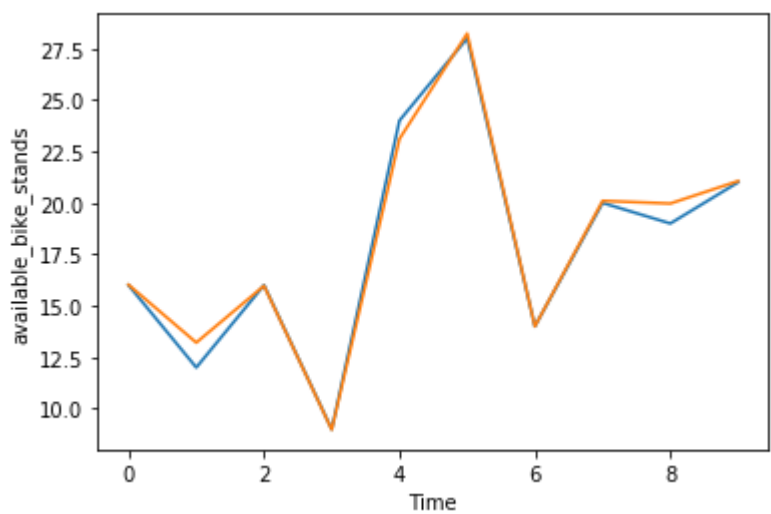
```
=====
=
Station 104      available_bike_stands
MAE:  0.394123957091776
MSE:  1.0213429082240764
RMSE:  1.0106151137916335
R2:   0.968626272237021
```



```
=====
=
Station 101      available_bikes
MAE:  0.6317163289630514
MSE:  1.2162573301549464
RMSE:  1.1028405733173523
R2:   0.976544896808941
```

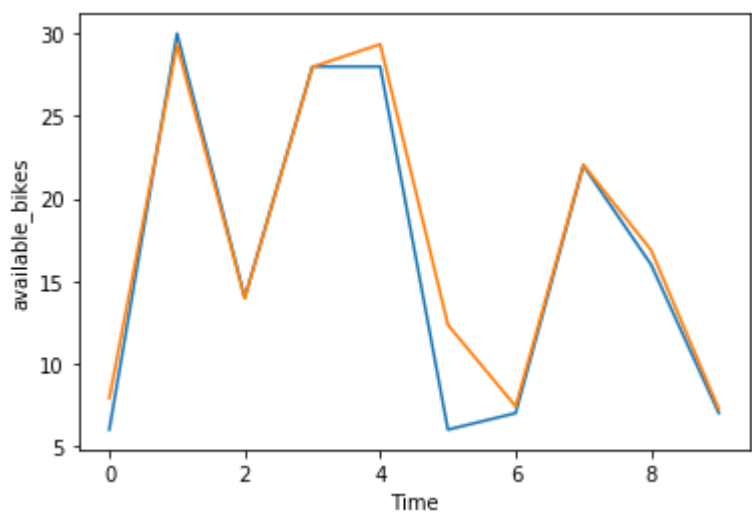


```
=====
=
Station 101      available_bike_stands
MAE:  0.6335041716328963
MSE:  1.2894129916567343
RMSE:  1.1355232237416961
R2:   0.9751871402231231
```



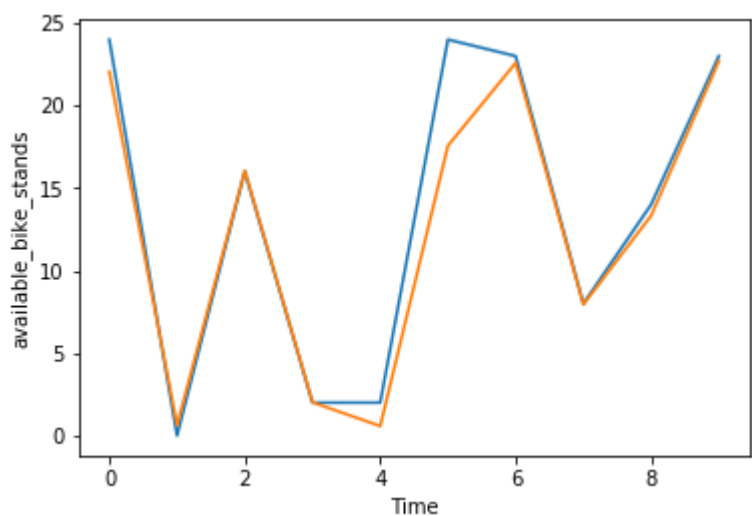
=====

```
=
Station 115      available_bikes
MAE:  0.9175566150178783
MSE:  2.5464053635280095
RMSE:  1.5957460209970789
R2:   0.9698687270216602
```



=====

```
=
Station 115      available_bike_stands
MAE:  0.9190703218116806
MSE:  2.5520307508939215
RMSE:  1.5975076684929939
R2:   0.9697088112158609
```



=====

=

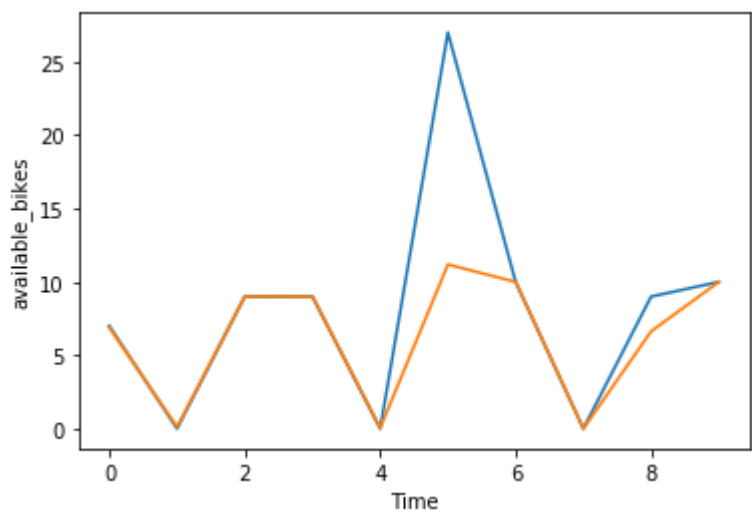
Station 47 available_bikes

MAE: 0.5770679380214542

MSE: 2.70546126340882

RMSE: 1.6448286425670062

R2: 0.9789499796698844



=====

=

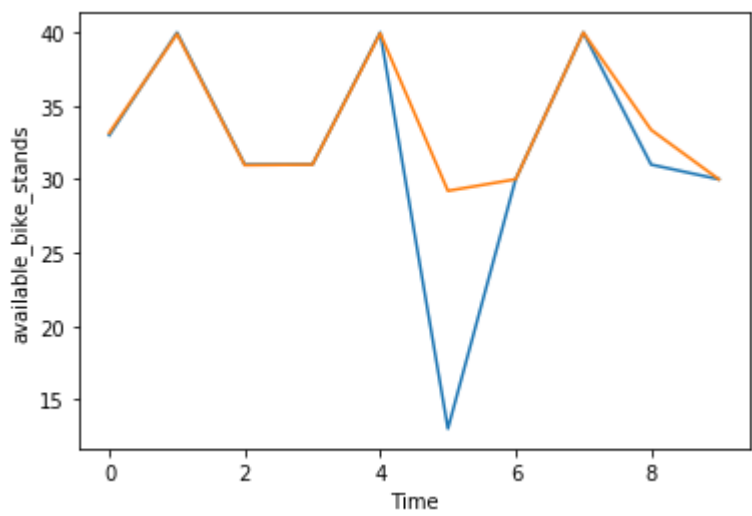
Station 47 available_bike_stands

MAE: 0.5809296781883194

MSE: 2.7742238379022646

RMSE: 1.6656001434624892

R2: 0.9784980351923969



=====

=

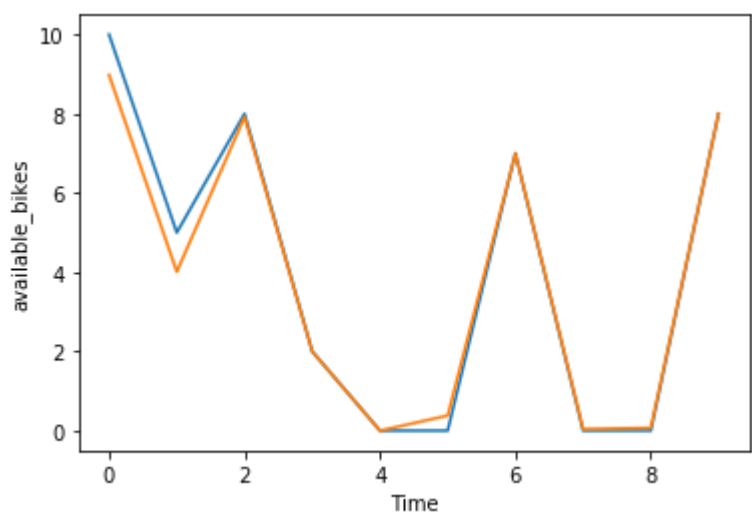
Station 117 available_bikes

MAE: 0.43169249106078667

MSE: 2.531648510131109

RMSE: 1.5911154923923998

R2: 0.9714355776704148



=====

=

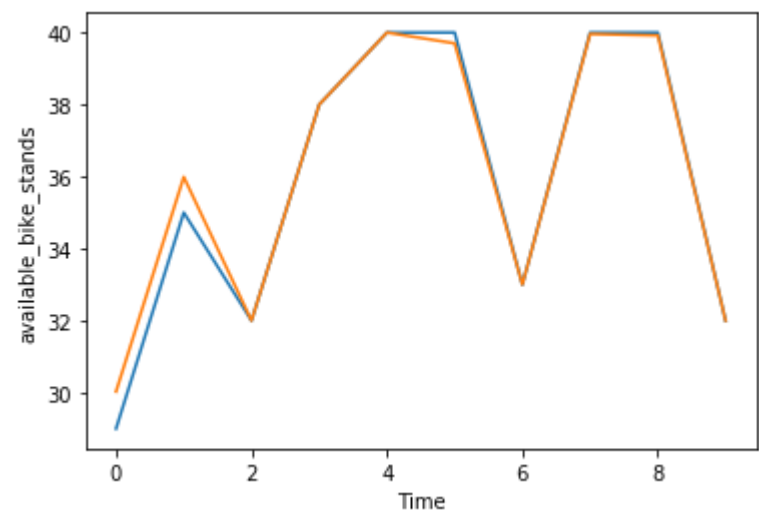
Station 117 available_bike_stands

MAE: 0.43488676996424314

MSE: 2.4947152562574493

RMSE: 1.5794667632645676

R2: 0.9718763956780342



=====

=

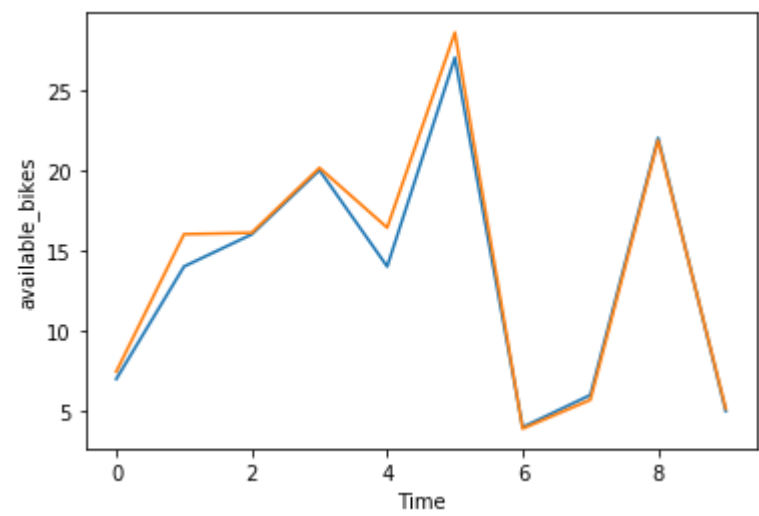
Station 8 available_bikes

MAE: 0.8949106078665077

MSE: 2.3891402860548276

RMSE: 1.545684407003845

R2: 0.9631012023550939



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=

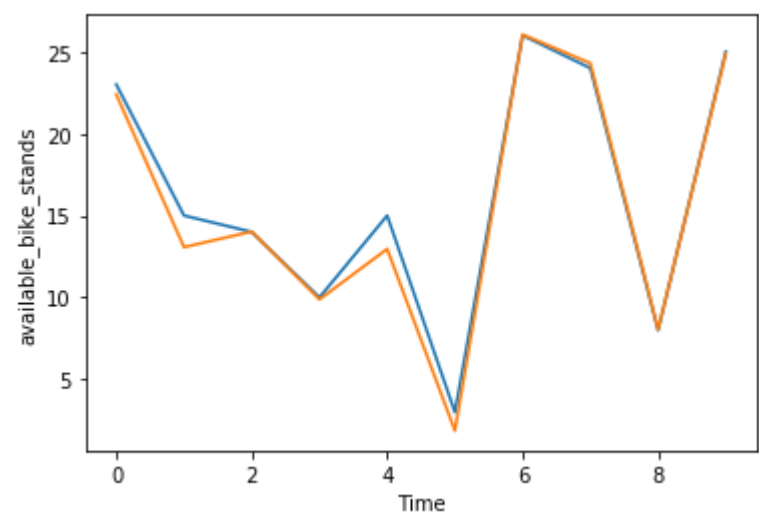
Station 8 available_bike_stands

MAE: 0.8839809296781884

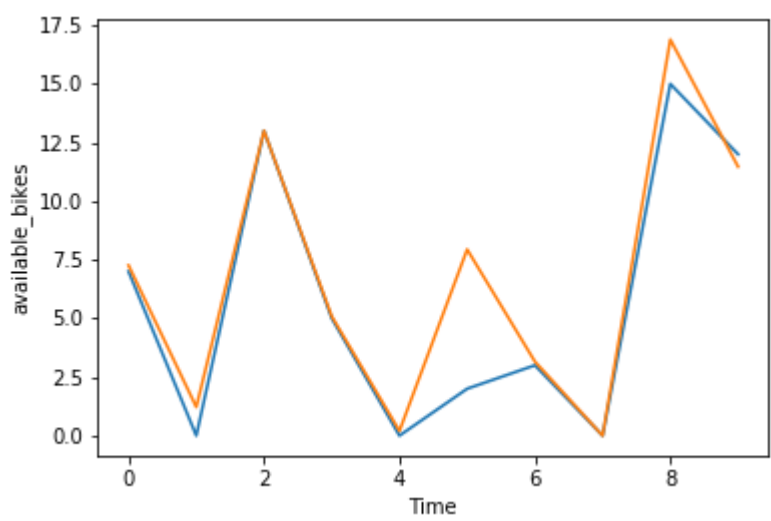
MSE: 2.354858402860548

RMSE: 1.5345547897877574

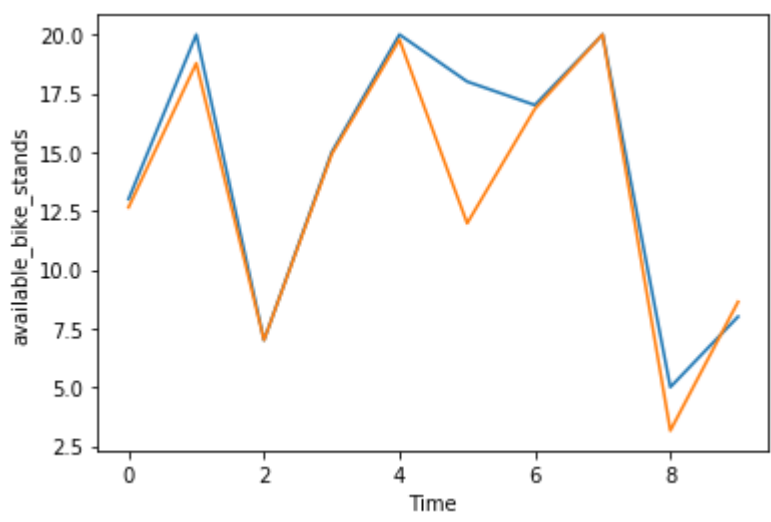
R2: 0.9636159349383139



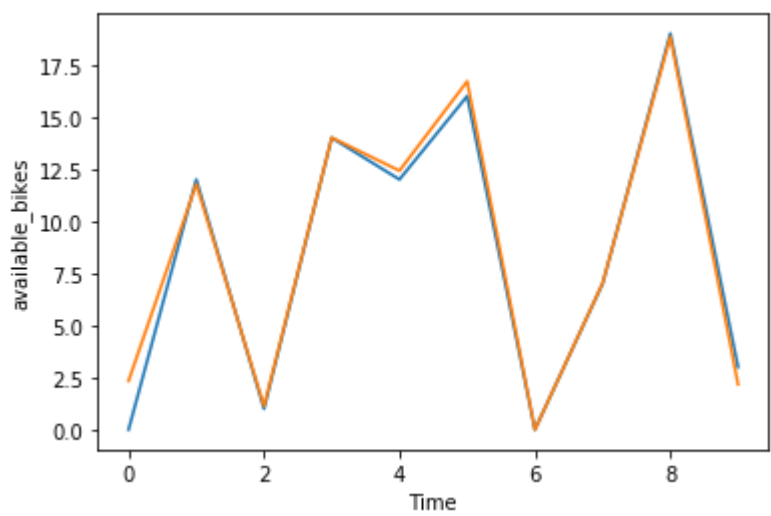
```
=====
=
Station 27      available_bikes
MAE:  0.6857806912991656
MSE:  1.5190325387365913
RMSE:  1.2324903807886662
R2:   0.9666894918491227
```



```
=====
=
Station 27      available_bike_stands
MAE:  0.6930631704410012
MSE:  1.5486488676996424
RMSE:  1.2444472137056044
R2:   0.9661803218738668
```

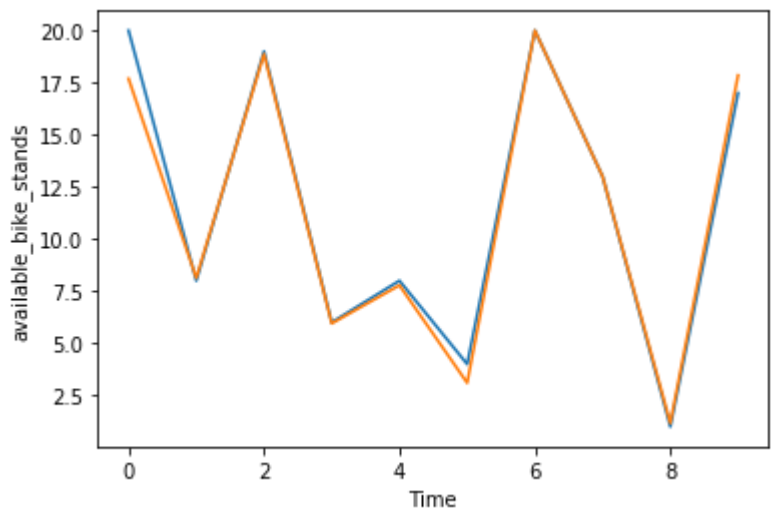


```
=====
=
Station 16      available_bikes
MAE:  0.5752920143027414
MSE:  1.0575393325387366
RMSE:  1.028367314017096
R2:   0.968425136216263
```



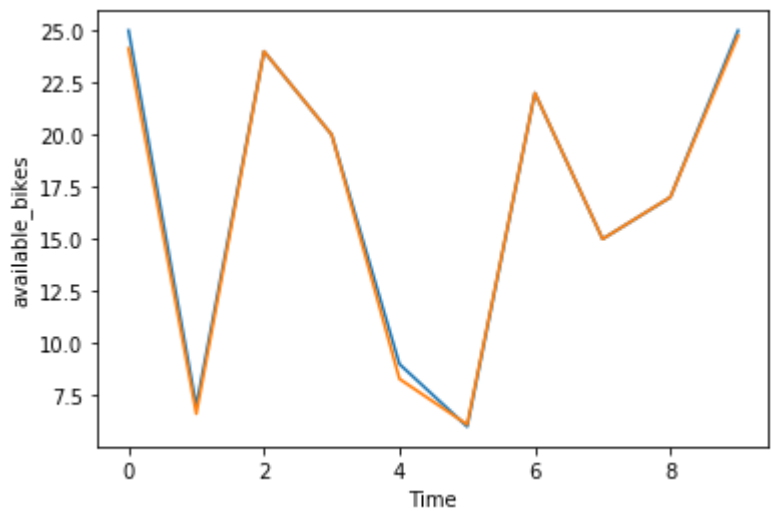
=====

=
Station 16 available_bike_stands
MAE: 0.5767699642431466
MSE: 1.0917009535160904
RMSE: 1.0448449423316795
R2: 0.9676435374672392



