Boston Housing Data Science ML Project HW - Sachdeva, Rohan

October 15, 2023

[1]:
```
!python --version
!pip show Numpy
```

```
Python 3.8.8
Name: numpy
Version: 1.20.0
Summary: NumPy is the fundamental package for array computing with Python.
Home-page: https://www.numpy.org
Author: Travis E. Oliphant et al.
Author-email: None
License: BSD
Location: c:\users\vshls\anaconda3\lib\site-packages
Requires:
Required-by: tifffile, tensorflow-intel, tensorboard, tables, statsmodels,
seaborn, scipy, scikit-learn, scikit-image, PyWavelets, python-louvain,
pyqtgraph, pyerfa, patsy, pandas, Orange3, opt-einsum, openTSNE, numexpr, numba,
mpl-scatter-density, mkl-random, mkl-fft, matplotlib, imageio, imagecodecs,
h5py, glue-vispy-viewers, glue-core, fast-histogram, echo, Bottleneck, bokeh,
bkcharts, baycomp, astropy
```

[2]:
```
#Starter Kaggle Code for Importing Data
import numpy as np # linear algebra
import pandas as pd # data processing, CSV file I/O (e.g. pd.read_csv)
# Input data files are available in the "../input/" directory.
# For example, running this (by clicking run or pressing Shift+Enter) will list␣
 ↪the files in the input directory
# Any results you write to the current directory are saved as output.
from pandas import read_csv
#Lets load the dataset and sample some
column_names = ['CRIM', 'ZN', 'INDUS', 'CHAS', 'NOX', 'RM', 'AGE', 'DIS', 'RAD',␣
 ↪'TAX', 'PTRATIO', 'B', 'LSTAT', 'MEDV']
data = read_csv('C:/Users/vshls/Downloads/housing.csv', header=None,␣
 ↪delimiter=r"\s+", names=column_names)
```

Linear Regression Model was adopted where we can see 80% of data for training and 20% for testing by default so that model can be trained on unseen data

[3]:
```
#Linear Regression Model and Model Information Code
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split
x = data[['CRIM', 'ZN', 'INDUS', 'CHAS', 'NOX', 'RM', 'AGE', 'DIS', 'RAD',␣
 ↪'TAX', 'PTRATIO', 'B', 'LSTAT']].values
y = data['MEDV'].values

xtrain, xtest, ytrain, ytest = train_test_split(x,y)

model = LinearRegression().fit(xtrain, ytrain)

print("Linear Regression Model Information: ")
print()
print("Coefficients: ")
print(model.coef_)
print()
print("Intercept: ")
print(model.intercept_)
print()
print("Rsq: ")
print(model.score(xtrain, ytrain))
```

```
Linear Regression Model Information:

Coefficients:
[-1.05133732e-01  3.98923361e-02  1.65453597e-02  3.53065985e+00
 -1.71467147e+01  4.62181130e+00  2.59129055e-03 -1.40234734e+00
  2.92675196e-01 -1.05181259e-02 -9.35884646e-01  1.03806816e-02
 -4.86407675e-01]

Intercept:
29.04656523718559

Rsq:
0.7543670425846429
```

R squared value shows the variation in the data that our model explains - so our linear regression model explains 72.7391% of the variation in median value of occupied homes

Predictions yield a more tangible feel for how the model acts on the data, and we can extract mean squared error and root mean squared error scores which can potentially motivate F-Statistical Tests. Note that an F statistic is unitless to yield an area under a curve while RMSE is the same units as our data observations.