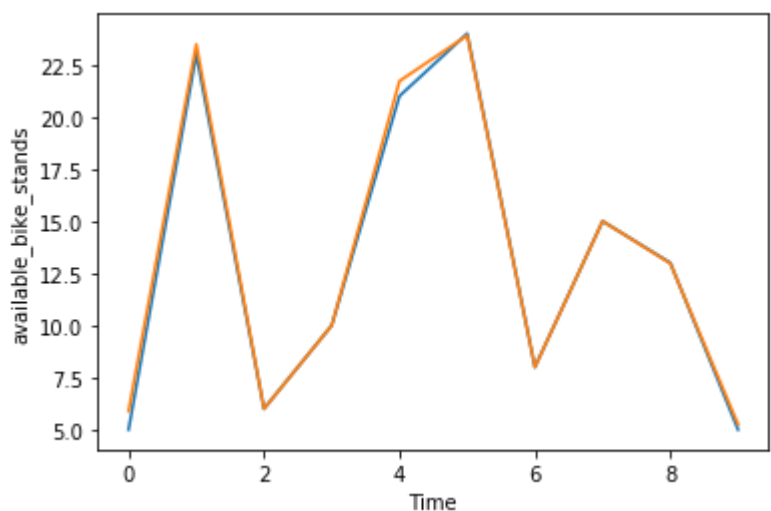
=====

=
Station 96 available_bikes
MAE: 0.29349225268176404
MSE: 0.39201978545887955
RMSE: 0.6261148340830774
R2: 0.9952947243565501

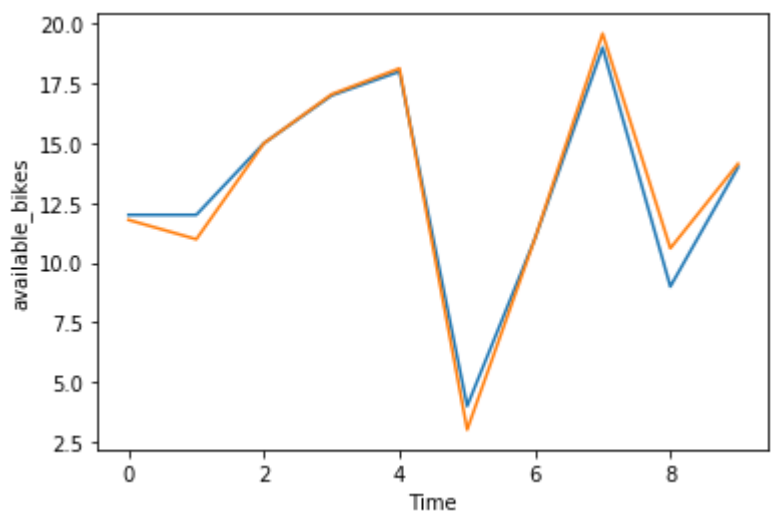


=====

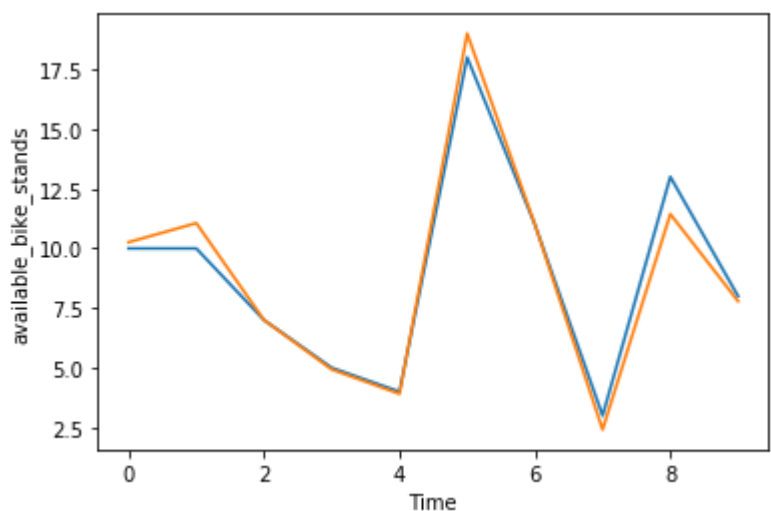
=
Station 96 available_bike_stands
MAE: 0.29342073897497023
MSE: 0.39398545887961856
RMSE: 0.6276826099866226
R2: 0.9952715430661228



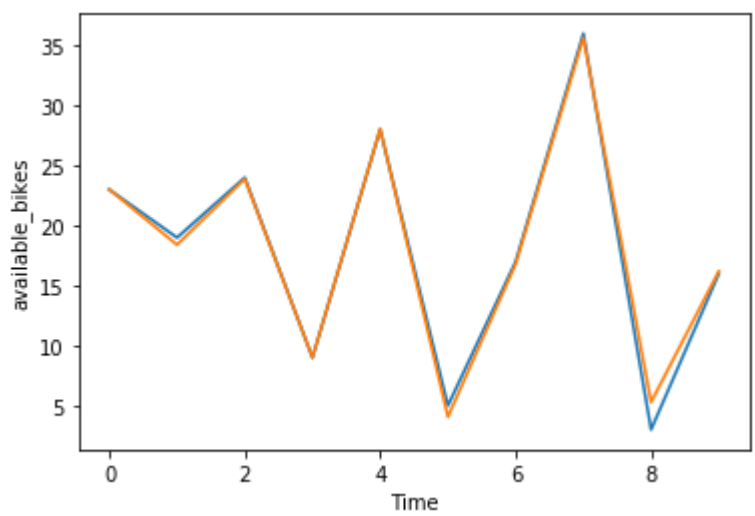
```
=====
=
Station 82      available_bikes
MAE:  0.3847199046483909
MSE:  0.4903320619785459
RMSE:  0.7002371469570476
R2:   0.9879246367193163
```



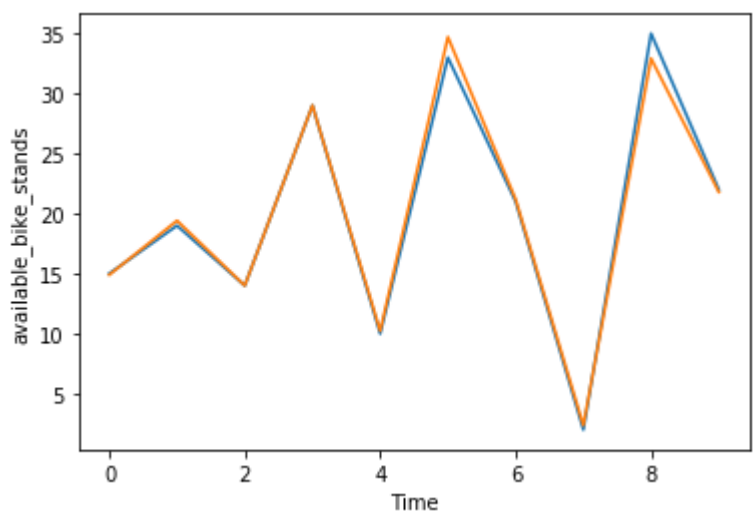
```
=====
=
Station 82      available_bike_stands
MAE:  0.3898569725864123
MSE:  0.4943932061978546
RMSE:  0.7031310021595226
R2:   0.9878641623809906
```



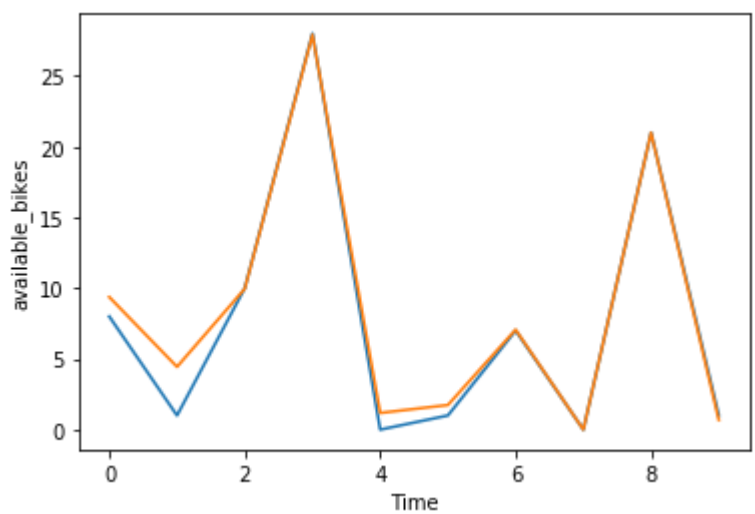
```
=====
=
Station 76      available_bikes
MAE:  0.7174374255065555
MSE:  2.1106988081048867
RMSE:  1.4528244243902588
R2:   0.9721074032473315
```



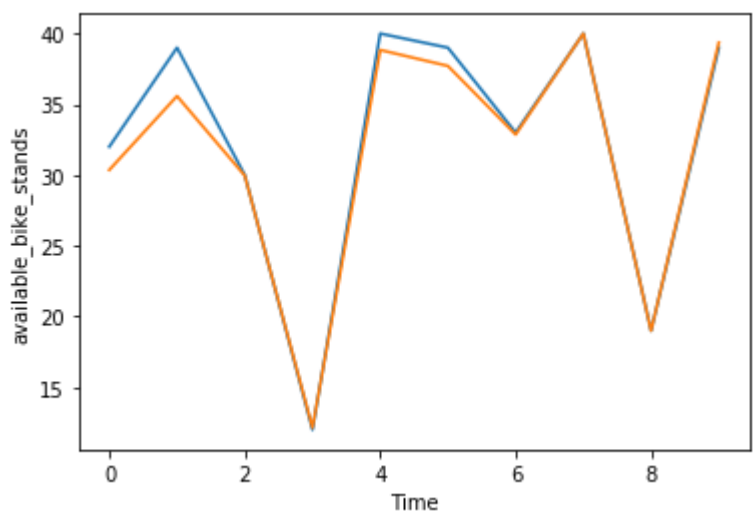
```
=====
=
Station 76      available_bike_stands
MAE:  0.7027294398092969
MSE:  1.9243245530393327
RMSE:  1.3872002570066562
R2:   0.9738037337284345
```



```
=====
=
Station 71      available_bikes
MAE:  0.7183194278903458
MSE:  1.382447556615018
RMSE:  1.1757753002232263
R2:   0.9793966765313299
```

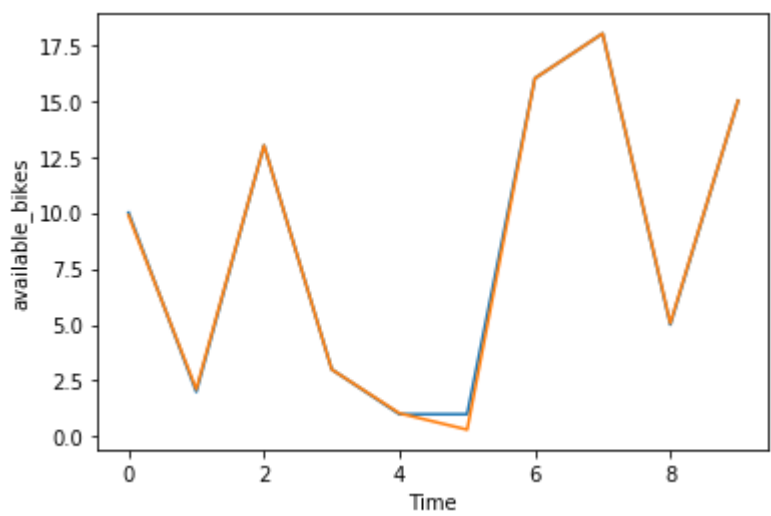


```
=====
=
Station 71      available_bike_stands
MAE:  0.7264243146603099
MSE:  1.4332637663885575
RMSE:  1.1971899458267086
R2:   0.9785737775607345
```

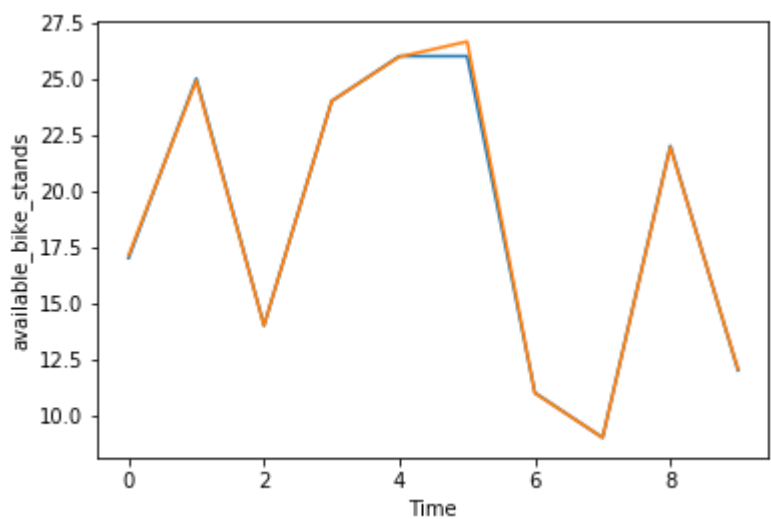
=====

=
Station 79 available_bikes
MAE: 0.6550655542312277
MSE: 2.3481218116805724
RMSE: 1.5323582517416
R2: 0.962236344206015

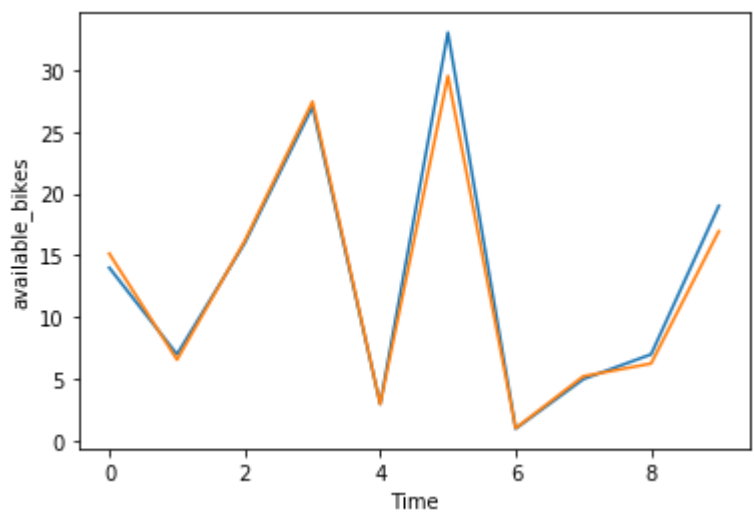


=====

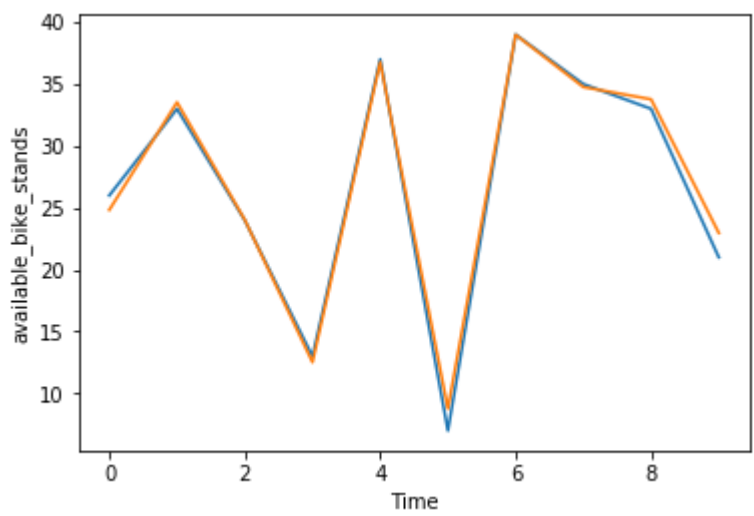
=
Station 79 available_bike_stands
MAE: 0.6530631704410013
MSE: 2.3637139451728246
RMSE: 1.5374374605728927
R2: 0.9620052142849999



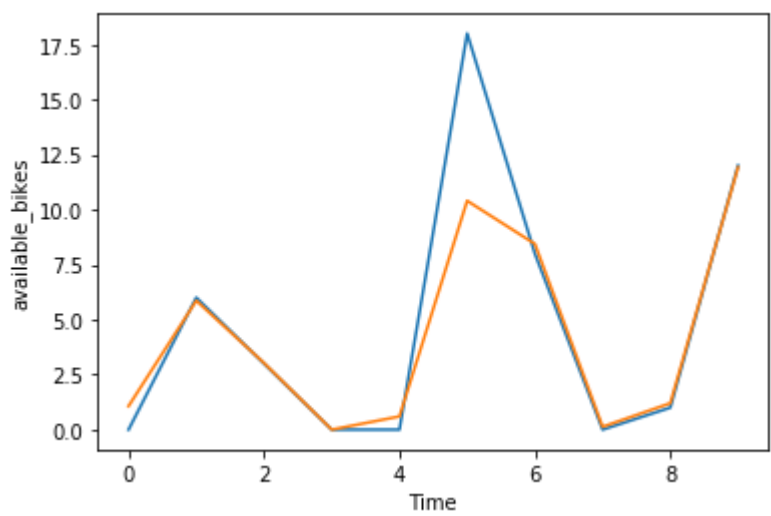
```
=====
=
Station 69      available_bikes
MAE:  1.533766388557807
MSE:  6.867226817640048
RMSE:  2.62053941348724
R2:   0.9482154082718737
```



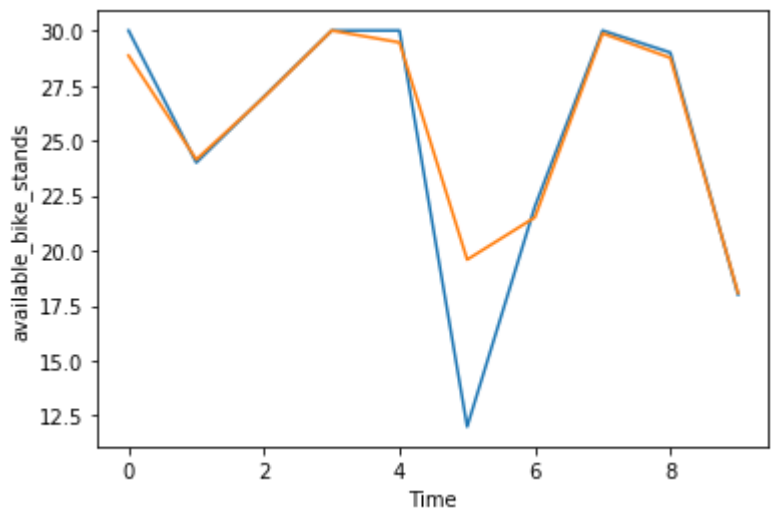
```
=====
=
Station 69      available_bike_stands
MAE:  1.5258045292014304
MSE:  6.863207032181168
RMSE:  2.6197723244933266
R2:   0.9491160458125371
```



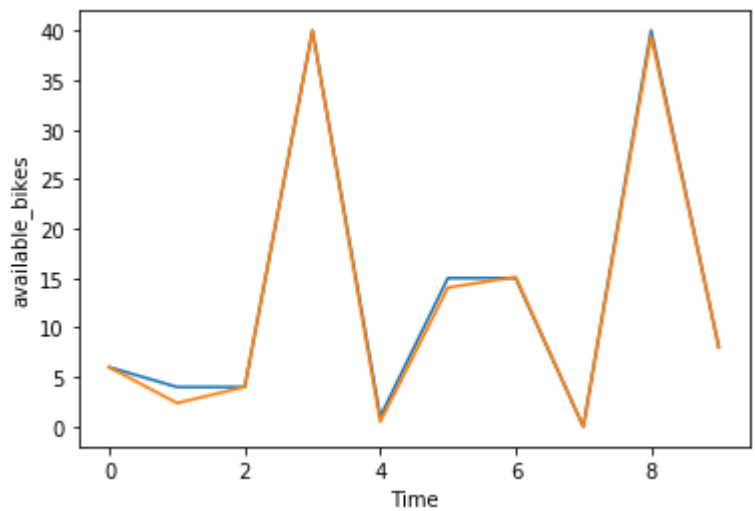
```
=====
=
Station 25      available_bikes
MAE:  0.6458879618593563
MSE:  1.6472390941597137
RMSE:  1.2834481267895925
R2:   0.9767790651268528
```



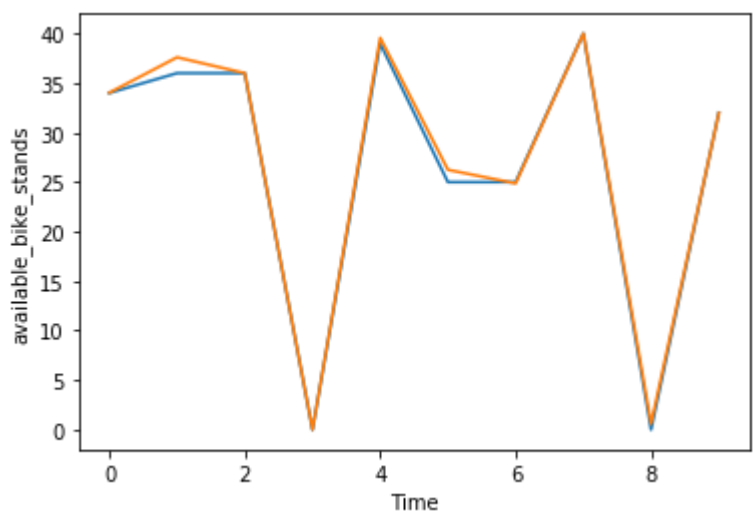
```
=====
=
Station 25      available_bike_stands
MAE:  0.6569129916567342
MSE:  1.6749648390941598
RMSE:  1.2942043266401793
R2:   0.9767612796129654
```