[4]:
```
from sklearn.metrics import mean_squared_error, mean_squared_error

#Model Predictions on Testing Data
print("Testing Results: ")
```

```
linRegPredList = []
actualList = []
for index in range(len(xtest)):
    x = xtest[index]
    x = x.reshape(-1,13)
    y_prediction = float(model.predict(x))
    actual = ytest[index]
    print("Predicted House Price: ", y_prediction, "and Actual House Price: ",␣
 ↪actual)
    linRegPredList.append(y_prediction)
    actualList.append(actual)

# Calculate Mean Squared Error (MSE)
print("MSE: ")
mse = mean_squared_error(actualList, linRegPredList)
print(mse)

print("RMSE: ")
# Calculate Root Mean Squared Error (RMSE)
rmse = np.sqrt(mse)
print(rmse)
```

```
Testing Results:
Predicted House Price:  32.8642326402655 and Actual House Price:  31.6
Predicted House Price:  18.988896511104652 and Actual House Price:  18.5
Predicted House Price:  28.332310863120668 and Actual House Price:  24.4
Predicted House Price:  30.815114754073733 and Actual House Price:  30.8
Predicted House Price:  36.9489792965887 and Actual House Price:  38.7
Predicted House Price:  19.485177811608366 and Actual House Price:  17.1
Predicted House Price:  25.81093301959592 and Actual House Price:  23.3
Predicted House Price:  16.06181267397333 and Actual House Price:  17.4
Predicted House Price:  8.322858091410108 and Actual House Price:  14.6
Predicted House Price:  16.042131294201774 and Actual House Price:  14.9
Predicted House Price:  17.381123058114085 and Actual House Price:  19.1
Predicted House Price:  20.166744875335446 and Actual House Price:  16.2
Predicted House Price:  26.389289645584107 and Actual House Price:  22.0
Predicted House Price:  36.150120661360624 and Actual House Price:  46.7
Predicted House Price:  37.04898031422164 and Actual House Price:  35.2
Predicted House Price:  24.54256094174378 and Actual House Price:  24.7
Predicted House Price:  18.137869014105064 and Actual House Price:  14.5
Predicted House Price:  16.70925572063745 and Actual House Price:  23.1
Predicted House Price:  22.668909582688944 and Actual House Price:  21.2
Predicted House Price:  24.541805114218135 and Actual House Price:  29.6
Predicted House Price:  21.42853495693729 and Actual House Price:  22.0
Predicted House Price:  24.701603604367786 and Actual House Price:  22.9
Predicted House Price:  26.54500040056411 and Actual House Price:  29.8
Predicted House Price:  16.96635609170652 and Actual House Price:  17.5
Predicted House Price:  22.79912206746393 and Actual House Price:  50.0
```

```
Predicted House Price:  24.37330682541128 and Actual House Price:  23.1
Predicted House Price:  8.467600049962268 and Actual House Price:  7.2
Predicted House Price:  24.884339589439573 and Actual House Price:  24.8
Predicted House Price:  13.695004927547762 and Actual House Price:  18.2
Predicted House Price:  19.02681853104347 and Actual House Price:  15.4
Predicted House Price:  20.43659910916982 and Actual House Price:  15.2
Predicted House Price:  16.640866388316347 and Actual House Price:  18.6
Predicted House Price:  11.612115524288495 and Actual House Price:  6.3
Predicted House Price:  35.23333789585979 and Actual House Price:  33.8
Predicted House Price:  20.76331997075899 and Actual House Price:  22.0
Predicted House Price:  20.512077638335224 and Actual House Price:  19.2
Predicted House Price:  21.190918447937662 and Actual House Price:  17.8
Predicted House Price:  11.845769653199092 and Actual House Price:  16.5
Predicted House Price:  17.451800084549753 and Actual House Price:  15.1
Predicted House Price:  18.1750357369338 and Actual House Price:  16.6
Predicted House Price:  27.31253074825831 and Actual House Price:  24.5
Predicted House Price:  19.40477992844811 and Actual House Price:  18.4
Predicted House Price:  27.784688878673986 and Actual House Price:  23.9
Predicted House Price:  33.919787616864 and Actual House Price:  34.9
Predicted House Price:  13.127815757415584 and Actual House Price:  13.9
Predicted House Price:  31.180209804520995 and Actual House Price:  25.1
Predicted House Price:  29.95706812811117 and Actual House Price:  24.0
Predicted House Price:  24.717732960986975 and Actual House Price:  19.4
Predicted House Price:  22.583556678470135 and Actual House Price:  20.4
Predicted House Price:  39.46599747556679 and Actual House Price:  45.4
Predicted House Price:  23.502572318738743 and Actual House Price:  21.2
Predicted House Price:  20.455211827600337 and Actual House Price:  19.3
Predicted House Price:  15.461218125059661 and Actual House Price:  20.2
Predicted House Price:  25.03424676399512 and Actual House Price:  24.0
Predicted House Price:  29.480559977234837 and Actual House Price:  25.0
Predicted House Price:  13.833386716578515 and Actual House Price:  19.7
Predicted House Price:  29.850377450065512 and Actual House Price:  30.1
Predicted House Price:  27.03252282732015 and Actual House Price:  22.8
Predicted House Price:  23.14588346633203 and Actual House Price:  25.0
Predicted House Price:  32.84596993309773 and Actual House Price:  30.3
Predicted House Price:  8.510518850136439 and Actual House Price:  11.8
Predicted House Price:  16.868829556862963 and Actual House Price:  17.8
Predicted House Price:  30.839043768417472 and Actual House Price:  32.7
Predicted House Price:  22.869770250148882 and Actual House Price:  22.9
Predicted House Price:  27.04397595900728 and Actual House Price:  23.9
Predicted House Price:  24.158782204598133 and Actual House Price:  21.7
Predicted House Price:  19.089804551882146 and Actual House Price:  18.5
Predicted House Price:  23.111675238115346 and Actual House Price:  20.2
Predicted House Price:  25.194354971495514 and Actual House Price:  28.7
Predicted House Price:  15.26401507849823 and Actual House Price:  18.9
Predicted House Price:  20.299813779413036 and Actual House Price:  20.5
Predicted House Price:  11.999012163478312 and Actual House Price:  10.8
Predicted House Price:  28.662532728691968 and Actual House Price:  31.2
```

```
Predicted House Price:  31.681954606684087 and Actual House Price:  29.9
Predicted House Price:  21.032649831417913 and Actual House Price:  19.3
Predicted House Price:  25.296756713987943 and Actual House Price:  29.6
Predicted House Price:  20.53565952398219 and Actual House Price:  16.8
Predicted House Price:  17.22286837686751 and Actual House Price:  13.4
Predicted House Price:  28.719968925211013 and Actual House Price:  26.4
Predicted House Price:  23.566243132982933 and Actual House Price:  23.0
Predicted House Price:  40.54499824789278 and Actual House Price:  21.9
Predicted House Price:  24.137688566474786 and Actual House Price:  22.8
Predicted House Price:  23.70949065024206 and Actual House Price:  20.5
Predicted House Price:  26.73106425550354 and Actual House Price:  20.6
Predicted House Price:  14.808997540777176 and Actual House Price:  15.4
Predicted House Price:  23.829386842467134 and Actual House Price:  23.4
Predicted House Price:  13.274532855405788 and Actual House Price:  10.5
Predicted House Price:  19.578661326138075 and Actual House Price:  15.0
Predicted House Price:  22.308615355462983 and Actual House Price:  21.4
Predicted House Price:  18.672811884918044 and Actual House Price:  20.1
Predicted House Price:  22.67509629120881 and Actual House Price:  21.2
Predicted House Price:  20.15866056883759 and Actual House Price:  12.5
Predicted House Price:  22.147243934959597 and Actual House Price:  20.3
Predicted House Price:  17.080565508455926 and Actual House Price:  19.4
Predicted House Price:  19.964170452711645 and Actual House Price:  20.5
Predicted House Price:  39.36701811128658 and Actual House Price:  41.7
Predicted House Price:  26.41616903988784 and Actual House Price:  23.8
Predicted House Price:  15.570783340274852 and Actual House Price:  8.4
Predicted House Price:  21.498778179895815 and Actual House Price:  23.3
Predicted House Price:  24.27013171980631 and Actual House Price:  21.7
Predicted House Price:  29.042297159260915 and Actual House Price:  23.6
Predicted House Price:  17.835456335315214 and Actual House Price:  19.6
Predicted House Price:  24.1136903031126 and Actual House Price:  17.8
Predicted House Price:  16.858369489332436 and Actual House Price:  13.1
Predicted House Price:  19.980412147928252 and Actual House Price:  18.4
Predicted House Price:  13.949088078873954 and Actual House Price:  14.5
Predicted House Price:  26.019969920455335 and Actual House Price:  26.5
Predicted House Price:  18.2255255494724 and Actual House Price:  14.1
Predicted House Price:  26.68313280381969 and Actual House Price:  15.0
Predicted House Price:  20.625050695088586 and Actual House Price:  22.9
Predicted House Price:  20.062680820016652 and Actual House Price:  19.4
Predicted House Price:  31.88477206334078 and Actual House Price:  31.1
Predicted House Price:  17.524636974520558 and Actual House Price:  14.3
Predicted House Price:  28.39983015425021 and Actual House Price:  28.0
Predicted House Price:  38.667764136101596 and Actual House Price:  37.6
Predicted House Price:  20.117731602656164 and Actual House Price:  15.3
Predicted House Price:  13.480871385180677 and Actual House Price:  13.4
Predicted House Price:  12.469248724831019 and Actual House Price:  13.6
Predicted House Price:  23.439343126231847 and Actual House Price:  18.9
Predicted House Price:  9.15153302684135 and Actual House Price:  13.2
Predicted House Price:  22.600271367147506 and Actual House Price:  16.5
```

```
Predicted House Price:  19.916229457127237 and Actual House Price:  24.3
Predicted House Price:  15.990696207678464 and Actual House Price:  17.6
Predicted House Price:  15.177412081561016 and Actual House Price:  16.2
Predicted House Price:  22.117055656880247 and Actual House Price:  21.4
Predicted House Price:  37.52447033811366 and Actual House Price:  44.0
Predicted House Price:  23.118288043310475 and Actual House Price:  19.4
MSE:
20.703611180037004
RMSE:
4.550122106057925
```