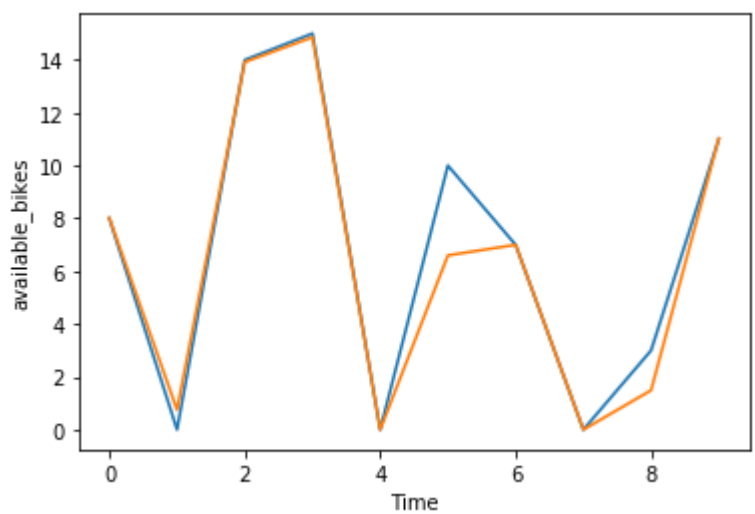
```
=====
=
Station 51      available_bikes
MAE:  0.7490584028605484
MSE:  2.9113432657926106
RMSE:  1.7062658836748188
R2:   0.971861047867049
```



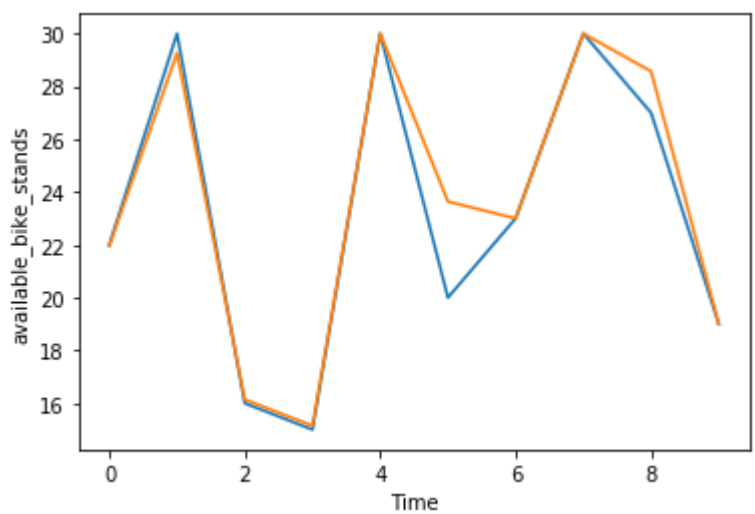
```
=====
=
Station 51      available_bike_stands
MAE:  0.7570441001191897
MSE:  3.0951425506555426
RMSE:  1.7593017224613698
R2:   0.9700787585834866
```



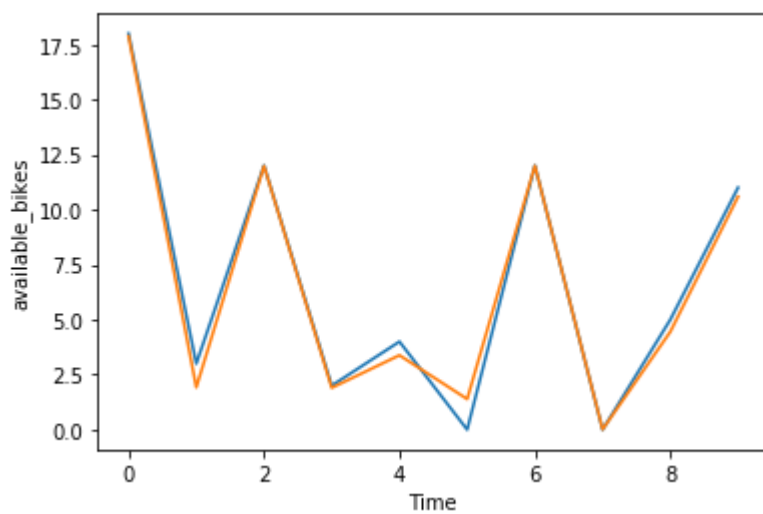
```
=====
=
Station 37      available_bikes
MAE:  0.5620619785458879
MSE:  1.5042494636471988
RMSE:  1.2264784807110147
R2:   0.9592197226985414
```



```
=====
=
Station 37      available_bike_stands
MAE:  0.5543384982121574
MSE:  1.4817998808104886
RMSE:  1.2172920277445707
R2:   0.959987047342156
```

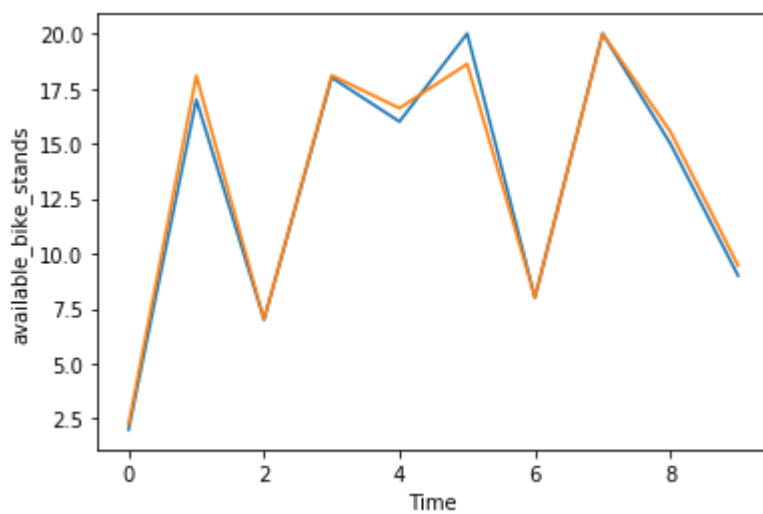


```
=====
=
Station 59      available_bikes
MAE:  0.5047437425506556
MSE:  0.9232898688915376
RMSE:  0.9608797369554307
R2:   0.96105451396217
```



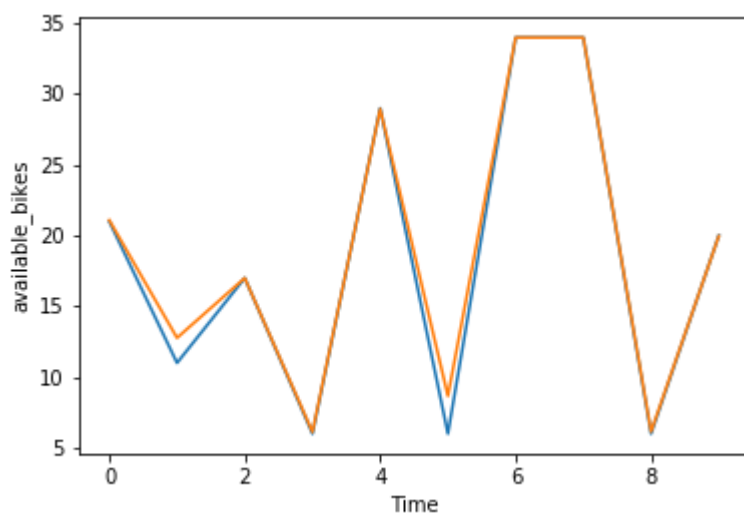
=====

=
Station 59 available_bike_stands
MAE: 0.5061263408820024
MSE: 0.9206502979737782
RMSE: 0.9595052360324972
R2: 0.9620796631888784

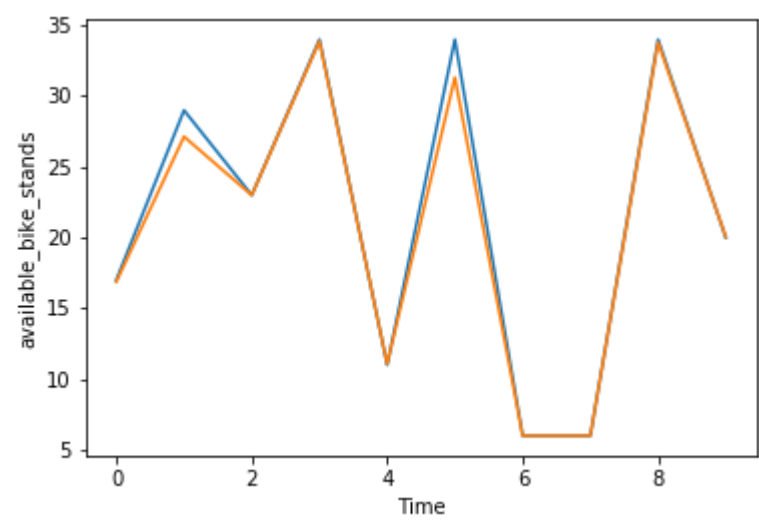


=====

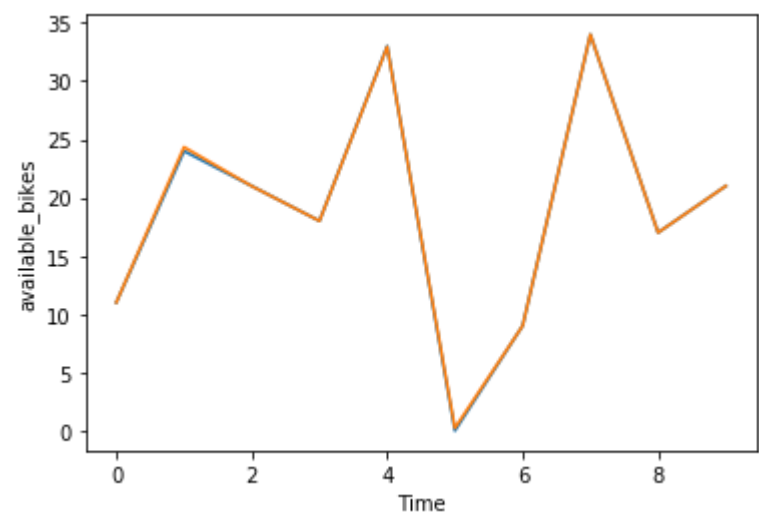
=
Station 95 available_bikes
MAE: 0.6706436233611441
MSE: 1.7289581644815253
RMSE: 1.3148985377136615
R2: 0.9820443925818678



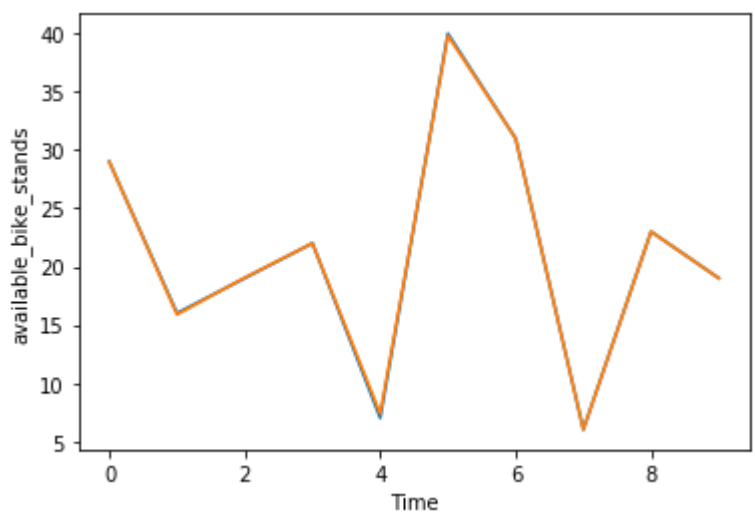
```
=====
=
Station 95      available_bike_stands
MAE:  0.674410011918951
MSE:  1.6910499404052444
RMSE:  1.300403760531799
R2:   0.9824733745557629
```



```
=====
=
Station 94      available_bikes
MAE:  0.40830750893921336
MSE:  1.9375984505363528
RMSE:  1.3919764547349043
R2:   0.9881929940152117
```

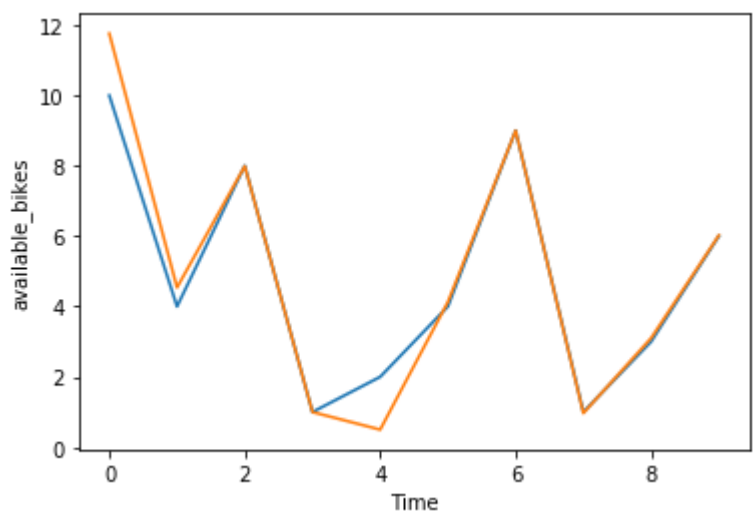


```
=====
=
Station 94      available_bike_stands
MAE:  0.41276519666269373
MSE:  1.9389140643623362
RMSE:  1.392448944975124
R2:   0.9882104637915683
```



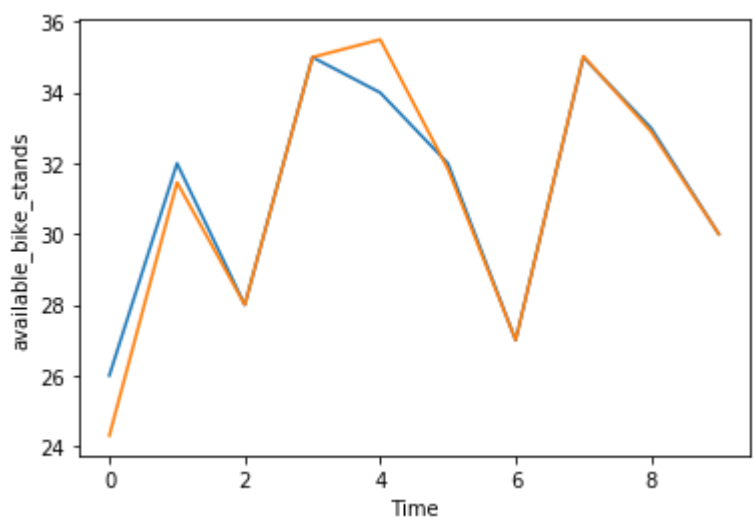
=====

=
Station 105 available_bikes
MAE: 0.37165673420738965
MSE: 0.7970569725864125
RMSE: 0.8927804727851144
R2: 0.9837432652864669



=====

=
Station 105 available_bike_stands
MAE: 0.37591179976162103
MSE: 0.8046673420738973
RMSE: 0.8970325200759989
R2: 0.9836778455942172



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=

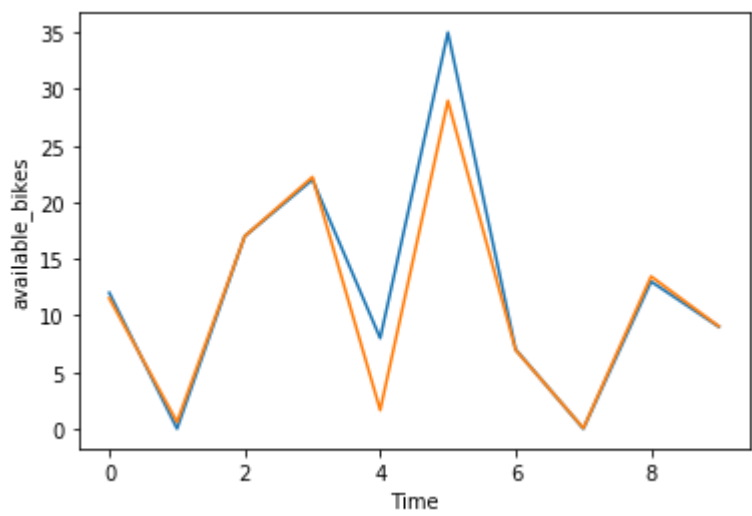
Station 36 available_bikes

MAE: 0.6943384982121573

MSE: 1.6811233611442193

RMSE: 1.2965814132341322

R2: 0.9832896347312395



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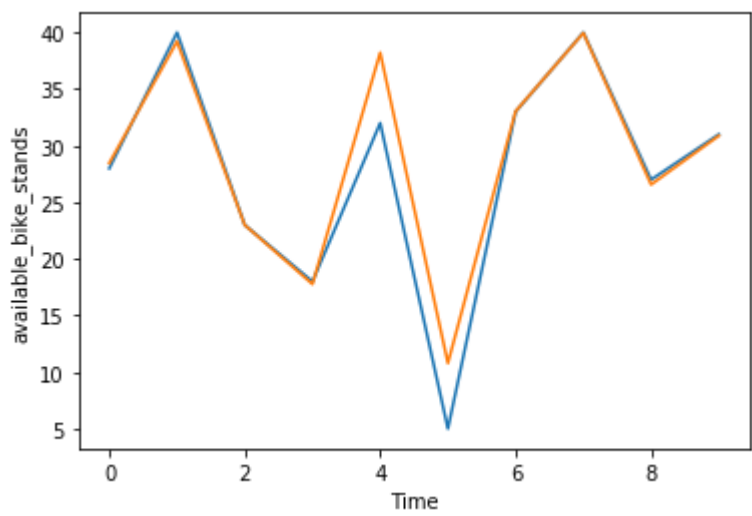
Station 36 available_bike_stands

MAE: 0.7044576877234803

MSE: 1.7684526817640047

RMSE: 1.3298318246169343

R2: 0.9828225237801297



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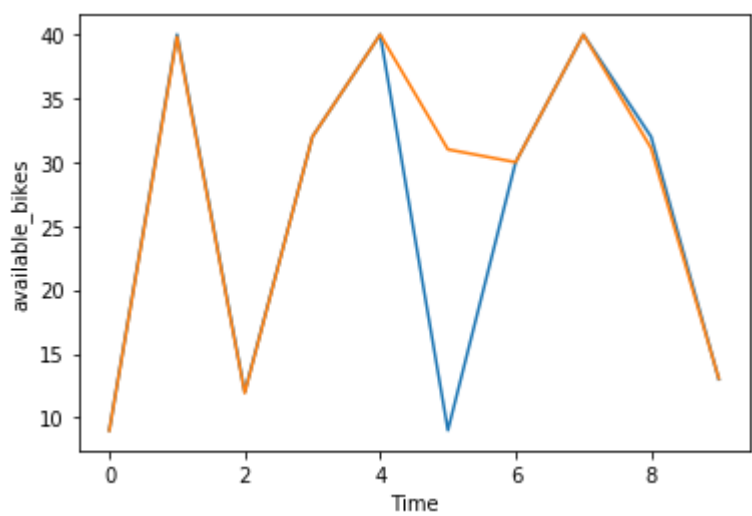
Station 93 available_bikes

MAE: 0.7094755661501788

MSE: 4.703919547079857

RMSE: 2.1688521266051906

R2: 0.9749684265394989



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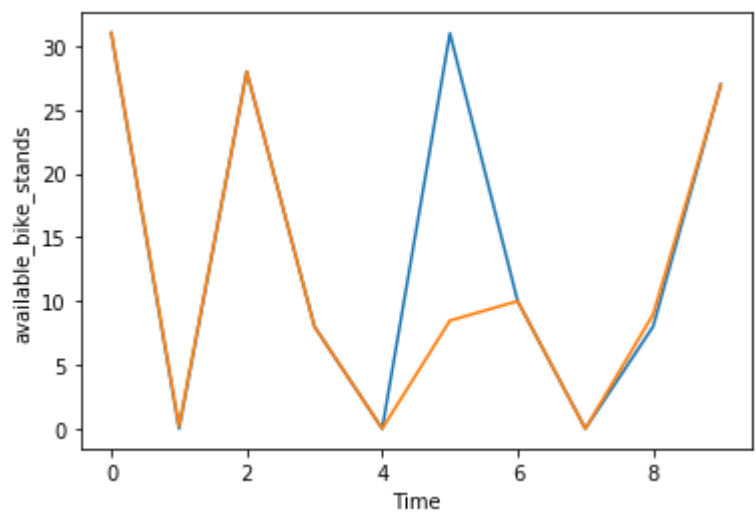
Station 93 available_bike_stands