Scatter Plot with Line of Best Fit shown

[5]:
```
import plotly.express as px
import plotly.graph_objects as go
import pandas as pd

linRegPerf = px.scatter(x = actualList, y = linRegPredList, trendline = "ols")
linRegPerf.show()
#x_values_y_equals_x = list(range(-10, 11))
#y_values_y_equals_x = x_values_y_equals_x
#linRegPerf = px.line(df, x="x", y="y", title="Unsorted Input")

# Create a figure for the first plot
#linRegPerf = go.Figure()

# Add a trace to the figure (e.g., a line plot)

#linRegPerf.add_trace(px.scatter(x=actualList, y=linRegPredList))

# Update the layout if needed
#linRegPerf.update_layout(title='Multiple Plots with y = x')

# Create some sample data for y = x
#x_values_y_equals_x = list(range(-10, 11))
#y_values_y_equals_x = x_values_y_equals_x

# Add a new trace for y = x
#linRegPerf.add_trace(go.Scatter(x=x_values_y_equals_x, y=y_values_y_equals_x,␣
 ↪mode='markers', name='y = x'))

# Display the updated figure
#linRegPerf = px.scatter(x = actualList, y = linRegPredList)
#linRegPerf.show()
#fig = go.Figure(data=go.Scatter(x=actualList, y=actualList))
#fig.show()
```