MAE: 0.7165435041716329

MSE: 4.798898450536353

RMSE: 2.1906388224753877

R2: 0.9744711734889133



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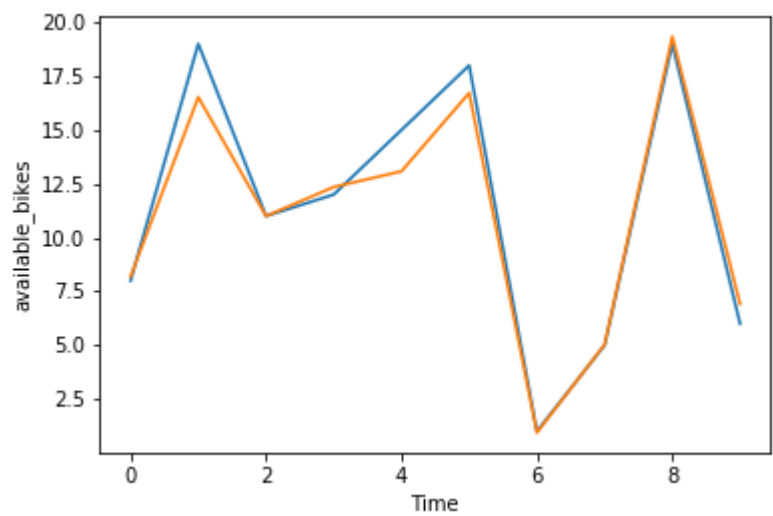
Station 22 available_bikes

MAE: 0.825876042908224

MSE: 2.1266849821215734

RMSE: 1.4583158032887025

R2: 0.9193748096525436



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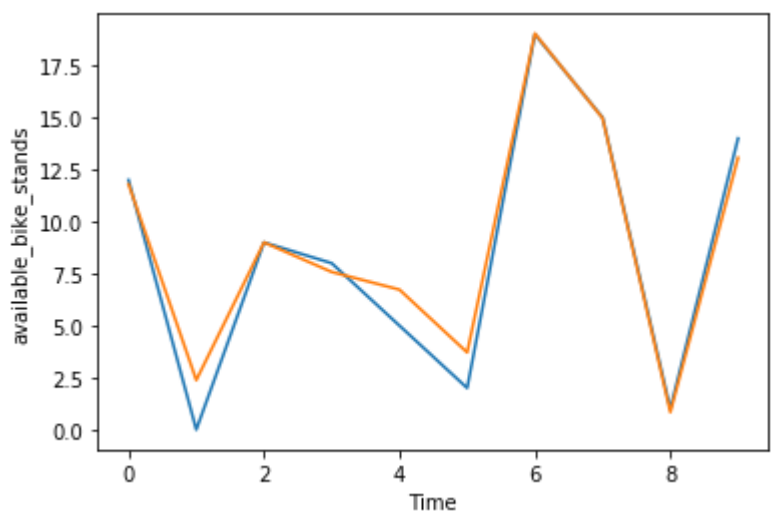
Station 22 available_bike_stands

MAE: 0.8201668653158523

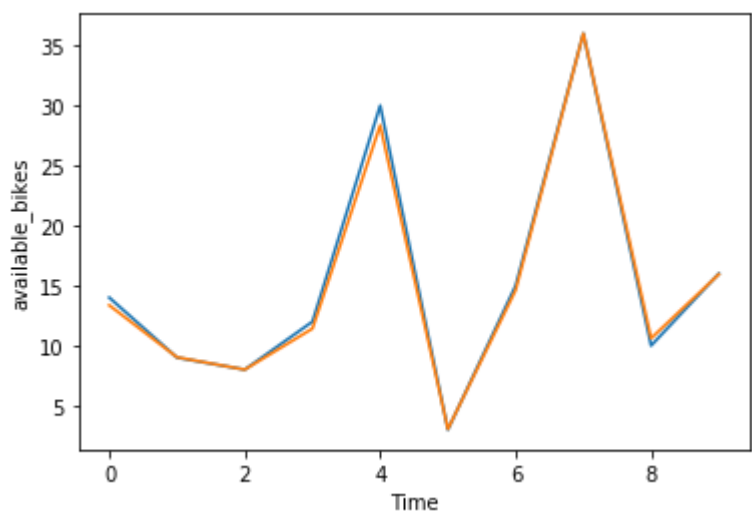
MSE: 2.1098710369487486

RMSE: 1.4525395130421577

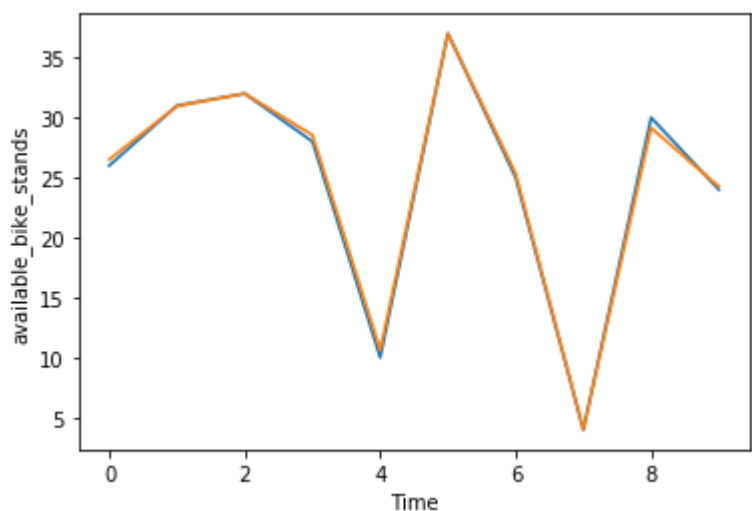
R2: 0.9206327411535621



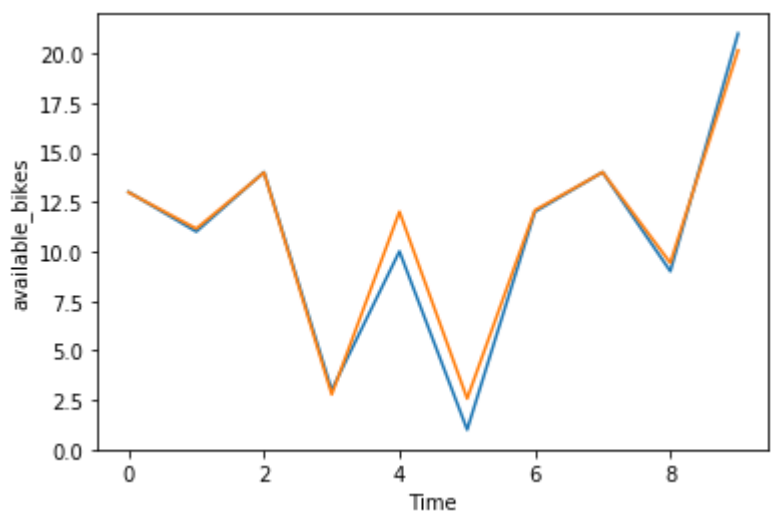
```
=====
=
Station 50      available_bikes
MAE:  0.7996901072705601
MSE:  1.6284636471990463
RMSE:  1.2761127094418605
R2:   0.9803388447846395
```



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=====
=
Station 50      available_bike_stands
MAE:  0.797175208581645
MSE:  1.6647526817640053
RMSE:  1.290252952627509
R2:   0.9799480203755484
```

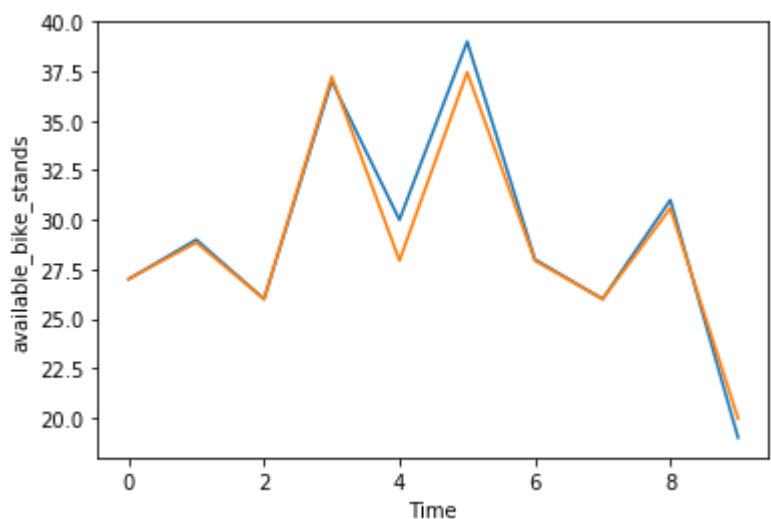