[6]:
```
#Using Orange Data Mining software, we learned AdaBoost is the best standard␣
 ↪technique for this data.
from sklearn.tree import *
from sklearn.ensemble import *

rng = np.random.RandomState(1)

adaboostR = AdaBoostRegressor(DecisionTreeRegressor(max_depth=4),␣
 ↪n_estimators=300, random_state=rng)

adaboostR.fit(xtrain, ytrain)

print("AdaBoost Model Regression Score:")
print()
print("Rsq: ")
print(adaboostR.score(xtrain, ytrain))

#from sklearn import preprocessing
#ytrainCat = preprocessing.LabelEncoder().fit_transform(y)

#adaboost = AdaBoostClassifier(n_estimators=100, base_estimator=␣
 ↪DecisionTreeClassifier(max_depth= 1),learning_rate=1, algorithm='SAMME.R',␣
 ↪random_state = None)
#adaboost.fit(xtrain,ytrainCat)



#print("AdaBoost Model Regression Score:")
#print()
#print("Rsq: ")
#print(adaboost.score(xtrain, ytrainCat))
#throws an error: ValueError: Found input variables with inconsistent numbers of␣
 ↪samples: [379, 506]
```

```
AdaBoost Model Regression Score:

Rsq:
0.9593838922471113
```

Our AdaBoost model explains 94.6611% of the variation in median value of occupied homes.

[7]:
```
#Model Predictions on Testing Data
print("Testing Results: ")
adaBoostPredList = []
actualList = []
for index in range(len(xtest)):
    x = xtest[index]
    x = x.reshape(-1,13)
```

```
    y_prediction = float(adaboostR.predict(x))
    actual = ytest[index]
    print("Predicted House Price: ", y_prediction, "and Actual House Price: ",␣
 ↪actual)
    adaBoostPredList.append(y_prediction)
    actualList.append(actual)

# Calculate Mean Squared Error (MSE)
print("MSE: ")
mse = mean_squared_error(actualList, adaBoostPredList)
print(mse)

print("RMSE: ")
# Calculate Root Mean Squared Error (RMSE)
rmse = np.sqrt(mse)
print(rmse)
```

```
Testing Results:
Predicted House Price:  31.608163265306146 and Actual House Price:  31.6
Predicted House Price:  20.424999999999997 and Actual House Price:  18.5
Predicted House Price:  25.961538461538456 and Actual House Price:  24.4
Predicted House Price:  26.025 and Actual House Price:  30.8
Predicted House Price:  42.96666666666666 and Actual House Price:  38.7
Predicted House Price:  21.484210526315792 and Actual House Price:  17.1
Predicted House Price:  26.79999999999999 and Actual House Price:  23.3
Predicted House Price:  15.349324324324341 and Actual House Price:  17.4
Predicted House Price:  15.25 and Actual House Price:  14.6
Predicted House Price:  14.66265060240965 and Actual House Price:  14.9
Predicted House Price:  16.596116504854383 and Actual House Price:  19.1
Predicted House Price:  20.814655172413783 and Actual House Price:  16.2
Predicted House Price:  25.8 and Actual House Price:  22.0
Predicted House Price:  44.900000000000006 and Actual House Price:  46.7
Predicted House Price:  43.425 and Actual House Price:  35.2
Predicted House Price:  24.820909090909122 and Actual House Price:  24.7
Predicted House Price:  19.88085106382979 and Actual House Price:  14.5
Predicted House Price:  19.88085106382979 and Actual House Price:  23.1
Predicted House Price:  23.164062499999964 and Actual House Price:  21.2
Predicted House Price:  25.52656250000002 and Actual House Price:  29.6
Predicted House Price:  20.11458333333334 and Actual House Price:  22.0
Predicted House Price:  23.697029702970312 and Actual House Price:  22.9
Predicted House Price:  23.43214285714288 and Actual House Price:  29.8
Predicted House Price:  18.6125 and Actual House Price:  17.5
Predicted House Price:  31.5 and Actual House Price:  50.0
Predicted House Price:  21.826881720430112 and Actual House Price:  23.1
Predicted House Price:  10.635714285714286 and Actual House Price:  7.2
Predicted House Price:  26.450588235294124 and Actual House Price:  24.8
Predicted House Price:  20.219999999999995 and Actual House Price:  18.2
Predicted House Price:  14.934482758620694 and Actual House Price:  15.4
```

```
Predicted House Price:  16.219047619047622 and Actual House Price:  15.2
Predicted House Price:  23.18863636363636 and Actual House Price:  18.6
Predicted House Price:  11.27894736842105 and Actual House Price:  6.3
Predicted House Price:  33.75517241379311 and Actual House Price:  33.8
Predicted House Price:  21.668926553672318 and Actual House Price:  22.0
Predicted House Price:  20.115584415584404 and Actual House Price:  19.2
Predicted House Price:  15.2125 and Actual House Price:  17.8
Predicted House Price:  19.21215469613259 and Actual House Price:  16.5
Predicted House Price:  14.7512396694215 and Actual House Price:  15.1
Predicted House Price:  20.359900990098982 and Actual House Price:  16.6
Predicted House Price:  25.716666666666665 and Actual House Price:  24.5
Predicted House Price:  15.9625 and Actual House Price:  18.4
Predicted House Price:  26.771428571428572 and Actual House Price:  23.9
Predicted House Price:  32.829292929292905 and Actual House Price:  34.9
Predicted House Price:  16.903030303030302 and Actual House Price:  13.9
Predicted House Price:  25.633333333333333 and Actual House Price:  25.1
Predicted House Price:  25.746715328467186 and Actual House Price:  24.0
Predicted House Price:  21.7695652173913 and Actual House Price:  19.4
Predicted House Price:  22.612500000000015 and Actual House Price:  20.4
Predicted House Price:  46.955172413793086 and Actual House Price:  45.4
Predicted House Price:  22.141406249999992 and Actual House Price:  21.2
Predicted House Price:  20.79791666666667 and Actual House Price:  19.3
Predicted House Price:  19.67142857142858 and Actual House Price:  20.2
Predicted House Price:  21.995384615384616 and Actual House Price:  24.0
Predicted House Price:  29.21935483870968 and Actual House Price:  25.0
Predicted House Price:  18.681818181818187 and Actual House Price:  19.7
Predicted House Price:  26.200000000000003 and Actual House Price:  30.1
Predicted House Price:  23.43214285714288 and Actual House Price:  22.8
Predicted House Price:  24.839393939393965 and Actual House Price:  25.0
Predicted House Price:  29.94728260869567 and Actual House Price:  30.3
Predicted House Price:  15.144444444444442 and Actual House Price:  11.8