```
=====
=
Station 110     available_bikes
MAE:  0.5994517282479143
MSE:  1.390541358760429
RMSE:  1.1792121771591526
R2:   0.9710471388932173
```



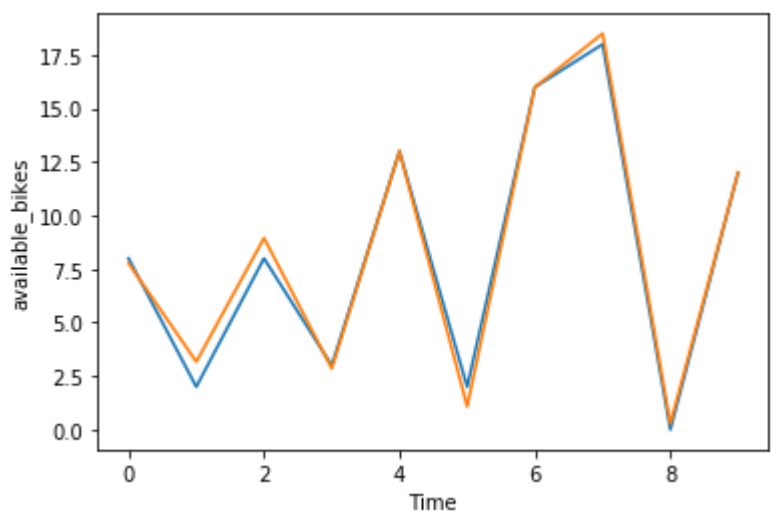
=====

=
Station 110 available_bike_stands
MAE: 0.594803337306317
MSE: 1.3639578069129916
RMSE: 1.1678860419206112
R2: 0.9716972384219149



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=
Station 12 available_bikes
MAE: 0.5566388557806913
MSE: 0.9041134684147795
RMSE: 0.9508488146991505
R2: 0.973851532835403



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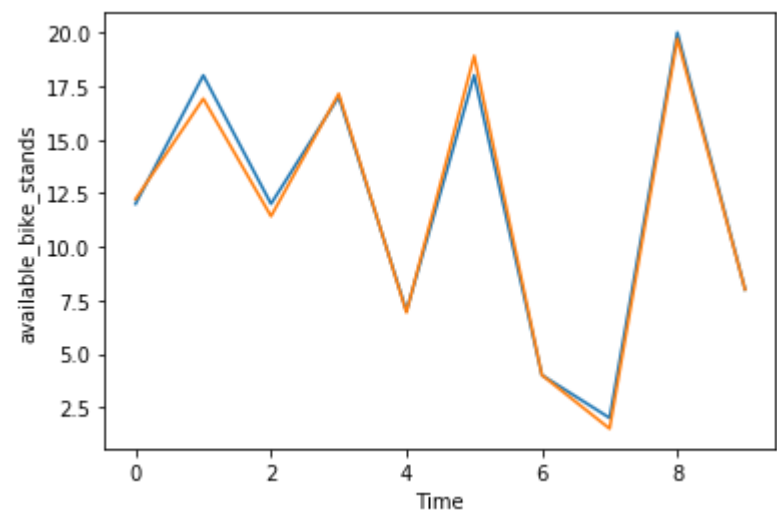
Station 12 available_bike_stands

MAE: 0.5621692491060787

MSE: 0.929754231227652

RMSE: 0.9642376425071011

R2: 0.9734313369697135



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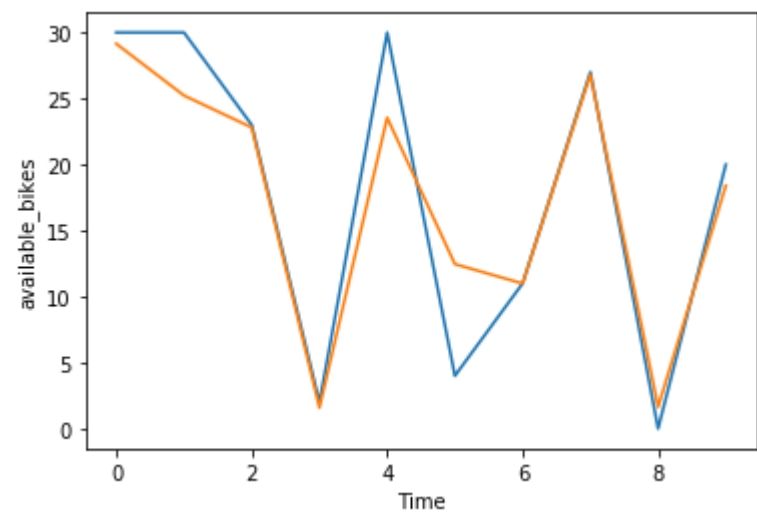
Station 34 available_bikes

MAE: 1.3888676996424314

MSE: 5.606354231227652

RMSE: 2.367774108995124

R2: 0.9389758909189794



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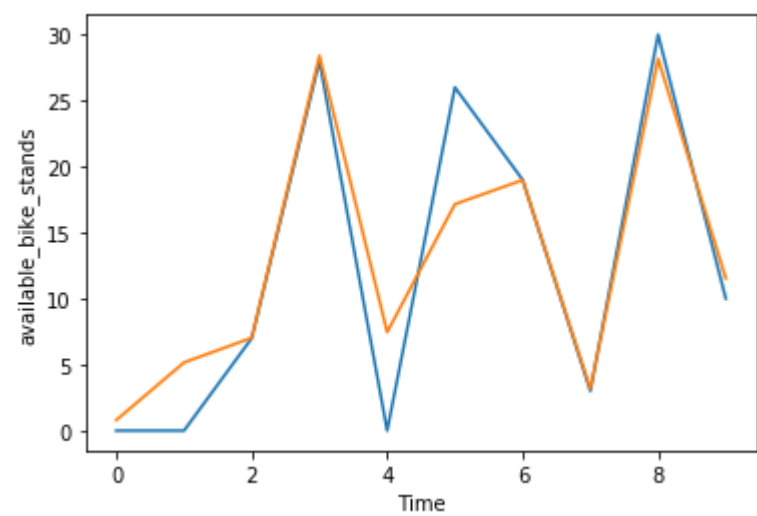
Station 34 available_bike_stands

MAE: 1.3982240762812874

MSE: 5.6811660309892735

RMSE: 2.383519672876495

R2: 0.9382110383956018



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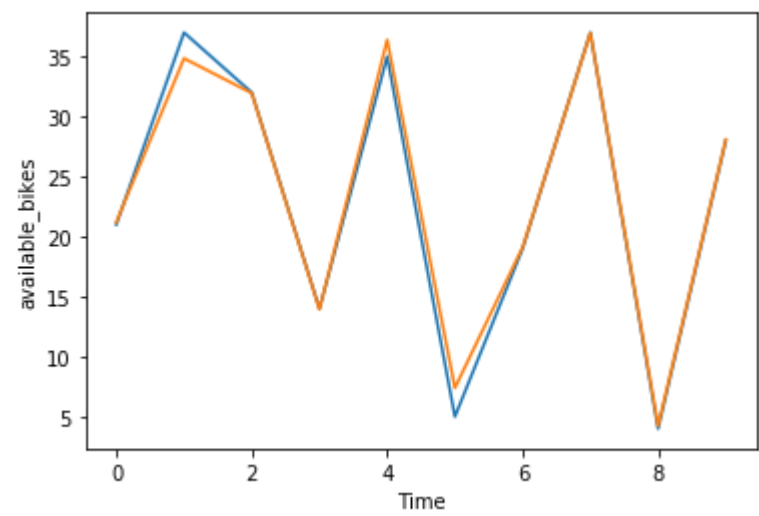
Station 78 available_bikes

MAE: 0.8149821215733015

MSE: 2.3002017878426697

RMSE: 1.5166416148328088

R2: 0.9810315373094854



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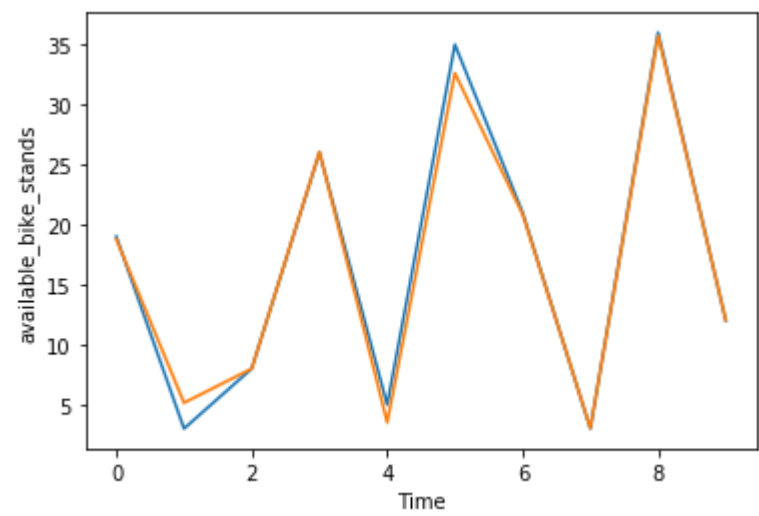
Station 78 available_bike_stands

MAE: 0.8215017878426698

MSE: 2.30116305125149

RMSE: 1.516958486990165

R2: 0.98106344156081



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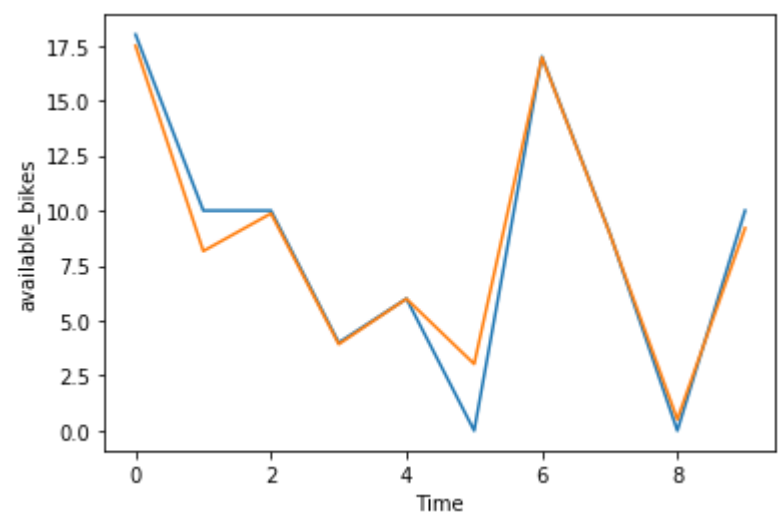
Station 2 available_bikes

MAE: 0.5568533969010726

MSE: 1.066833611442193

RMSE: 1.0328763776184413

R2: 0.9624784312528305



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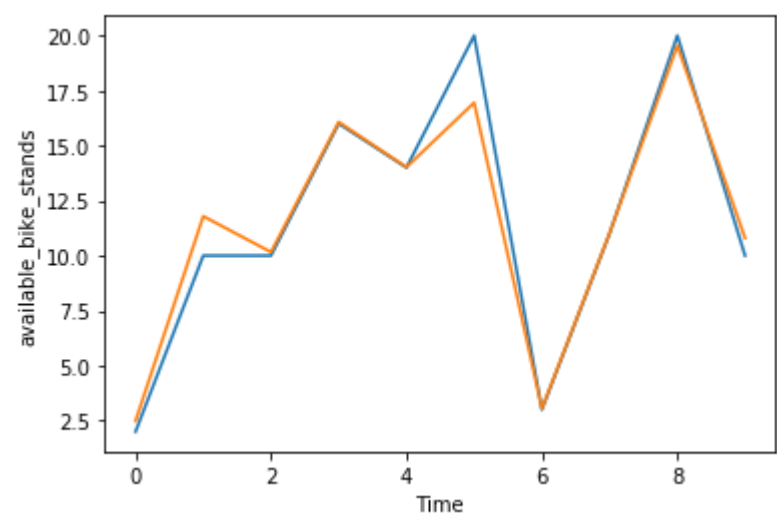
Station 2 available_bike_stands

MAE: 0.5546960667461264

MSE: 1.059149106078665

RMSE: 1.0291497005191543

R2: 0.9627487027302128



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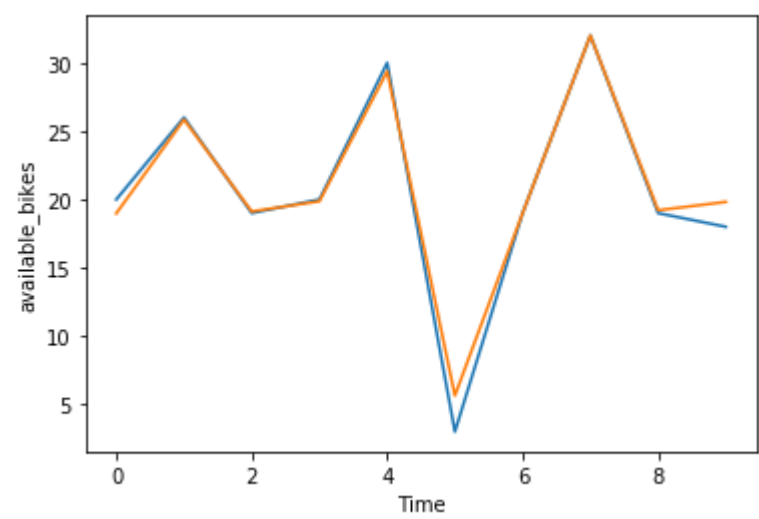
Station 75 available_bikes

MAE: 0.7855899880810491

MSE: 2.7625076281287244

RMSE: 1.6620793086157846

R2: 0.9680003718323474



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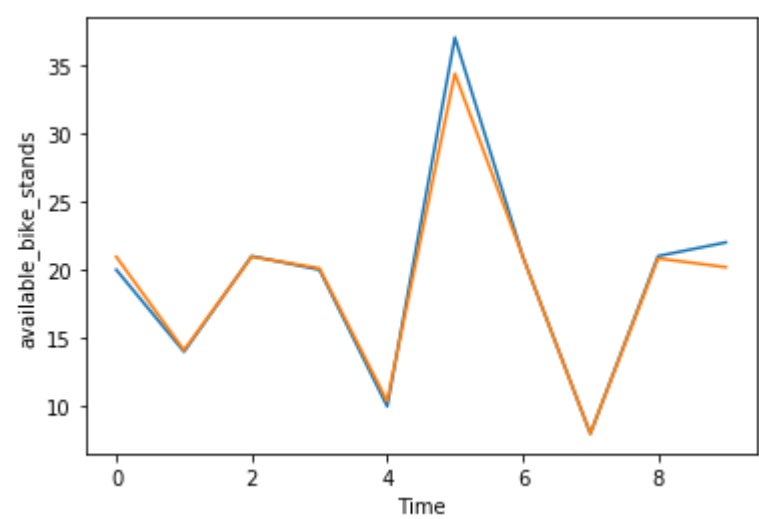
Station 75 available_bike_stands

MAE: 0.7885458879618592

MSE: 2.7943107270560192

RMSE: 1.6716191931944366

R2: 0.9676138934759294



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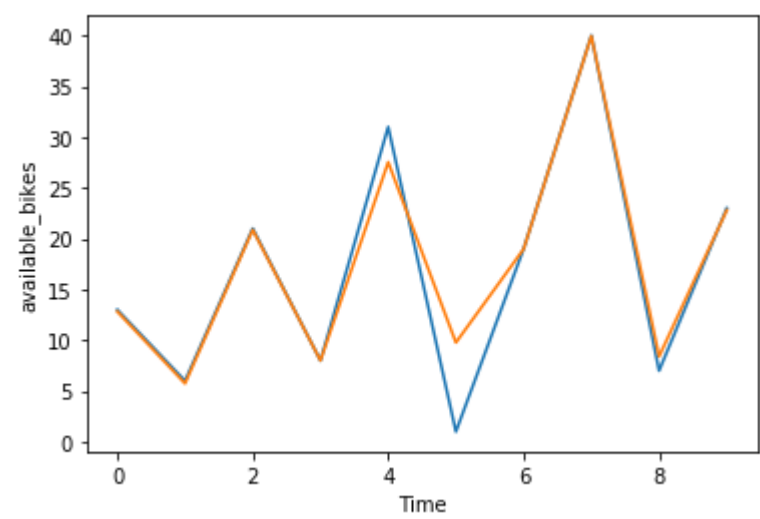
Station 111 available_bikes

MAE: 0.9351609058402862

MSE: 2.8142019070321815

RMSE: 1.6775583170287052

R2: 0.9749335050200413



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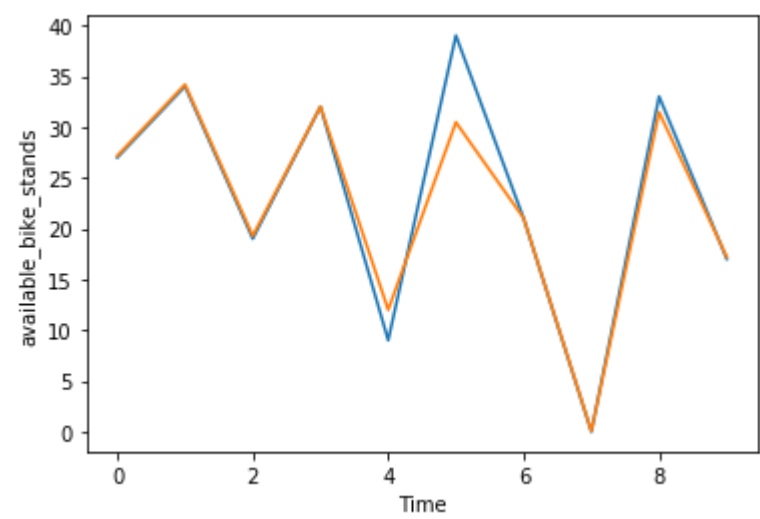
Station 111 available_bike_stands

MAE: 0.9304290822407629

MSE: 2.7470666269368302

RMSE: 1.6574277139401374

R2: 0.9756011320114553



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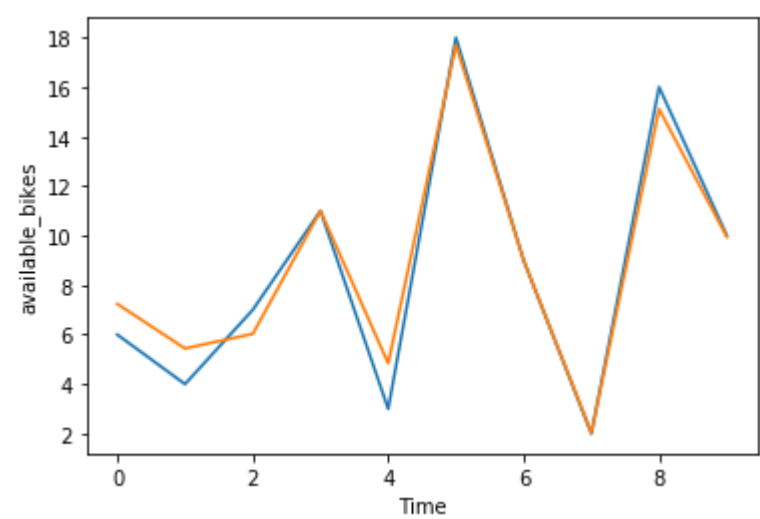
Station 26 available_bikes

MAE: 0.5750893921334923

MSE: 1.042313945172825

RMSE: 1.0209377773267208

R2: 0.9714772853417983



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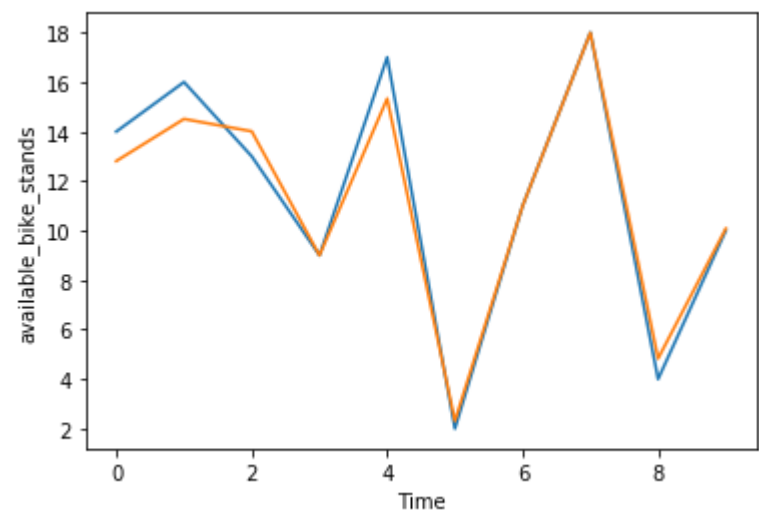
Station 26 available_bike_stands

MAE: 0.5827771156138261

MSE: 1.0814189511323005

RMSE: 1.0399129536323222

R2: 0.9710040237764157



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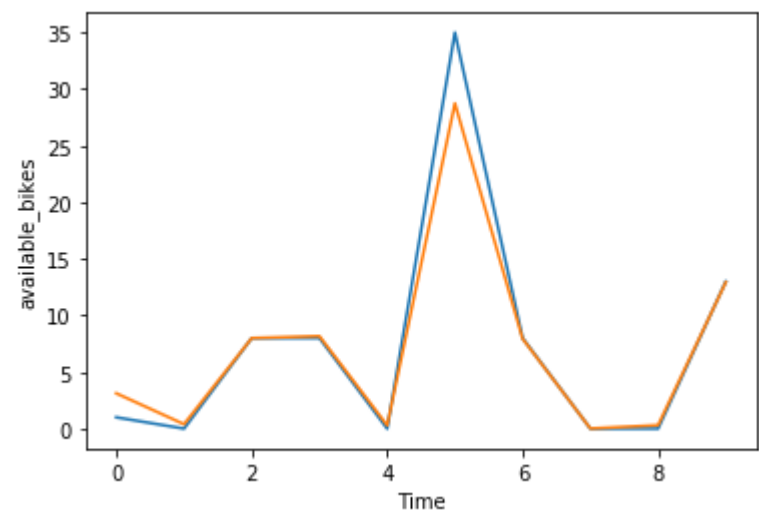
Station 65 available_bikes

MAE: 0.849642431466031

MSE: 3.0994339690107275

RMSE: 1.7605209368282808

R2: 0.9703246330528131



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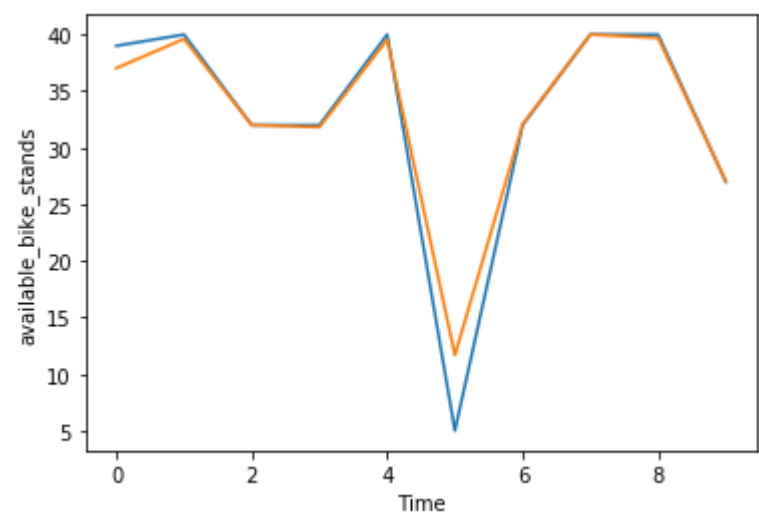
Station 65 available_bike_stands

MAE: 0.8708820023837903

MSE: 3.257711442193087

RMSE: 1.8049131397917981

R2: 0.9695247330743019



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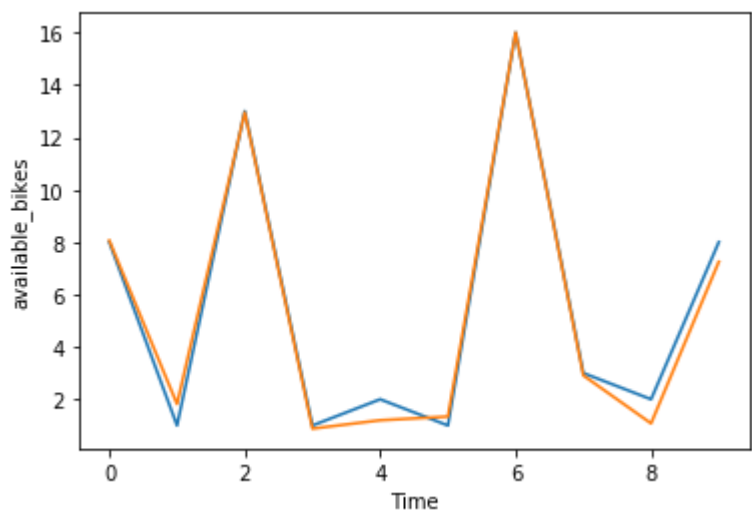
Station 15 available_bikes

MAE: 0.4513825983313468

MSE: 0.6296487485101311

RMSE: 0.7935040948288364

R2: 0.9609767134358346



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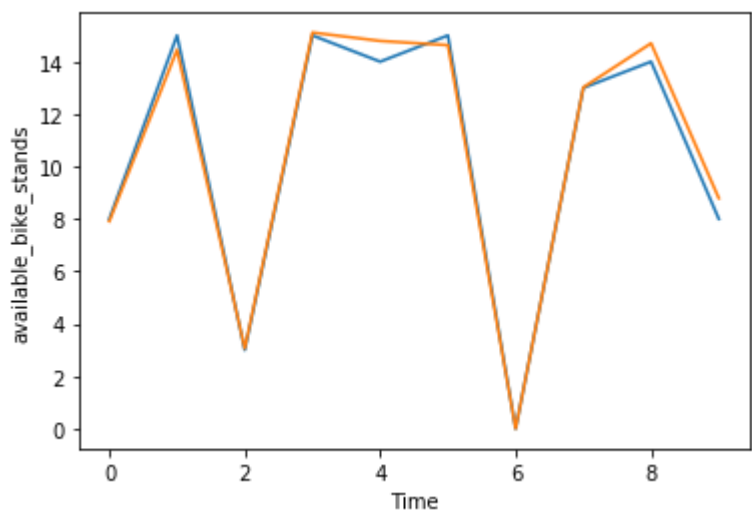
Station 15 available_bike_stands

MAE: 0.47537544696066736

MSE: 0.683543504171633

RMSE: 0.8267668983284424

R2: 0.9580555439033643



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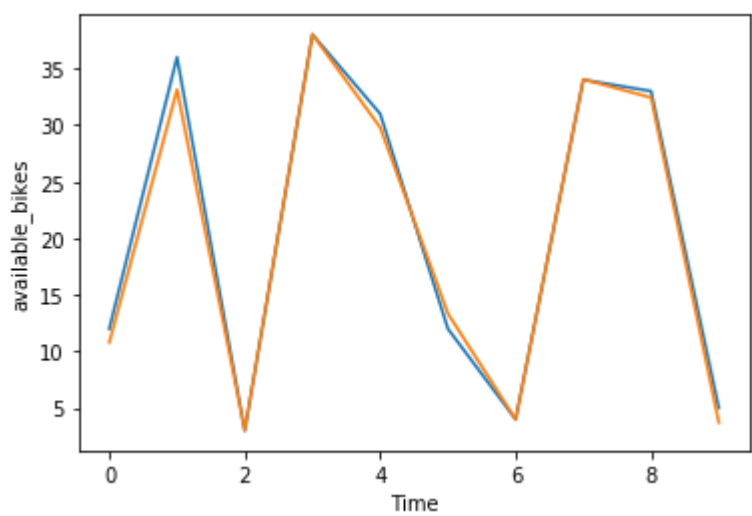
Station 86 available_bikes

MAE: 0.8472943980929678

MSE: 2.2466171632896303

RMSE: 1.4988719636078427

R2: 0.9865883348693507



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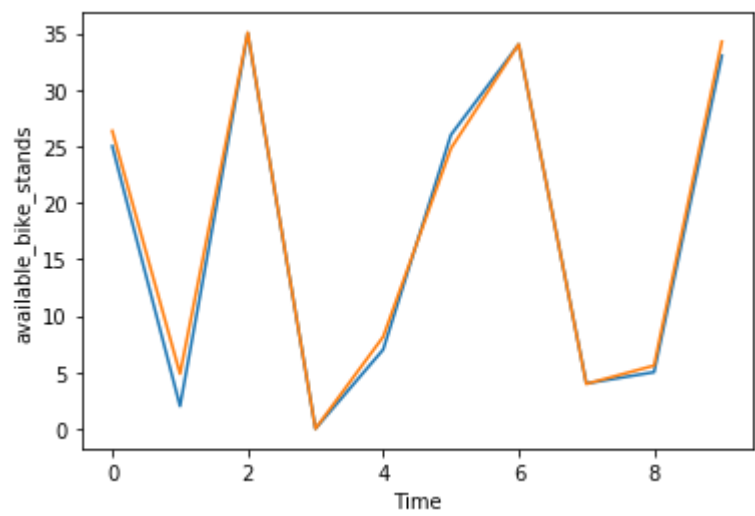
Station 86 available_bike_stands

MAE: 0.853611442193087

MSE: 2.245320381406436

RMSE: 1.4984393152231545

R2: 0.9865566434667642



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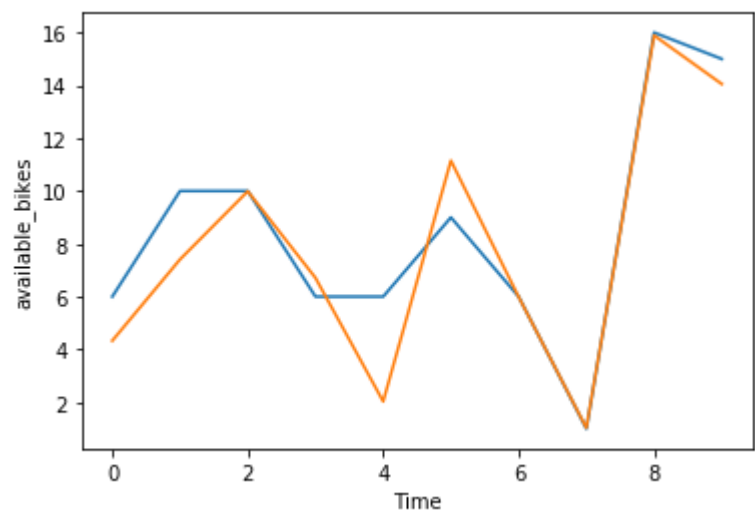
Station 10 available_bikes

MAE: 0.8716090584028605

MSE: 1.8898364719904648

RMSE: 1.3747132326381617

R2: 0.9343468010998071



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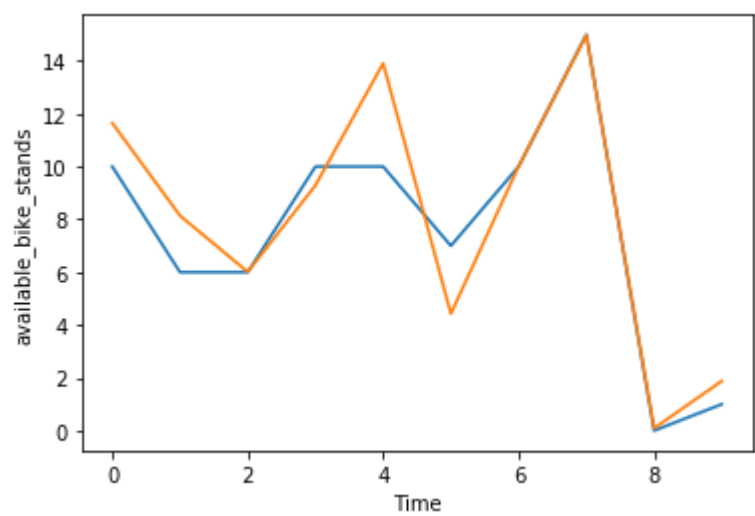
Station 10 available_bike_stands

MAE: 0.8707508939213349

MSE: 1.9054386174016686

RMSE: 1.3803762593588997

R2: 0.9343558647645269



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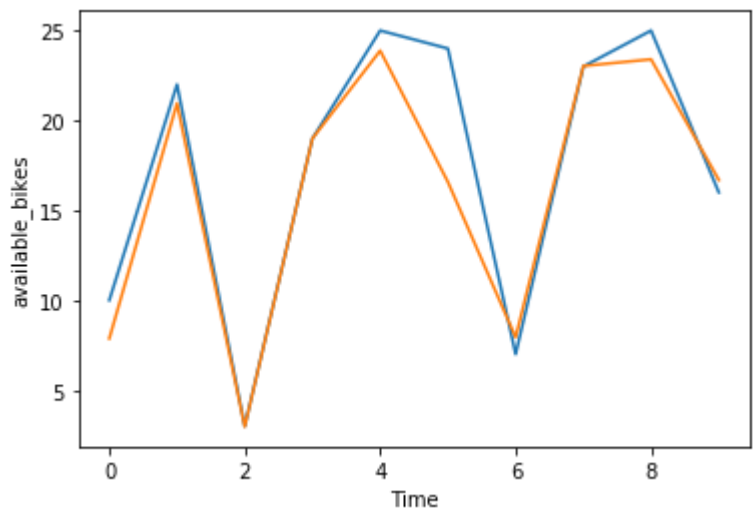
Station 100 available_bikes

MAE: 1.1028486293206197

MSE: 4.860778665077473

RMSE: 2.204717366257515

R2: 0.9233040849737518



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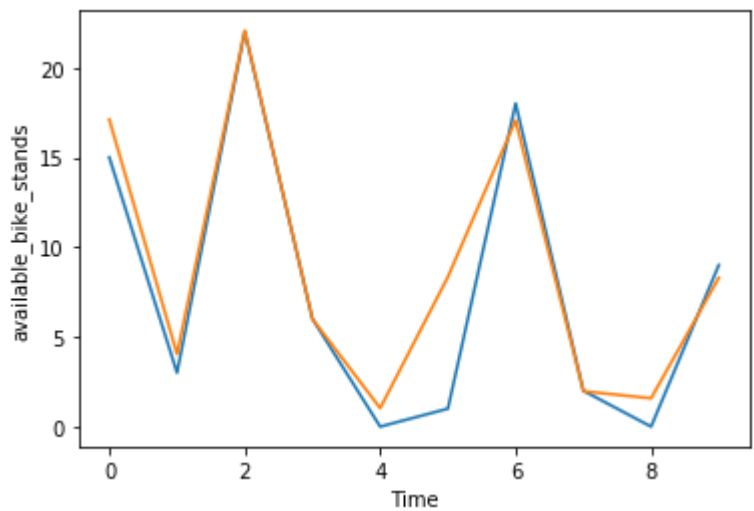
Station 100 available_bike_stands

MAE: 1.1062812872467223

MSE: 4.8811405244338495

RMSE: 2.20933033339324

R2: 0.9229308618204995



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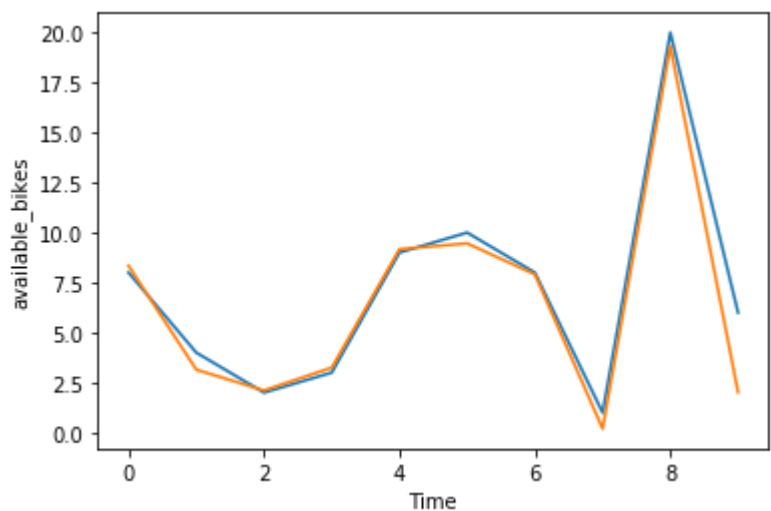
Station 24 available_bikes

MAE: 0.8140166865315852

MSE: 1.6913706793802146

RMSE: 1.300527077526729

R2: 0.9565628058019321



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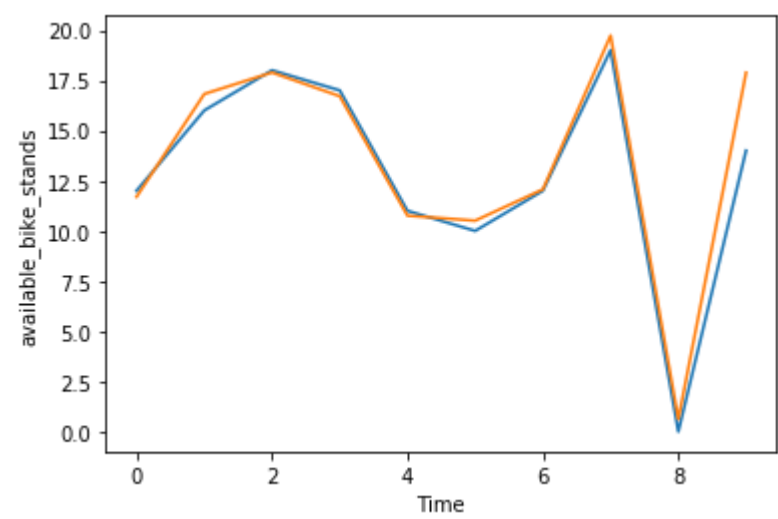
Station 24 available_bike_stands

MAE: 0.8027890345649582

MSE: 1.6664882002383794

RMSE: 1.290925327134912

R2: 0.9571338361370421



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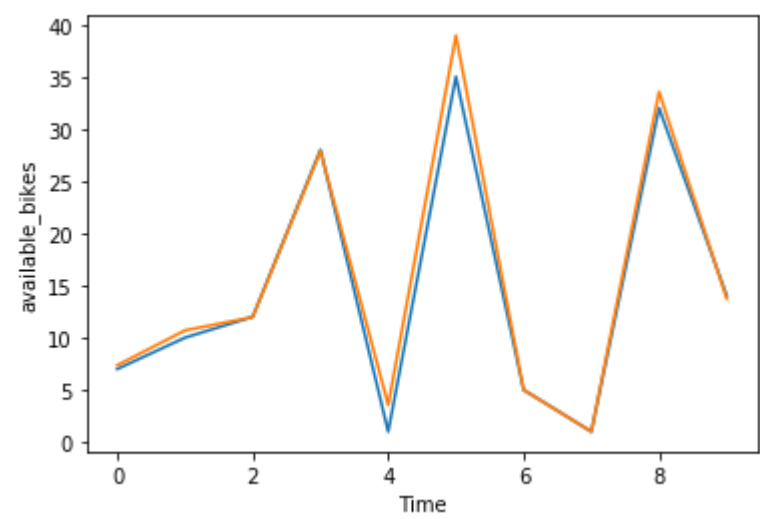
Station 64 available_bikes

MAE: 1.0190226460071514

MSE: 3.89987651966627

RMSE: 1.9748105022169267

R2: 0.9613567911262335



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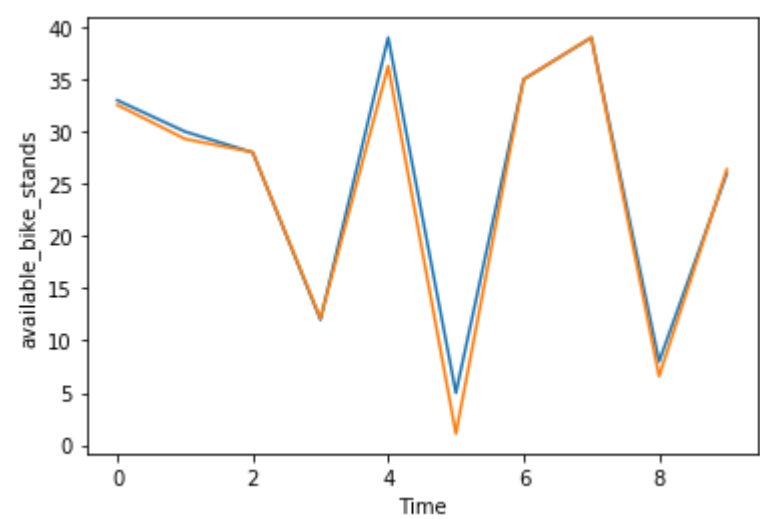
Station 64 available_bike_stands

MAE: 1.017854588796186

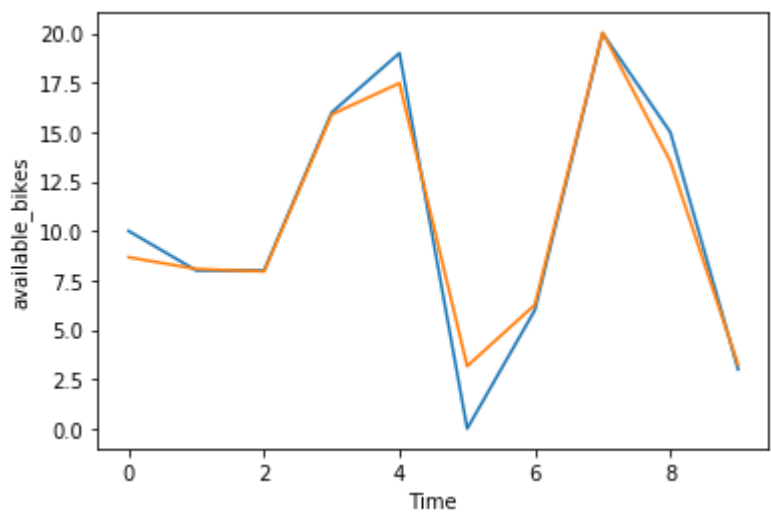
MSE: 3.9420994040524437

RMSE: 1.9854720859413872

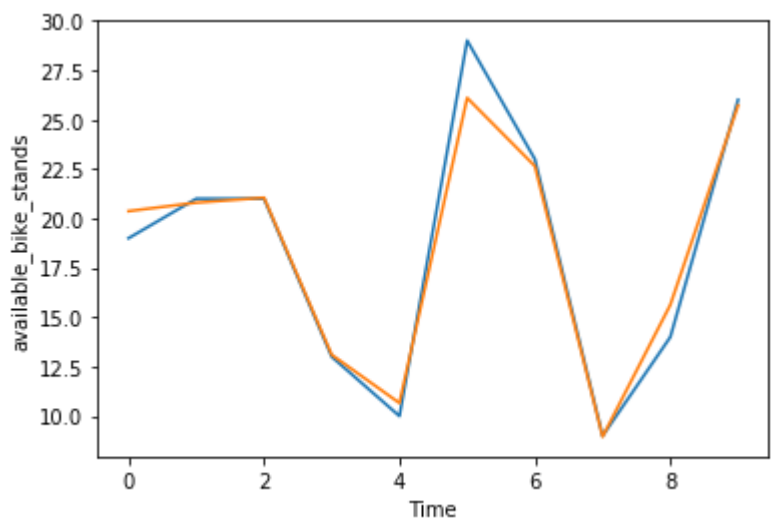
R2: 0.9612032582715584



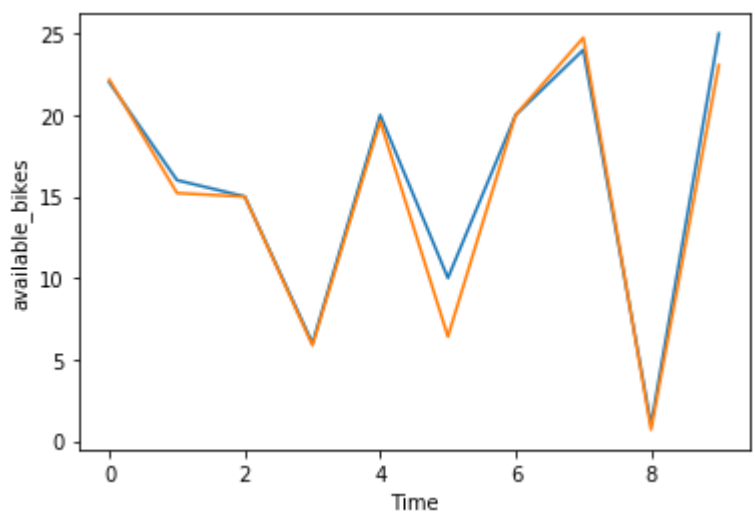
```
=====
=
Station 109      available_bikes
MAE:  0.6430750893921334
MSE:  1.3765444576877233
RMSE:  1.1732623141001859
R2:   0.9782351131684613
```



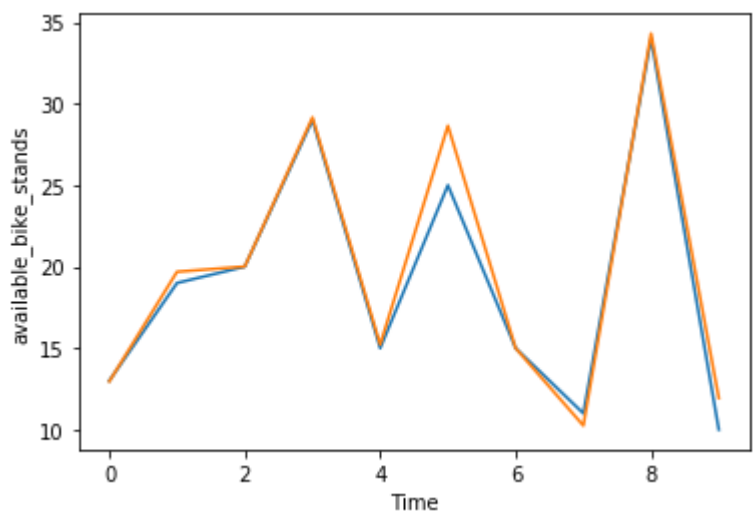
```
=====
=
Station 109      available_bike_stands
MAE:  0.6490941597139451
MSE:  1.366848033373063
RMSE:  1.1691227623192797
R2:   0.978421954880173
```



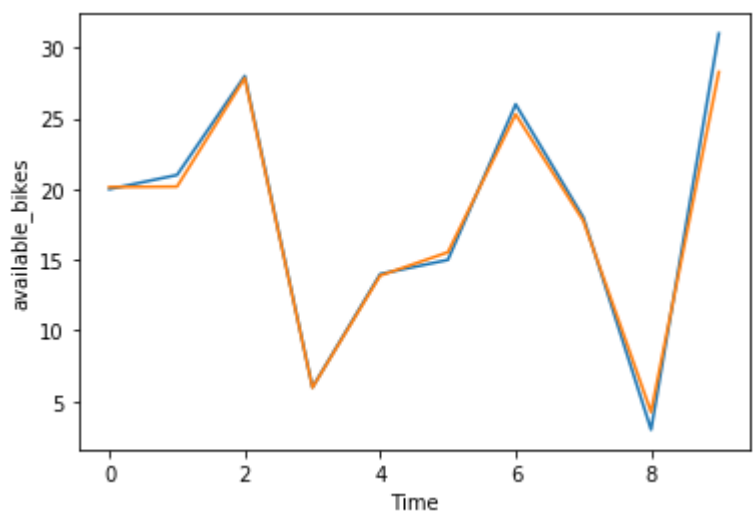
```
=====
=
Station 85       available_bikes
MAE:  0.6441597139451729
MSE:  1.50511620977354
RMSE:  1.2268317772920376
R2:   0.9832014760187093
```



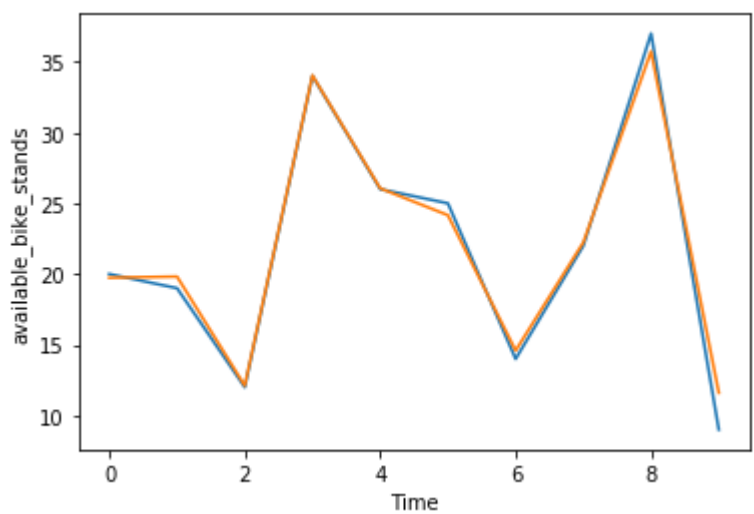
```
=====
=
Station 85      available_bike_stands
MAE:  0.6379499404052443
MSE:  1.4868548271752084
RMSE:  1.219366568007836
R2:   0.9834152270271301
```



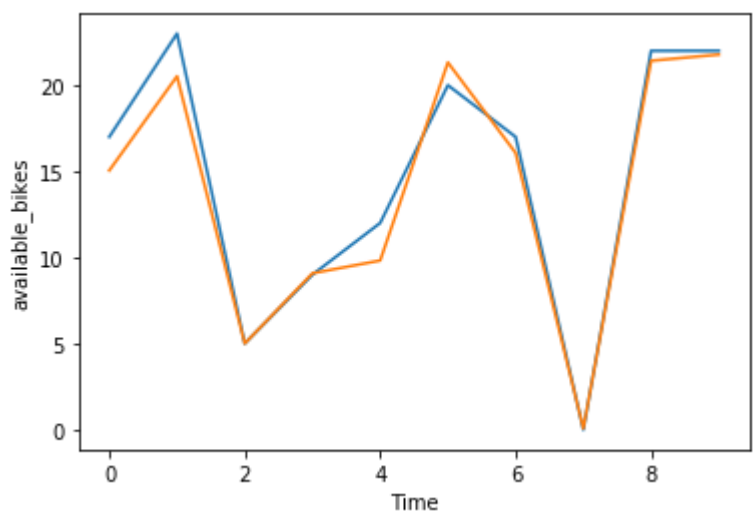
```
=====
=
Station 107     available_bikes
MAE:  0.7222407628128725
MSE:  2.1905845053635282
RMSE:  1.4800623315805075
R2:   0.9737814930478889
```



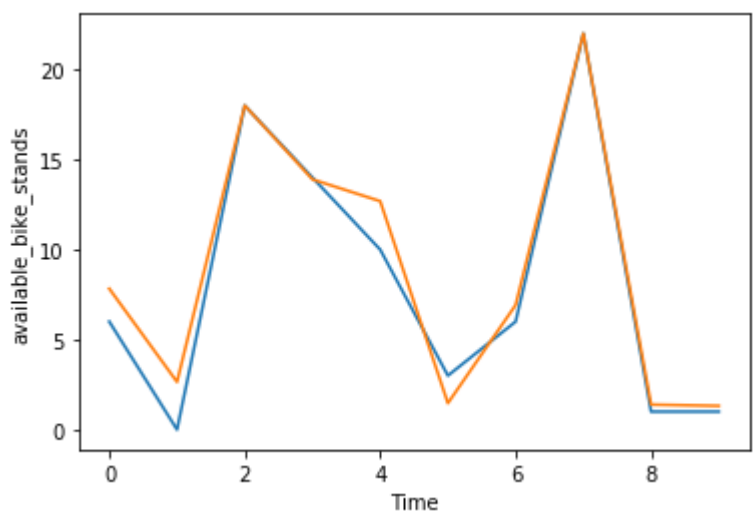
```
=====
=
Station 107     available_bike_stands
MAE:  0.7305005959475566
MSE:  2.2143820023837897
RMSE:  1.488079971770264
R2:   0.9734824520859592
```



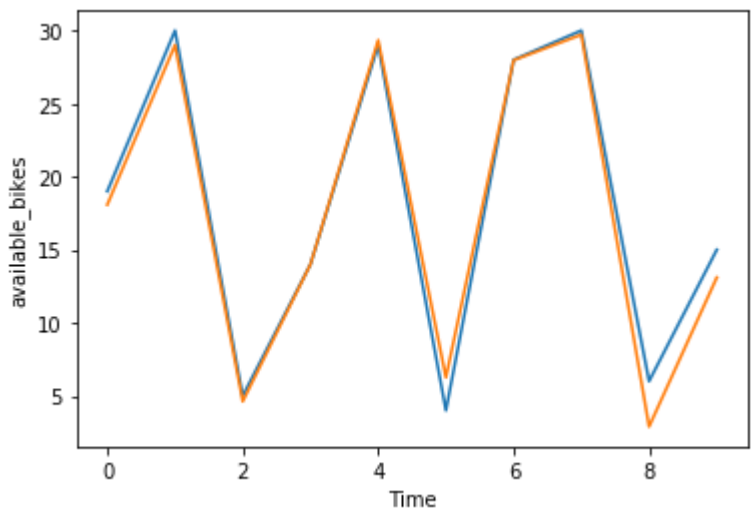
```
=====
=
Station 33      available_bikes
MAE:  1.2282002383790227
MSE:  4.005497020262217
RMSE:  2.001373783245453
R2:   0.9272505918404965
```



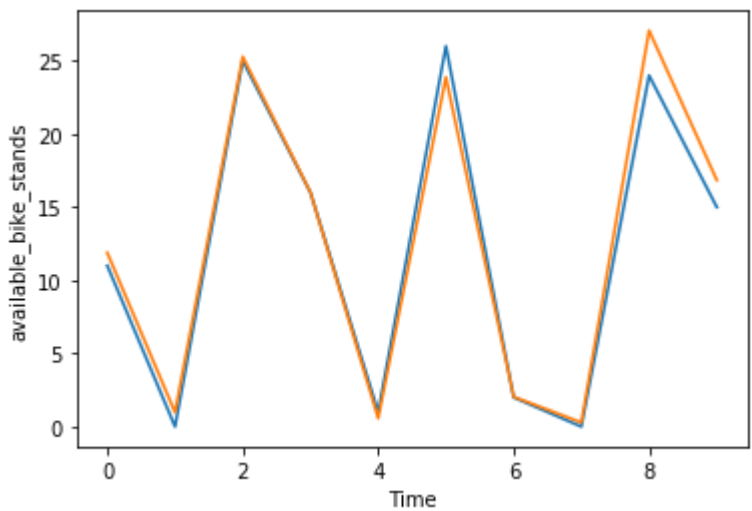
```
=====
=
Station 33      available_bike_stands
MAE:  1.2337187127532776
MSE:  3.998297139451728
RMSE:  1.9995742395449407
R2:   0.927644609841094
```



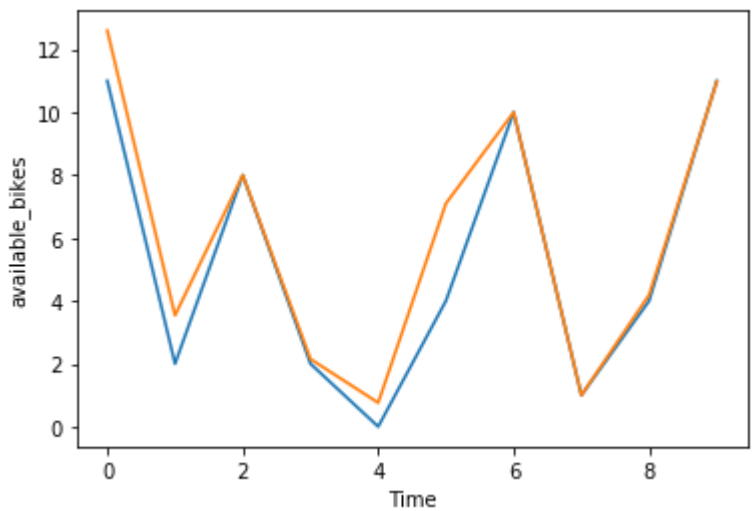
```
=====
=
Station 44      available_bikes
MAE:  0.8998331346841478
MSE:  2.070435041716329
RMSE:  1.4389006364986878
R2:   0.9817520916279641
```



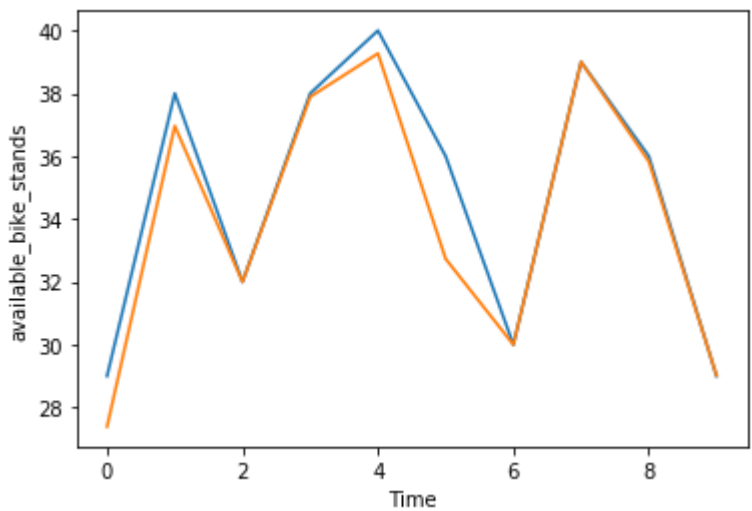
```
=====
=
Station 44      available_bike_stands
MAE:  0.905792610250298
MSE:  2.0709451728247914
RMSE:  1.4390778897699705
R2:   0.9817392992623502
```



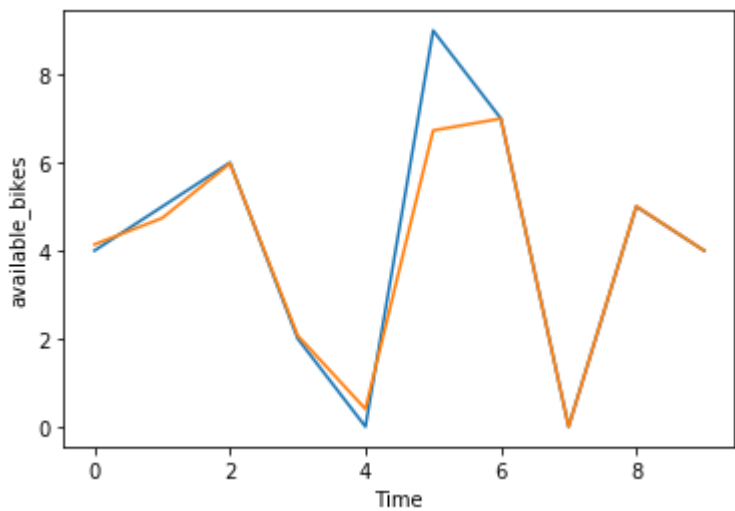
```
=====
=
Station 89      available_bikes
MAE:  0.6619666269368295
MSE:  2.1197469606674613
RMSE:  1.4559350811995229
R2:   0.9570622199785193
```



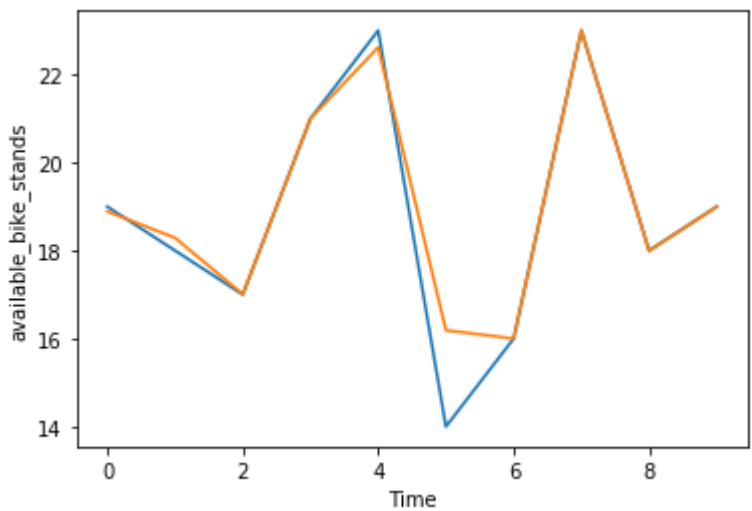
```
=====
=
Station 89      available_bike_stands
MAE:  0.6617163289630513
MSE:  2.136682955899881
RMSE:  1.4617397018278873
R2:   0.956803733035183
```

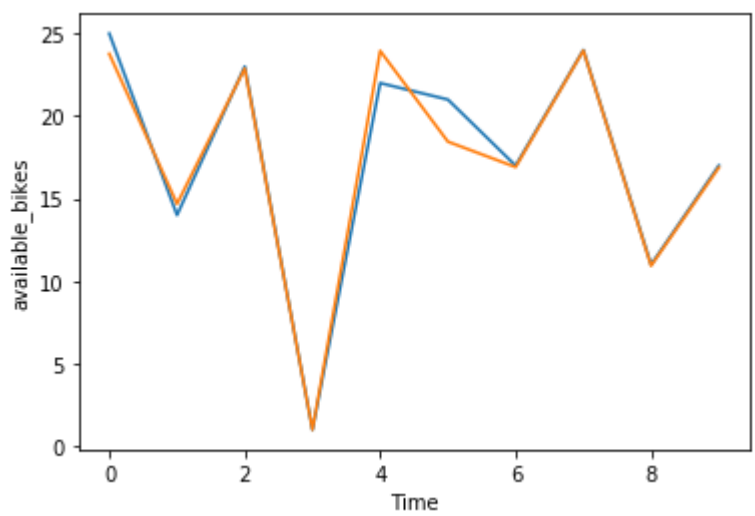
```
=====
=
Station 57      available_bikes
MAE:  0.48561382598331343
MSE:  1.2785295589988082
RMSE:  1.1307208139053637
R2:   0.9669002372964687
```



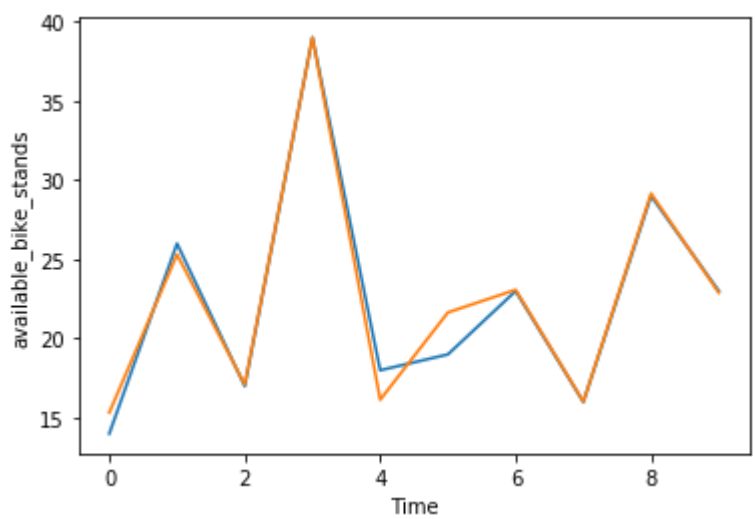
```
=====
=
Station 57      available_bike_stands
MAE:  0.482777115613826
MSE:  1.2470783075089393
RMSE:  1.1167266037437003
R2:   0.9677711726614453
```



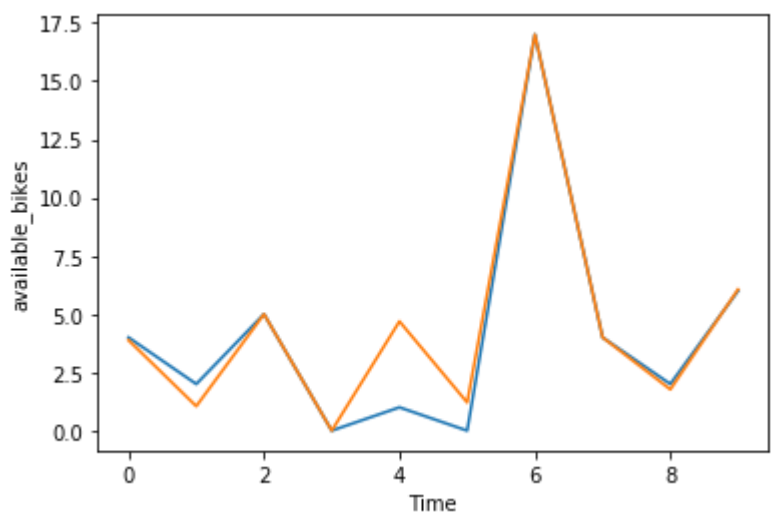
```
=====
=
Station 80      available_bikes
MAE:  0.8018116805721097
MSE:  2.941100357568534
RMSE:  1.7149636607136998
R2:   0.9624522223551417
```



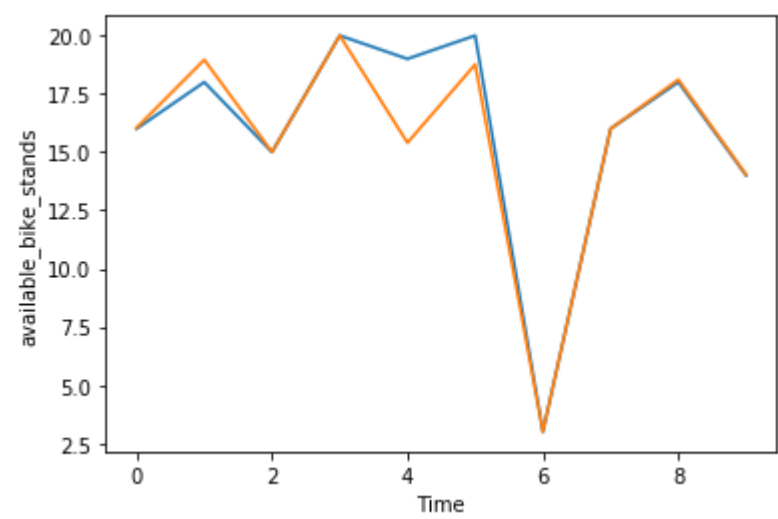
```
=====
=
Station 80      available_bike_stands
MAE:  0.8104171632896305
MSE:  3.008620977353993
RMSE:  1.734537684039754
R2:   0.9616906309751226
```



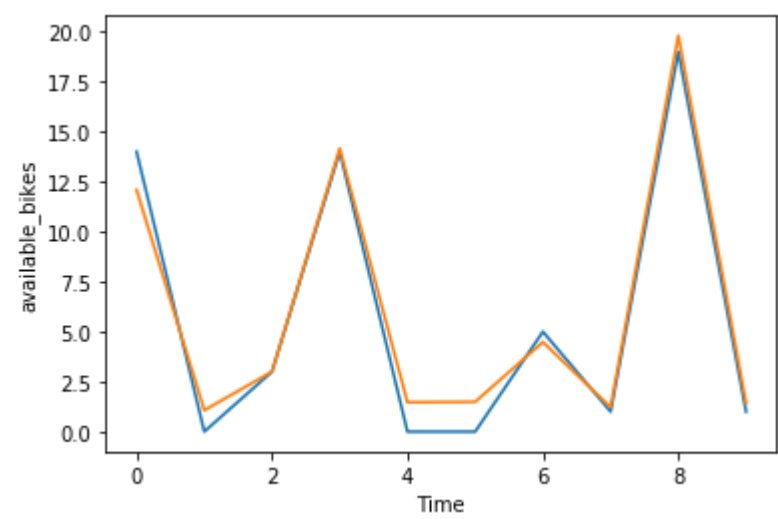
```
=====
=
Station 41      available_bikes
MAE:  0.513969010727056
MSE:  0.9743315852205005
RMSE:  0.9870823598973393
R2:   0.9742092217504094
```



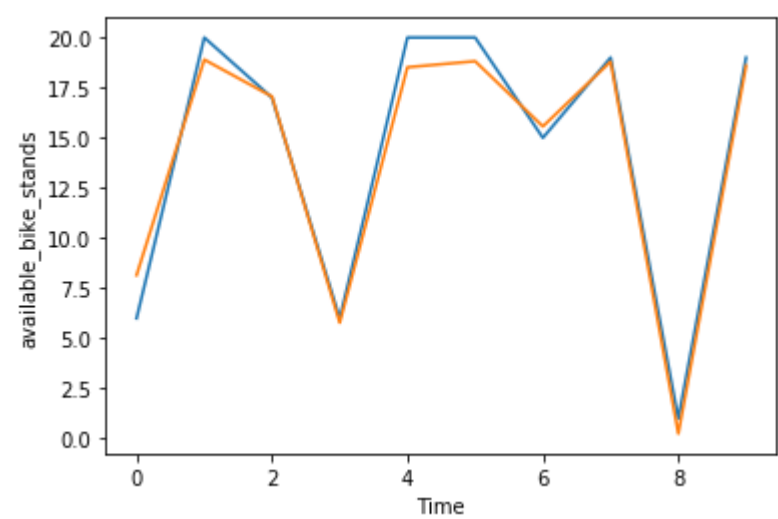
```
=====
=
Station 41      available_bike_stands
MAE:  0.5144219308700835
MSE:  0.9755752085816447
RMSE:  0.9877121081477359
R2:   0.9742821857943962
```