Predicted House Price:  16.018181818181816 and Actual House Price:  17.8
Predicted House Price:  31.451999999999988 and Actual House Price:  32.7
Predicted House Price:  21.97411167512689 and Actual House Price:  22.9
Predicted House Price:  24.790666666666656 and Actual House Price:  23.9
Predicted House Price:  21.721311475409856 and Actual House Price:  21.7
Predicted House Price:  21.03 and Actual House Price:  18.5
Predicted House Price:  21.08257575757575 and Actual House Price:  20.2
Predicted House Price:  25.75 and Actual House Price:  28.7
Predicted House Price:  19.71870503597123 and Actual House Price:  18.9
Predicted House Price:  18.244444444444444 and Actual House Price:  20.5
Predicted House Price:  10.638805970149262 and Actual House Price:  10.8
Predicted House Price:  30.314018691588732 and Actual House Price:  31.2
Predicted House Price:  28.045833333333345 and Actual House Price:  29.9
Predicted House Price:  21.973333333333336 and Actual House Price:  19.3
Predicted House Price:  33.44791666666665 and Actual House Price:  29.6
Predicted House Price:  20.43157894736843 and Actual House Price:  16.8
Predicted House Price:  14.826086956521744 and Actual House Price:  13.4
```

```
Predicted House Price:  25.24705882352941 and Actual House Price:  26.4
Predicted House Price:  24.721138211382097 and Actual House Price:  23.0
Predicted House Price:  46.05499999999999 and Actual House Price:  21.9
Predicted House Price:  23.35360824742268 and Actual House Price:  22.8
Predicted House Price:  22.578181818181807 and Actual House Price:  20.5
Predicted House Price:  21.826881720430112 and Actual House Price:  20.6
Predicted House Price:  15.016666666666667 and Actual House Price:  15.4
Predicted House Price:  25.090350877193 and Actual House Price:  23.4
Predicted House Price:  9.846341463414639 and Actual House Price:  10.5
Predicted House Price:  21.995384615384616 and Actual House Price:  15.0
Predicted House Price:  20.31797752808989 and Actual House Price:  21.4
Predicted House Price:  18.457391304347833 and Actual House Price:  20.1
Predicted House Price:  20.814655172413783 and Actual House Price:  21.2
Predicted House Price:  14.931111111111116 and Actual House Price:  12.5
Predicted House Price:  22.08252427184465 and Actual House Price:  20.3
Predicted House Price:  17.13846153846154 and Actual House Price:  19.4
Predicted House Price:  21.995384615384616 and Actual House Price:  20.5
Predicted House Price:  48.07058823529412 and Actual House Price:  41.7
Predicted House Price:  22.522580645161295 and Actual House Price:  23.8
Predicted House Price:  11.37837837837838 and Actual House Price:  8.4
Predicted House Price:  24.708235294117646 and Actual House Price:  23.3
Predicted House Price:  19.980000000000008 and Actual House Price:  21.7
Predicted House Price:  25.69655172413793 and Actual House Price:  23.6
Predicted House Price:  21.540229885057474 and Actual House Price:  19.6
Predicted House Price:  17.771428571428583 and Actual House Price:  17.8
Predicted House Price:  10.773076923076925 and Actual House Price:  13.1
Predicted House Price:  20.150793650793652 and Actual House Price:  18.4
Predicted House Price:  15.987499999999999 and Actual House Price:  14.5
Predicted House Price:  26.251111111111115 and Actual House Price:  26.5
Predicted House Price:  15.287499999999998 and Actual House Price:  14.1
Predicted House Price:  20.82222222222222 and Actual House Price:  15.0
Predicted House Price:  24.147619047619028 and Actual House Price:  22.9
Predicted House Price:  19.34274193548388 and Actual House Price:  19.4
Predicted House Price:  30.080000000000002 and Actual House Price:  31.1
Predicted House Price:  15.573809523809535 and Actual House Price:  14.3
Predicted House Price:  27.853658536585378 and Actual House Price:  28.0
Predicted House Price:  48.25 and Actual House Price:  37.6
Predicted House Price:  21.68405797101448 and Actual House Price:  15.3
Predicted House Price:  13.029508196721311 and Actual House Price:  13.4
Predicted House Price:  15.455555555555557 and Actual House Price:  13.6
Predicted House Price:  21.937037037037044 and Actual House Price:  18.9
Predicted House Price:  15.784337349397592 and Actual House Price:  13.2
Predicted House Price:  24.491666666666678 and Actual House Price:  16.5
Predicted House Price:  22.60526315789475 and Actual House Price:  24.3
Predicted House Price:  21.03 and Actual House Price:  17.6
Predicted House Price:  15.25128205128207 and Actual House Price:  16.2
Predicted House Price:  19.190344827586202 and Actual House Price:  21.4
Predicted House Price:  41.76451612903224 and Actual House Price:  44.0
```

```
Predicted House Price:  21.08257575757575 and Actual House Price:  19.4
MSE:
15.399032411329177
RMSE:
3.9241600899210494
```

Scatterplot of predicted vs. actual gives us a better feel of the improvement between the Linear Regression and AdaBoost Models

[8]:
```
adaBoost = px.scatter(x = actualList, y = adaBoostPredList, trendline = "ols")
adaBoost.show()
```