```
=====
=
Station 3       available_bikes
MAE:  0.6995714285714284
MSE:  1.292532619047619
RMSE:  1.136896045840436
R2:   0.9408077748567835
```



```
=====
=
Station 3       available_bike_stands
MAE:  0.6980357142857143
MSE:  1.2678172619047618
RMSE:  1.1259739170623633
R2:   0.9418908403351574
```



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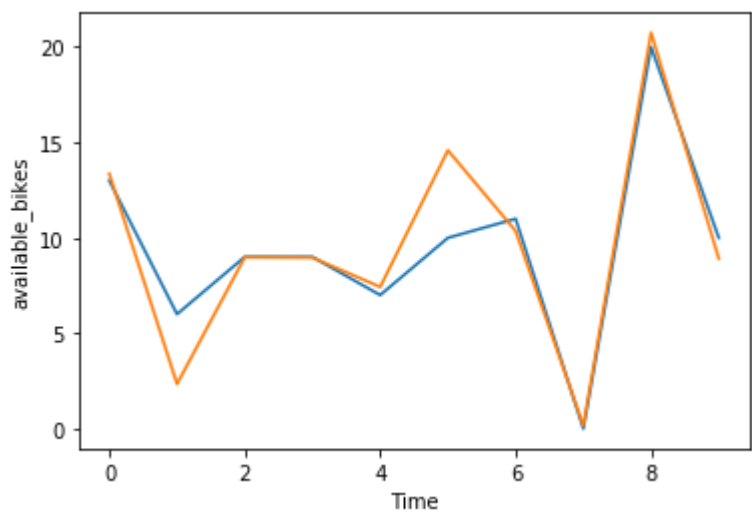
Station 40 available_bikes

MAE: 0.7995119047619047

MSE: 1.6194944047619044

RMSE: 1.272593574069076

R2: 0.9617704379395989



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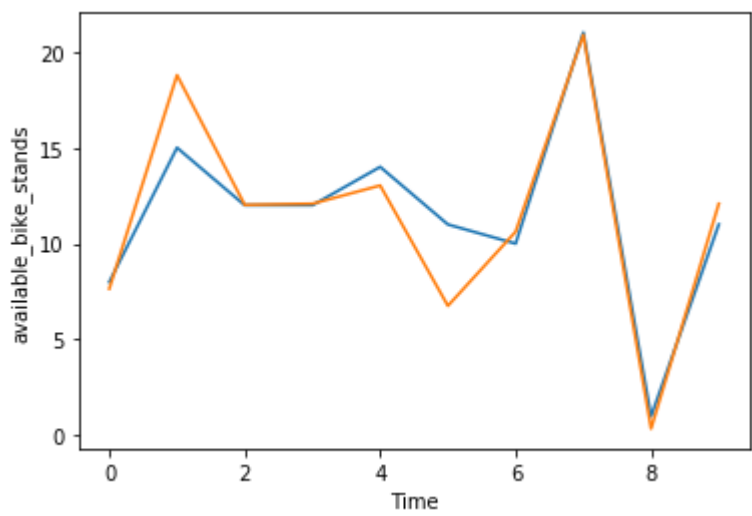
Station 40 available_bike_stands

MAE: 0.7920833333333333

MSE: 1.600864404761905

RMSE: 1.2652527039140857

R2: 0.9623659091893462



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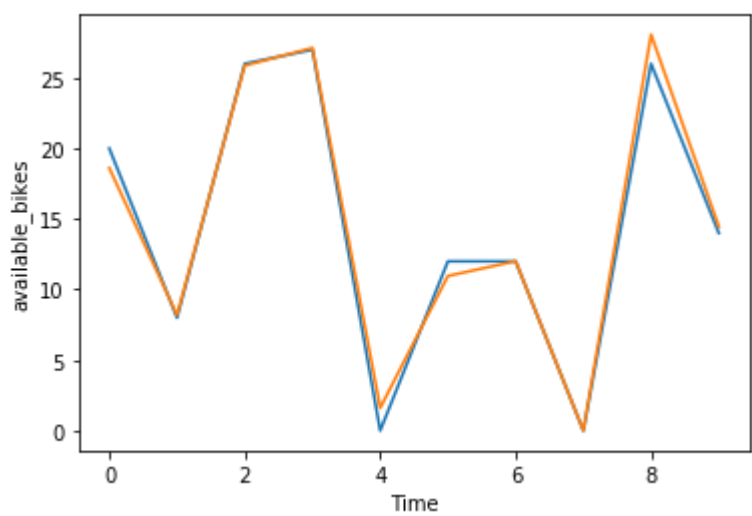
Station 29 available_bikes

MAE: 1.1193809523809524

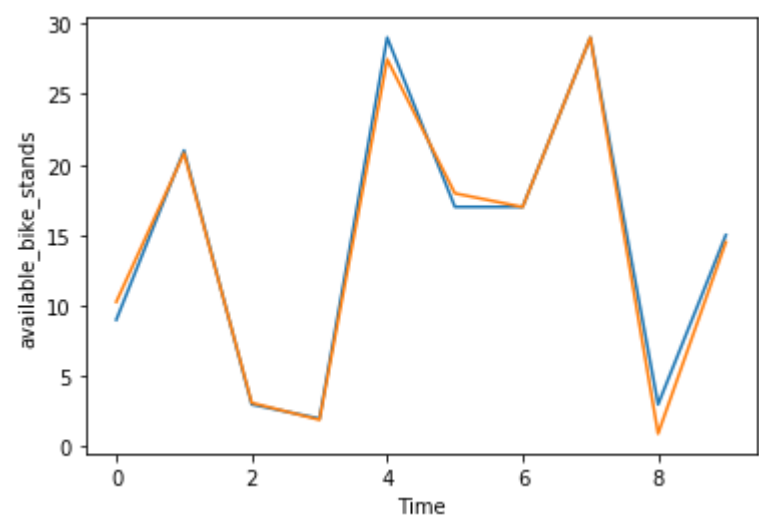
MSE: 4.046315714285715

RMSE: 2.0115456033323516

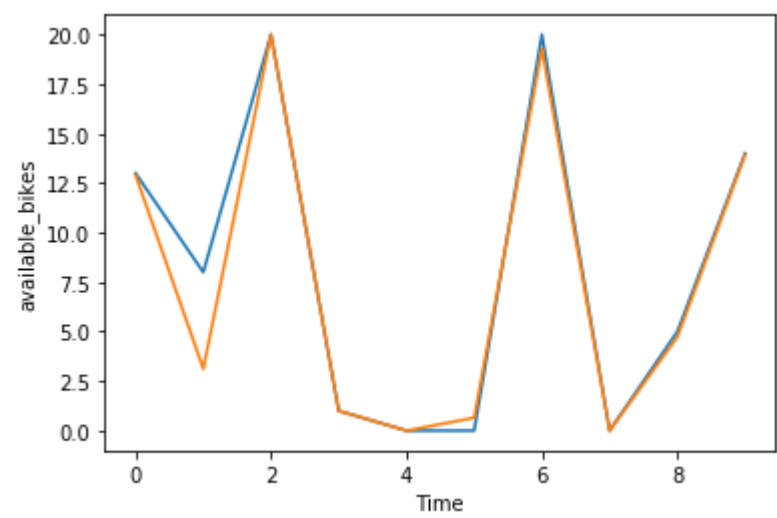
R2: 0.9529985764813703



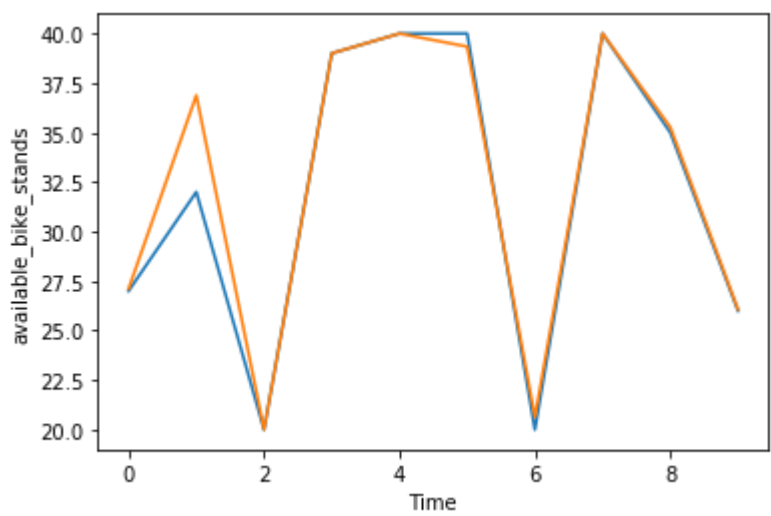
```
=====
=
Station 29      available_bike_stands
MAE:  1.1055
MSE:  3.913962619047619
RMSE:  1.9783737308829237
R2:   0.9543729518469112
```



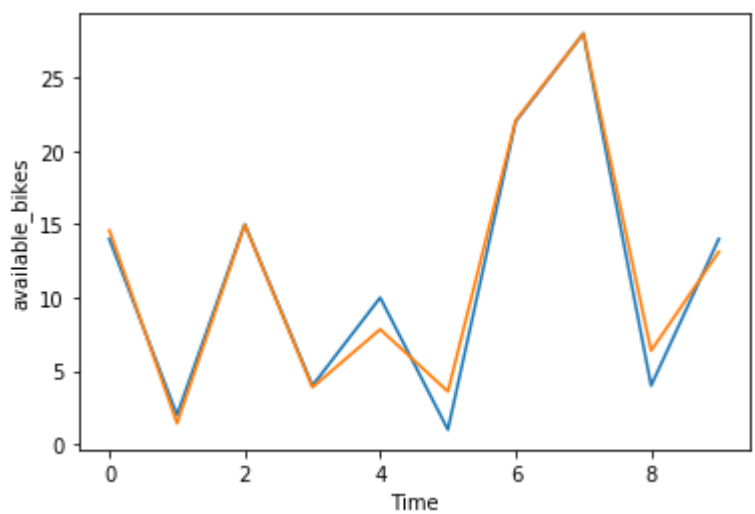
```
=====
=
Station 103     available_bikes
MAE:  0.3585952380952381
MSE:  0.9044269047619047
RMSE:  0.9510136196511092
R2:   0.982041518368955
```



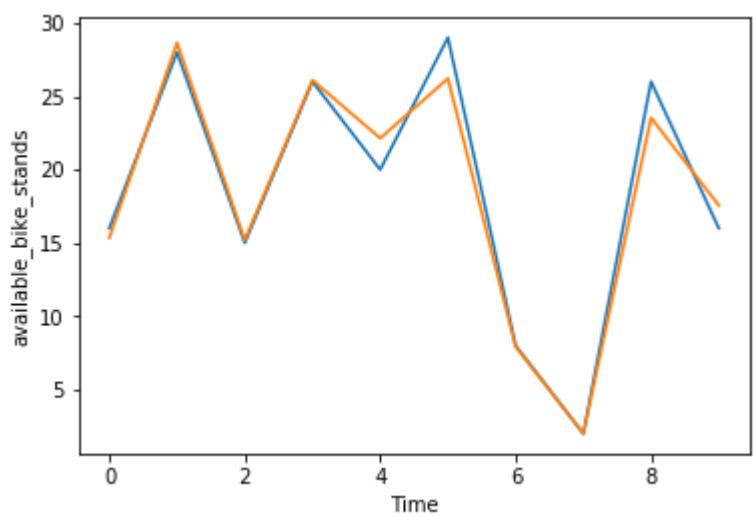
```
=====
=
Station 103      available_bike_stands
MAE:  0.3627619047619048
MSE:  0.9164550000000001
RMSE:  0.9573165620629365
R2:   0.9818585264419463
```



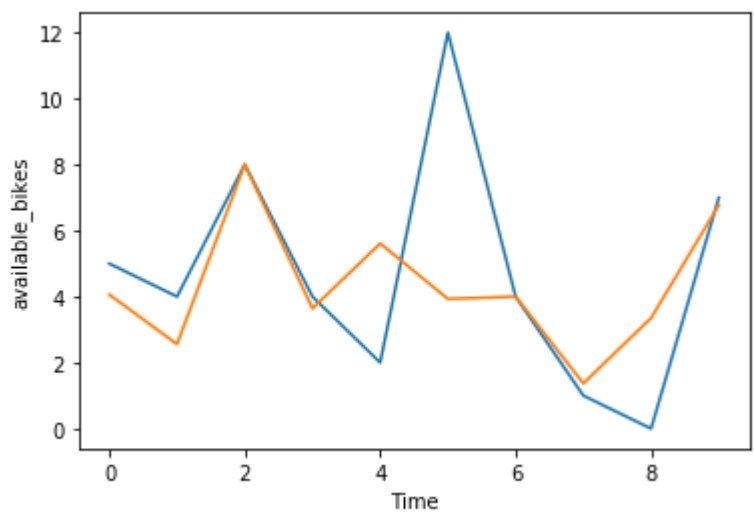
```
=====
=
Station 28      available_bikes
MAE:  1.0852738095238095
MSE:  3.589419642857143
RMSE:  1.8945763755671459
R2:    0.9447923139538683
```



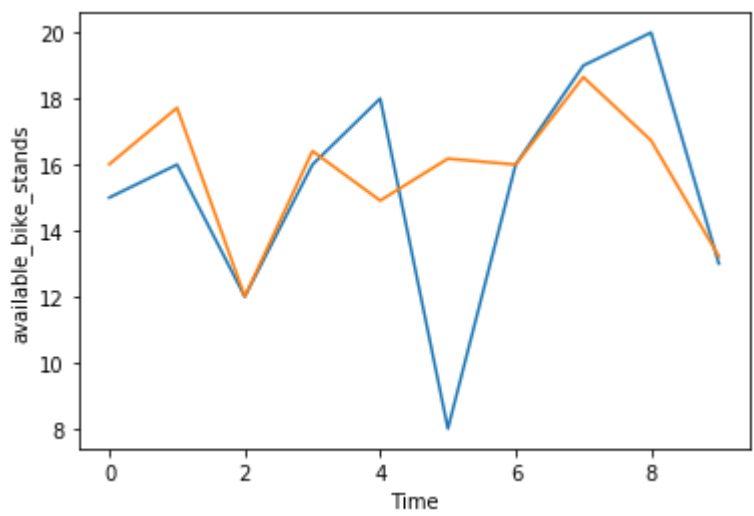
```
=====
=
Station 28      available_bike_stands
MAE:  1.0933928571428573
MSE:  3.617905119047619
RMSE:  1.9020791568827042
R2:    0.9451815559971926
```



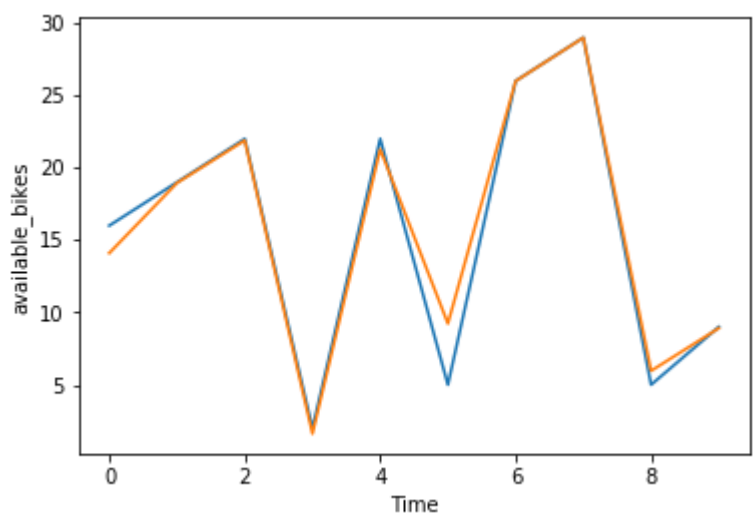
```
=====
=
Station 39      available_bikes
MAE:  0.763095238095238
MSE:  1.527420476190476
RMSE:  1.235885371223718
R2:   0.9193417429132854
```



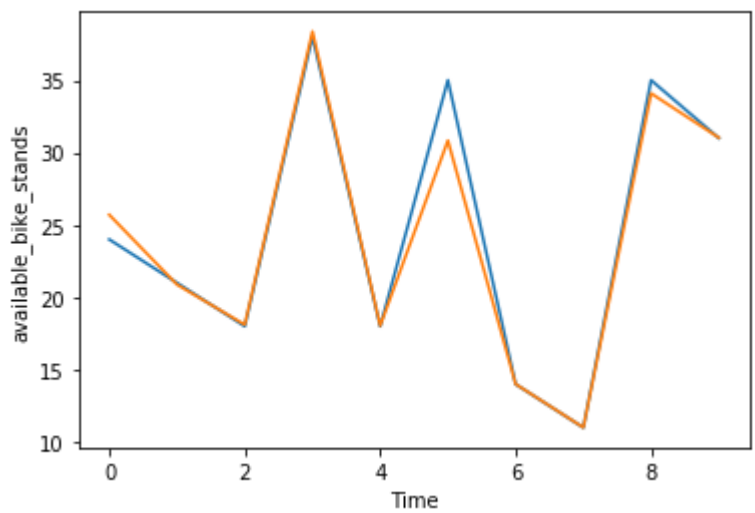
```
=====
=
Station 39      available_bike_stands
MAE:  0.767357142857143
MSE:  1.5176471428571428
RMSE:  1.2319282214711793
R2:   0.9189141515974533
```



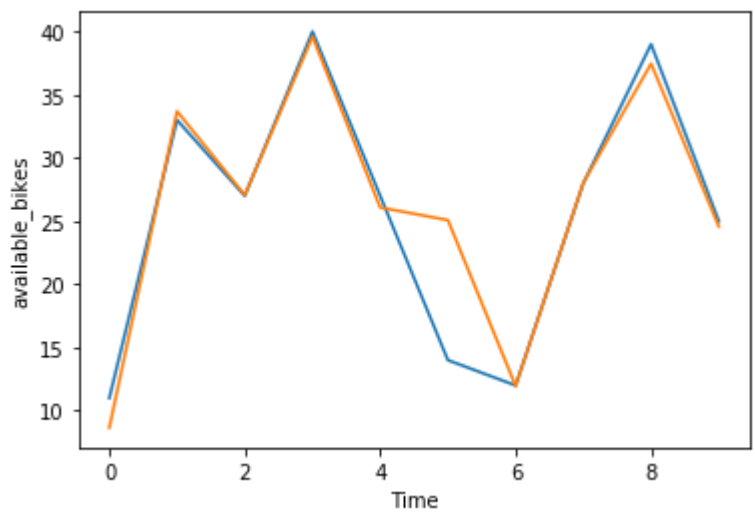
```
=====
=
Station 83      available_bikes
MAE:  0.7916309523809524
MSE:  1.9958289285714286
RMSE:  1.4127380962412774
R2:   0.9832861128483618
```



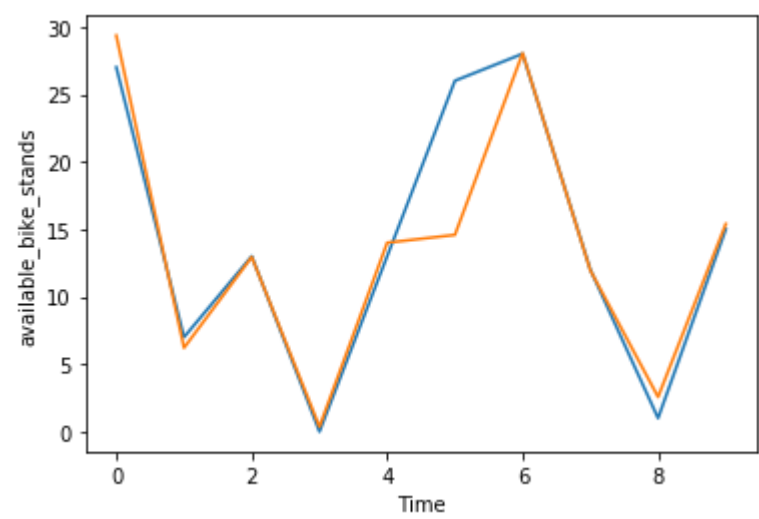
```
=====
=
Station 83      available_bike_stands
MAE:  0.7856547619047619
MSE:  1.9875915476190473
RMSE:  1.4098196862077956
R2:   0.9834005355595288
```



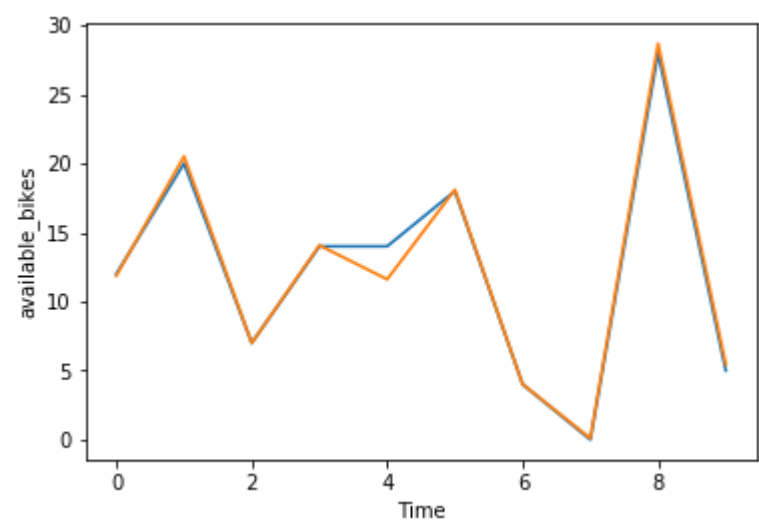
```
=====
=
Station 92      available_bikes
MAE:  0.8835833333333334
MSE:  3.802174404761905
RMSE:  1.9499165122542823
R2:   0.9780471381931606
```



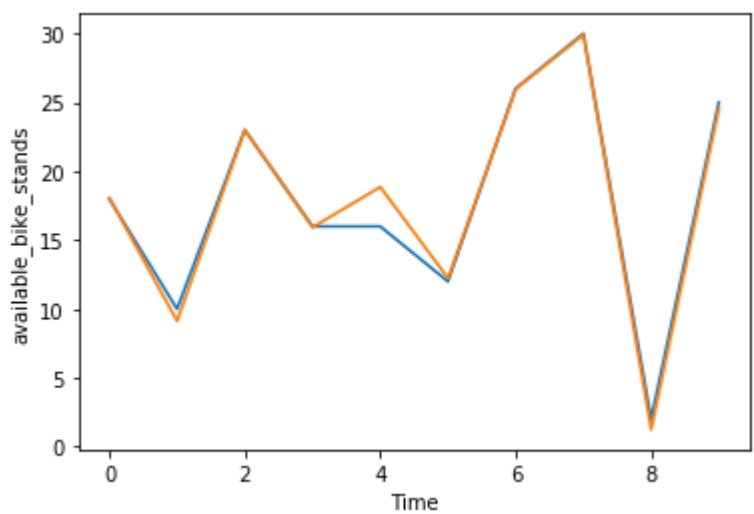

```
=====
=
Station 92      available_bike_stands
MAE:  0.8930476190476191
MSE:  3.8619473809523814
RMSE:  1.9651838033508167
R2:   0.9776625025293721
```



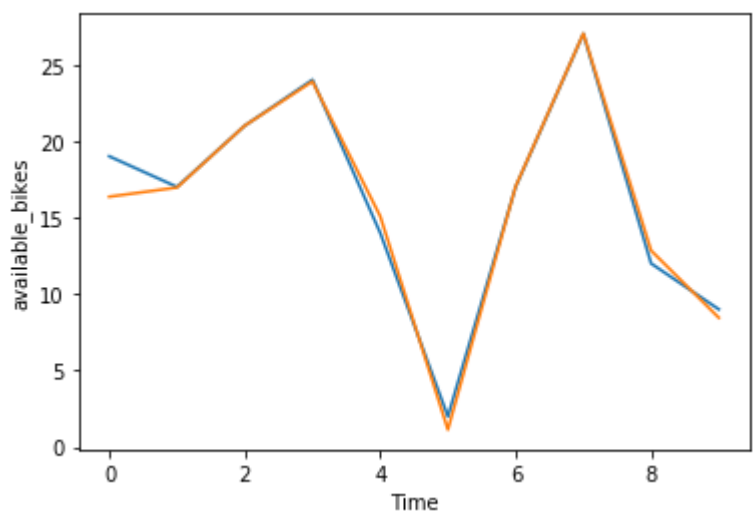
```
=====
=
Station 21      available_bikes
MAE:  0.8271904761904761
MSE:  1.9851633333333334
RMSE:  1.4089582439992085
R2:   0.9754830387702579
```



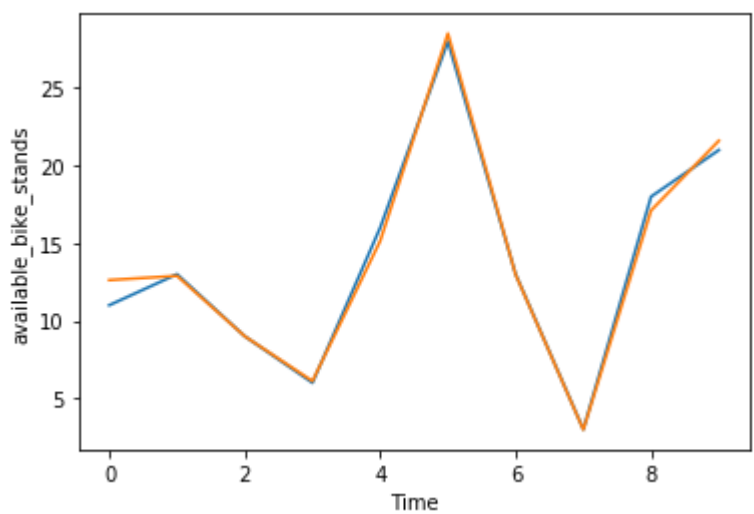
```
=====
=
Station 21      available_bike_stands
MAE:  0.8303214285714287
MSE:  1.9934048809523812
RMSE:  1.4118799102446289
R2:   0.9758059611040828
```



```
=====
=
Station 88      available_bikes
MAE:  0.6234404761904763
MSE:  0.9541684523809525
RMSE:  0.9768154648555439
R2:   0.9878823286792414
```



```
=====
=
Station 88      available_bike_stands
MAE:  0.616702380952381
MSE:  0.9479529761904762
RMSE:  0.9736287671337963
R2:   0.9878976940259074
```



In []: