

# Kaggle Store Item Demand Forecasting Challenge using XGBoost

September 12, 2020

```
[1]: import pandas as pd  
import numpy as np
```

```
[2]: train=pd.read_csv("https://raw.githubusercontent.com/aastha12/Machine-Learning/  
→master/Ensemble-Learning/train.csv")
```

```
[3]: train.head()
```

```
[3]:      date  store  item  sales  
0  2013-01-01      1     1     13  
1  2013-01-02      1     1     11  
2  2013-01-03      1     1     14  
3  2013-01-04      1     1     13  
4  2013-01-05      1     1     10
```

```
[7]: train.describe()
```

```
[7]:      store      item      sales  
count  913000.000000  913000.000000  913000.000000  
mean      5.500000     25.500000     52.250287  
std      2.872283     14.430878     28.801144  
min      1.000000     1.000000     0.000000  
25%      3.000000     13.000000     30.000000  
50%      5.500000     25.500000     47.000000  
75%      8.000000     38.000000     70.000000  
max     10.000000     50.000000    231.000000
```

25% of the items had sales lower than 30, 50% of the items had sales lower than 47 and 75% had sales lower than 70. Highest sales were 231.

```
[4]: test=pd.read_csv("https://raw.githubusercontent.com/aastha12/Machine-Learning/  
→master/Ensemble-Learning/test%20(1).csv")
```

```
[5]: test.head()
```

```
[5]:      id      date  store  item  
0    0  2018-01-01      1     1  
1    1  2018-01-02      1     1  
2    2  2018-01-03      1     1  
3    3  2018-01-04      1     1
```

## 1 Quick Visualizations

```
[65]: import plotly.express as px
```

```
[11]: #Converting date to datetime format
train['date']=pd.to_datetime(train['date'])
test['date']=pd.to_datetime(test['date'])

#Extracting dayofweek,dayofyear,year,month for training set

train['weekday']=train['date'].dt.dayofweek
train['dayofyear']=train['date'].dt.dayofyear
train['year']=train['date'].dt.year
train['month']=train['date'].dt.month

#Extracting dayofweek,dayofyear,year,month for testing set

test['weekday']=test['date'].dt.dayofweek
test['dayofyear']=test['date'].dt.dayofyear
test['year']=test['date'].dt.year
test['month']=test['date'].dt.month
```

```
[13]: px.box(x=train['year'],y=train['sales'],title="Yearly Sales")
```

Sales seemed to have increased on an yearly basis but not by that much.

```
[14]: px.line(x=train['date'],y=train['sales'],title="Daily Sales")
```

There seems to be seasonality in June

```
[15]: px.box(x=train['month'],y=train['sales'],title="Monthly Sales")
```

Sales are lowest during the beginning and end of the year but highest during the June-August. Could be an effect of the summer holidays?

## 2 Missing Values

```
[16]: train.isnull().sum()
```

```
[16]: date          0
      store         0
      item          0
      sales         0
      weekday       0
      dayofyear     0
      year          0
      month         0
```

dtype: int64

No missing Values

### 3 Outlier detection

```
[17]: train.skew()
```

```
[17]: store      0.000000  
      item      0.000000  
      sales     0.867112  
      weekday   -0.000615  
      dayofyear  0.000013  
      year      -0.000968  
      month     -0.009526  
      dtype: float64
```

No outliers as skewness is between -1 to +1

### 4 Modeling

```
[21]: train.columns
```

```
[21]: Index(['date', 'store', 'item', 'sales', 'weekday', 'dayofyear', 'year',  
        'month'],  
        dtype='object')
```

```
[24]: X=train.copy()  
      X.drop(['sales', 'date'],axis=1,inplace=True)  
      y=train['sales']  
  
      from sklearn.model_selection import train_test_split  
  
      #Splitting data into training and validation test  
      X_train,X_val,y_train,y_val=train_test_split(X,y,test_size=0.2,random_state=123)  
  
      print("Shape of training features:",X_train.shape)  
      print("Shape of training labels:",y_train.shape)  
      print("Shape of validation features:",X_val.shape)  
      print("Shape of validation labels:",y_val.shape)
```

Shape of training features: (730400, 6)

Shape of training labels: (730400,)

Shape of validation features: (182600, 6)

Shape of validation labels: (182600,)

```
[28]: from xgboost import XGBRegressor  
      from sklearn.model_selection import cross_val_score
```

```
[44]: xgb=XGBRegressor(random_state=123)

XBG_score=cross_val_score(xgb,X_train,y_train,cv=5,scoring='neg_mean_squared_error',verbose=15

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.

[CV] ...
[19:44:43] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] ... , score=-252.917, total= 18.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 18.6s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[19:45:02] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] ... , score=-235.279, total= 21.7s
[CV] ...

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 40.3s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[19:45:23] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] ... , score=-249.874, total= 22.1s
[CV] ...

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.0min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[19:45:46] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] ... , score=-259.442, total= 22.3s
[CV] ...

[Parallel(n_jobs=1)]: Done 4 out of 4 | elapsed: 1.4min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[19:46:08] WARNING: src/objective/regression_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.
```

```
[CV] ... , score=-259.035, total= 23.4s
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 1.8min remaining: 0.0s
```

```
[Parallel(n_jobs=1)]: Done 5 out of 5 | elapsed: 1.8min finished
```

```
[45]: print("MSE:", -XBG_score.mean())  
      print("RMSE:", np.sqrt(-XBG_score.mean()))
```

```
MSE: 251.30936005856182
```

```
RMSE: 15.85273982813576
```

Since this competition is judged based on the SMAPE score, we will be using that.

```
[46]: def smape(A, F):  
      return 100/len(A) * np.sum(2 * np.abs(F - A) / (np.abs(A) + np.abs(F)))
```

```
[47]: xgb.fit(X_train, y_train)  
      training_predictions=xgb.predict(X_train)  
      print("SMAPE score:", smape(y_train, training_predictions))
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

```
Series.base is deprecated and will be removed in a future version
```

```
[19:46:45] WARNING: src/objective/regression_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.
```

```
SMAPE score: 25.008847891566266
```

The SMAPE score is quite high considering the top scores on the leaderboard are somewhere near 12.

## 5 Hyperparameter tuning

```
[48]: xgb
```

```
[48]: XGBRegressor(base_score=0.5, booster='gbtree', colsample_bylevel=1,  
                  colsample_bynode=1, colsample_bytree=1, gamma=0,  
                  importance_type='gain', learning_rate=0.1, max_delta_step=0,  
                  max_depth=3, min_child_weight=1, missing=None, n_estimators=100,  
                  n_jobs=1, nthread=None, objective='reg:linear', random_state=123,  
                  reg_alpha=0, reg_lambda=1, scale_pos_weight=1, seed=None,  
                  silent=None, subsample=1, verbosity=1)
```

```
[49]: param_grid = {  
      'max_depth': [3, 4, 5, 6, 7, 8, 9, 10, 11, 12],  
      'min_child_weight': np.arange(0.0001, 0.5, 0.001),
```

```
'gamma': np.arange(0.0,40.0,0.005),
'learning_rate': np.arange(0.0005,0.3,0.0005),
'subsample': np.arange(0.01,1.0,0.01),}
```

[50]: *#Bayesian optimization over hyper parameters.*

```
from skopt import BayesSearchCV
```

[51]: tuned\_XGB=BayesSearchCV(xgb,param\_grid,cv=3,scoring='neg\_mean\_squared\_error',random\_state=123,

[52]: tuned\_XGB.fit(X\_train,y\_train)

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.

[19:47:49] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62, score=-144.720, total= 26.6s

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 26.5s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[19:48:15] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62, score=-144.047, total= 26.7s

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 53.2s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[19:48:42] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=34.345, learning\_rate=0.1105, max\_depth=4, min\_child\_weight=0.2311, subsample=0.62, score=-134.364, total= 26.4s

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=39.695, learning\_rate=0.2285, max\_depth=11, min\_child\_weight=0.0121, subsample=0.49

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:49:09] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=39.695, learning_rate=0.2285, max_depth=11, min_child_weight=0.0121,
subsample=0.49, score=-59.897, total= 1.5min
[CV] gamma=39.695, learning_rate=0.2285, max_depth=11, min_child_weight=0.0121,
subsample=0.49
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:50:40] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=39.695, learning_rate=0.2285, max_depth=11, min_child_weight=0.0121,
subsample=0.49, score=-59.470, total= 1.5min
[CV] gamma=39.695, learning_rate=0.2285, max_depth=11, min_child_weight=0.0121,
subsample=0.49
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:52:11] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=39.695, learning_rate=0.2285, max_depth=11, min_child_weight=0.0121,
subsample=0.49, score=-60.054, total= 1.3min
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.4min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:53:31] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43, score=-90.471, total= 26.0s
[CV]  gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 25.9s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:53:57] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43, score=-90.419, total= 27.2s
[CV]  gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 53.1s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:54:24] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=26.935000000000002, learning_rate=0.21, max_depth=4,
min_child_weight=0.0441, subsample=0.43, score=-87.627, total= 26.1s
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:54:50] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6, score=-69.256, total= 45.7s
[CV]  gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6
```



```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 45.6s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:55:36] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6, score=-69.935, total= 47.0s
[CV] gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.5min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:56:23] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=22.5, learning_rate=0.1065, max_depth=7, min_child_weight=0.3191,
subsample=0.6, score=-73.548, total= 45.2s
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 2.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 2.3min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:57:08] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004, score=-115.132, total= 26.7s
[CV] gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 26.6s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:57:35] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004, score=-119.860, total= 26.3s
[CV]  gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 53.0s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:58:01] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=13.235, learning_rate=0.136, max_depth=4, min_child_weight=0.3361,
subsample=0.48000000000000004, score=-120.429, total= 26.4s
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=16.490000000000002, learning_rate=0.17500000000000002, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.3min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:58:28] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=16.490000000000002, learning_rate=0.17500000000000002, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.8200000000000001,
score=-56.674, total= 53.0s
[CV]  gamma=16.490000000000002, learning_rate=0.17500000000000002, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 52.9s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[19:59:21] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=16.490000000000002, learning_rate=0.17500000000000002, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.8200000000000001,
score=-56.487, total= 1.1min
[CV]  gamma=16.490000000000002, learning_rate=0.17500000000000002, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.8200000000000001
```

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.0min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:00:26] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=16.490000000000002, learning\_rate=0.17500000000000002, max\_depth=9, min\_child\_weight=0.14709999999999998, subsample=0.8200000000000001, score=-56.731, total= 1.0min

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=30.32, learning\_rate=0.182, max\_depth=12, min\_child\_weight=0.0461, subsample=0.59

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.0min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.0min finished

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:01:29] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=30.32, learning\_rate=0.182, max\_depth=12, min\_child\_weight=0.0461, subsample=0.59, score=-59.035, total= 1.9min

[CV] gamma=30.32, learning\_rate=0.182, max\_depth=12, min\_child\_weight=0.0461, subsample=0.59

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.9min remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:03:23] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=30.32, learning\_rate=0.182, max\_depth=12, min\_child\_weight=0.0461, subsample=0.59, score=-58.967, total= 1.6min

[CV] gamma=30.32, learning\_rate=0.182, max\_depth=12, min\_child\_weight=0.0461, subsample=0.59

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 3.5min remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```

[20:05:00] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=30.32, learning_rate=0.182, max_depth=12, min_child_weight=0.0461,
subsample=0.59, score=-59.113, total= 1.4min
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001

[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.9min remaining:    0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.9min finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:06:26] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001, score=-377.836, total= 17.4s
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001

[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:  17.3s remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:06:43] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001, score=-385.143, total= 17.9s
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001

[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:  35.2s remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:07:01] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=30.715, learning_rate=0.0555, max_depth=3, min_child_weight=0.3681,
subsample=0.9400000000000001, score=-376.289, total= 17.5s
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001

```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 52.7s remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 52.8s finished
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:07:18] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001, score=-57.494, total= 1.1min
[CV] gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:08:25] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001, score=-57.213, total= 1.1min
[CV] gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.2min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:09:32] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=29.09, learning_rate=0.1865, max_depth=11, min_child_weight=0.1991,
subsample=0.8400000000000001, score=-57.593, total= 1.1min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.3min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:10:40] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001, score=-59.827, total= 37.3s
[CV]  gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 37.3s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:11:17] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001, score=-60.257, total= 39.7s
[CV]  gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.3min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:11:57] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=1.07, learning_rate=0.2965, max_depth=6, min_child_weight=0.3651,
subsample=0.6900000000000001, score=-61.128, total= 36.7s

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.9min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.9min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=36.725, learning_rate=0.0225, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.74

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:12:35] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=36.725, learning_rate=0.0225, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.74, score=-273.738, total=
58.6s
[CV]  gamma=36.725, learning_rate=0.0225, max_depth=9,
min_child_weight=0.14709999999999998, subsample=0.74
```

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 58.5s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:13:33] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=36.725, learning\_rate=0.0225, max\_depth=9,  
min\_child\_weight=0.14709999999999998, subsample=0.74, score=-278.782, total=1.2min

[CV] gamma=36.725, learning\_rate=0.0225, max\_depth=9,  
min\_child\_weight=0.14709999999999998, subsample=0.74

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:14:45] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=36.725, learning\_rate=0.0225, max\_depth=9,  
min\_child\_weight=0.14709999999999998, subsample=0.74, score=-279.499, total=1.5min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.7min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.7min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=37.565, learning\_rate=0.0455, max\_depth=12, min\_child\_weight=0.0461,  
subsample=0.65

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:16:18] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=37.565, learning\_rate=0.0455, max\_depth=12, min\_child\_weight=0.0461,  
subsample=0.65, score=-71.427, total= 2.5min

[CV] gamma=37.565, learning\_rate=0.0455, max\_depth=12, min\_child\_weight=0.0461,  
subsample=0.65

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 2.5min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[20:18:47] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=37.565, learning_rate=0.0455, max_depth=12, min_child_weight=0.0461,
subsample=0.65, score=-71.919, total= 2.4min
[CV]  gamma=37.565, learning_rate=0.0455, max_depth=12, min_child_weight=0.0461,
subsample=0.65

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.9min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:21:13] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=37.565, learning_rate=0.0455, max_depth=12, min_child_weight=0.0461,
subsample=0.65, score=-72.094, total= 2.6min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.5min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 7.5min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=31.330000000000002, learning_rate=0.0145, max_depth=12,
min_child_weight=0.0461, subsample=0.19
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:23:51] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=31.330000000000002, learning_rate=0.0145, max_depth=12,
min_child_weight=0.0461, subsample=0.19, score=-382.783, total= 2.1min
[CV]  gamma=31.330000000000002, learning_rate=0.0145, max_depth=12,
min_child_weight=0.0461, subsample=0.19

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 2.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:25:59] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=31.330000000000002, learning_rate=0.0145, max_depth=12,
min_child_weight=0.0461, subsample=0.19, score=-380.326, total= 2.3min
[CV]  gamma=31.330000000000002, learning_rate=0.0145, max_depth=12,
min_child_weight=0.0461, subsample=0.19
```



[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 4.4min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:28:14] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=31.330000000000002, learning\_rate=0.0145, max\_depth=12, min\_child\_weight=0.0461, subsample=0.19, score=-383.045, total= 2.2min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 6.6min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 6.6min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:30:28] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37, score=-381.668, total= 36.1s

[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 36.0s remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:31:04] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37, score=-382.478, total= 35.8s

[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 1.2min remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:31:40] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.  
[CV] gamma=29.965, learning\_rate=0.0545, max\_depth=3, min\_child\_weight=0.2661, subsample=0.37, score=-380.093, total= 35.9s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 1.8min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 1.8min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:32:19] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001, score=-61.225, total= 1.7min

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.7min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:34:00] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001, score=-61.560, total= 1.6min

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 3.3min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:35:38] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=6.575, learning\_rate=0.0945, max\_depth=9, min\_child\_weight=0.3191, subsample=0.8200000000000001, score=-61.761, total= 1.7min

```
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  5.0min remaining:    0.0s
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  5.0min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:37:24] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001,
score=-57.143, total= 1.8min
```

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:  1.8min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:39:10] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001,
score=-57.160, total= 1.6min
```

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:  3.4min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[20:40:46] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=4.4, learning_rate=0.264, max_depth=9,
min_child_weight=0.051100000000000007, subsample=0.8200000000000001,
score=-57.333, total= 1.6min
```

```
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  4.9min remaining:    0.0s
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  4.9min finished
```

```

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:42:24] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001, score=-114.187, total= 1.6min
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:44:03] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001, score=-111.151, total= 1.4min
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:45:29] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=14.15, learning_rate=0.0455, max_depth=9, min_child_weight=0.1561,
subsample=0.8200000000000001, score=-110.593, total= 1.4min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.5min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.5min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=15.645, learning_rate=0.20400000000000001, max_depth=10,
min_child_weight=0.2701, subsample=0.03

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

```

Series.base is deprecated and will be removed in a future version

[20:46:57] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=15.645, learning\_rate=0.20400000000000001, max\_depth=10, min\_child\_weight=0.2701, subsample=0.03, score=-73.085, total= 1.3min

[CV] gamma=15.645, learning\_rate=0.20400000000000001, max\_depth=10, min\_child\_weight=0.2701, subsample=0.03

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.3min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:48:16] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=15.645, learning\_rate=0.20400000000000001, max\_depth=10, min\_child\_weight=0.2701, subsample=0.03, score=-73.489, total= 1.3min

[CV] gamma=15.645, learning\_rate=0.20400000000000001, max\_depth=10, min\_child\_weight=0.2701, subsample=0.03

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.6min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:49:34] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=15.645, learning\_rate=0.20400000000000001, max\_depth=10, min\_child\_weight=0.2701, subsample=0.03, score=-73.858, total= 1.3min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 4.0min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 4.0min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:50:59] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99, score=-248.360, total= 38.7s

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 38.6s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:51:37] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99, score=-241.816, total= 35.8s

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 1.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:52:13] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=25.295, learning\_rate=0.067, max\_depth=4, min\_child\_weight=0.0301, subsample=0.99, score=-240.480, total= 36.5s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 1.8min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 1.9min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:52:53] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56, score=-62.631, total= 2.1min

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 2.1min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:54:57] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56, score=-62.412, total= 2.0min

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 4.1min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:56:57] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=14.58, learning\_rate=0.064, max\_depth=11, min\_child\_weight=0.4871, subsample=0.56, score=-62.787, total= 2.0min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 6.0min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 6.0min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=32.465, learning\_rate=0.1085, max\_depth=6, min\_child\_weight=0.2731, subsample=0.91

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[20:58:59] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=32.465, learning\_rate=0.1085, max\_depth=6, min\_child\_weight=0.2731, subsample=0.91, score=-85.978, total= 51.7s

[CV] gamma=32.465, learning\_rate=0.1085, max\_depth=6, min\_child\_weight=0.2731, subsample=0.91

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 51.7s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[20:59:51] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=32.465, learning_rate=0.1085, max_depth=6, min_child_weight=0.2731,
subsample=0.91, score=-85.379, total= 51.5s
[CV]  gamma=32.465, learning_rate=0.1085, max_depth=6, min_child_weight=0.2731,
subsample=0.91

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.7min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:00:43] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=32.465, learning_rate=0.1085, max_depth=6, min_child_weight=0.2731,
subsample=0.91, score=-83.939, total= 52.9s

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 2.6min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 2.6min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:01:40] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04, score=-212.158, total= 23.5s
[CV]  gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 23.4s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:02:03] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04, score=-214.967, total= 24.8s
[CV]  gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04
```



```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 48.2s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:02:28] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=3.3000000000000003, learning_rate=0.1135, max_depth=3,
min_child_weight=0.0201, subsample=0.04, score=-207.245, total= 23.7s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.2min remaining: 0.0s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.2min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:02:55] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001, score=-57.039, total= 1.6min
```

```
[CV] gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.6min remaining: 0.0s
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:04:31] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001, score=-57.271, total= 1.4min
```

```
[CV] gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.0min remaining: 0.0s
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:05:55] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=39.255, learning_rate=0.2655, max_depth=9, min_child_weight=0.3911,
subsample=0.8200000000000001, score=-57.460, total= 1.4min

[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.4min remaining:    0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   4.4min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[21:07:23] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19, score=-58.143, total=
1.4min
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19

[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.4min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[21:08:49] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19, score=-58.279, total=
1.4min
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19

[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.9min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[21:10:14] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=23.240000000000002, learning_rate=0.135, max_depth=10,
min_child_weight=0.24509999999999998, subsample=0.19, score=-58.149, total=
1.4min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.3min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:11:45] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001, score=-119.034, total= 1.5min
```

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:13:16] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001, score=-105.550, total= 1.6min
```

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:14:54] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=20.075, learning_rate=0.0445, max_depth=9, min_child_weight=0.1081,
subsample=0.7000000000000001, score=-113.943, total= 1.5min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=31.645, learning_rate=0.1855, max_depth=12, min_child_weight=0.2531,
subsample=0.18000000000000002
```

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:16:28] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=31.645, learning\_rate=0.1855, max\_depth=12, min\_child\_weight=0.2531, subsample=0.18000000000000002, score=-63.208, total= 1.8min

[CV] gamma=31.645, learning\_rate=0.1855, max\_depth=12, min\_child\_weight=0.2531, subsample=0.18000000000000002

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.8min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:18:17] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=31.645, learning\_rate=0.1855, max\_depth=12, min\_child\_weight=0.2531, subsample=0.18000000000000002, score=-62.810, total= 1.8min

[CV] gamma=31.645, learning\_rate=0.1855, max\_depth=12, min\_child\_weight=0.2531, subsample=0.18000000000000002

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 3.7min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:20:08] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=31.645, learning\_rate=0.1855, max\_depth=12, min\_child\_weight=0.2531, subsample=0.18000000000000002, score=-63.166, total= 1.8min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 5.5min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 5.5min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=37.095, learning\_rate=0.14350000000000002, max\_depth=9, min\_child\_weight=0.4741, subsample=0.21000000000000002

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[21:22:02] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=37.095, learning_rate=0.14350000000000002, max_depth=9,
min_child_weight=0.4741, subsample=0.21000000000000002, score=-58.191, total=
1.3min
[CV]  gamma=37.095, learning_rate=0.14350000000000002, max_depth=9,
min_child_weight=0.4741, subsample=0.21000000000000002

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.3min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
Series.base is deprecated and will be removed in a future version
```

```
[21:23:19] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=37.095, learning_rate=0.14350000000000002, max_depth=9,
min_child_weight=0.4741, subsample=0.21000000000000002, score=-58.314, total=
1.3min
[CV]  gamma=37.095, learning_rate=0.14350000000000002, max_depth=9,
min_child_weight=0.4741, subsample=0.21000000000000002

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
Series.base is deprecated and will be removed in a future version
```

```
[21:24:37] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=37.095, learning_rate=0.14350000000000002, max_depth=9,
min_child_weight=0.4741, subsample=0.21000000000000002, score=-58.333, total=
1.3min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9min finished
```

```
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
Series.base is deprecated and will be removed in a future version
```

```
[21:25:59] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004, score=-58.043, total= 1.9min
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.9min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:27:51] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004, score=-58.709, total= 2.0min
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.8min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:29:49] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=0.875, learning_rate=0.099, max_depth=10, min_child_weight=0.2491,
subsample=0.48000000000000004, score=-58.121, total= 2.0min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.8min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 5.8min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=22.22, learning_rate=0.0275, max_depth=4,
min_child_weight=0.28909999999999997, subsample=0.97
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:31:54] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=22.22, learning_rate=0.0275, max_depth=4,
min_child_weight=0.28909999999999997, subsample=0.97, score=-430.159, total=
39.0s
[CV]  gamma=22.22, learning_rate=0.0275, max_depth=4,
min_child_weight=0.28909999999999997, subsample=0.97
```

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 39.0s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:32:33] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=22.22, learning\_rate=0.0275, max\_depth=4,  
min\_child\_weight=0.28909999999999997, subsample=0.97, score=-429.273, total=41.4s

[CV] gamma=22.22, learning\_rate=0.0275, max\_depth=4,  
min\_child\_weight=0.28909999999999997, subsample=0.97

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 1.3min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:33:14] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=22.22, learning\_rate=0.0275, max\_depth=4,  
min\_child\_weight=0.28909999999999997, subsample=0.97, score=-433.094, total=50.2s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 2.2min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 2.2min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=10.51, learning\_rate=0.1585, max\_depth=7, min\_child\_weight=0.2691,  
subsample=0.11

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:34:09] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=10.51, learning\_rate=0.1585, max\_depth=7, min\_child\_weight=0.2691,  
subsample=0.11, score=-63.067, total= 1.3min

[CV] gamma=10.51, learning\_rate=0.1585, max\_depth=7, min\_child\_weight=0.2691,  
subsample=0.11

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.3min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[21:35:28] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=10.51, learning_rate=0.1585, max_depth=7, min_child_weight=0.2691,
subsample=0.11, score=-62.633, total= 1.3min
[CV]  gamma=10.51, learning_rate=0.1585, max_depth=7, min_child_weight=0.2691,
subsample=0.11

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.6min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:36:48] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=10.51, learning_rate=0.1585, max_depth=7, min_child_weight=0.2691,
subsample=0.11, score=-62.383, total= 1.3min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.9min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:38:09] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16, score=-74.353, total= 1.1min
[CV]  gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:39:15] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16, score=-75.826, total= 1.1min
[CV]  gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16
```



```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.2min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:40:21] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=17.82, learning_rate=0.0955, max_depth=7, min_child_weight=0.2071,
subsample=0.16, score=-75.320, total= 1.1min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.3min remaining: 0.0s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 3.3min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=26.955000000000002, learning_rate=0.11850000000000001, max_depth=5,
min_child_weight=0.2561, subsample=0.71000000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:41:32] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=26.955000000000002, learning_rate=0.11850000000000001, max_depth=5,
min_child_weight=0.2561, subsample=0.71000000000000001, score=-98.448, total=
57.1s
```

```
[CV] gamma=26.955000000000002, learning_rate=0.11850000000000001, max_depth=5,
min_child_weight=0.2561, subsample=0.71000000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 57.0s remaining: 0.0s
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:42:29] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=26.955000000000002, learning_rate=0.11850000000000001, max_depth=5,
min_child_weight=0.2561, subsample=0.71000000000000001, score=-98.208, total=
58.3s
```

```
[CV] gamma=26.955000000000002, learning_rate=0.11850000000000001, max_depth=5,
min_child_weight=0.2561, subsample=0.71000000000000001
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.9min remaining: 0.0s
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

[21:43:27] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.  
[CV] gamma=26.955000000000002, learning\_rate=0.11850000000000001, max\_depth=5, min\_child\_weight=0.2561, subsample=0.71000000000000001, score=-100.493, total= 1.0min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 2.9min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 2.9min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits  
[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:44:33] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75, score=-123.154, total= 49.4s  
[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 49.3s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:45:22] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75, score=-120.368, total= 46.7s  
[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 1.6min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:46:09] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=2.1350000000000002, learning\_rate=0.128, max\_depth=4, min\_child\_weight=0.2821, subsample=0.75, score=-123.440, total= 54.5s

```
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   2.5min remaining:   0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   2.5min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:47:10] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32, score=-319.047, total= 1.2min
```

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32
```

```
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.2min remaining:   0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:48:23] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32, score=-323.040, total= 1.0min
```

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32
```

```
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.3min remaining:   0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[21:49:26] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=30.925, learning_rate=0.0345, max_depth=5, min_child_weight=0.4441,
subsample=0.32, score=-317.187, total= 1.0min
```

```
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.3min remaining:   0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.3min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=11.235, learning_rate=0.1125, max_depth=11, min_child_weight=0.4421,
subsample=0.62
```

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:50:33] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=11.235, learning\_rate=0.1125, max\_depth=11, min\_child\_weight=0.4421, subsample=0.62, score=-56.693, total= 3.1min

[CV] gamma=11.235, learning\_rate=0.1125, max\_depth=11, min\_child\_weight=0.4421, subsample=0.62

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 3.1min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:53:41] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=11.235, learning\_rate=0.1125, max\_depth=11, min\_child\_weight=0.4421, subsample=0.62, score=-56.405, total= 2.6min

[CV] gamma=11.235, learning\_rate=0.1125, max\_depth=11, min\_child\_weight=0.4421, subsample=0.62

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 5.8min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[21:56:19] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=11.235, learning\_rate=0.1125, max\_depth=11, min\_child\_weight=0.4421, subsample=0.62, score=-56.825, total= 2.3min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 8.1min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 8.1min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=12.765, learning\_rate=0.2505, max\_depth=9, min\_child\_weight=0.4521, subsample=0.09999999999999999

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[21:58:43] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=12.765, learning_rate=0.2505, max_depth=9, min_child_weight=0.4521,
subsample=0.09999999999999999, score=-63.908, total= 1.6min
[CV]  gamma=12.765, learning_rate=0.2505, max_depth=9, min_child_weight=0.4521,
subsample=0.09999999999999999
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.5min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:00:15] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=12.765, learning_rate=0.2505, max_depth=9, min_child_weight=0.4521,
subsample=0.09999999999999999, score=-63.657, total= 1.2min
[CV]  gamma=12.765, learning_rate=0.2505, max_depth=9, min_child_weight=0.4521,
subsample=0.09999999999999999
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 2.8min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:01:30] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=12.765, learning_rate=0.2505, max_depth=9, min_child_weight=0.4521,
subsample=0.09999999999999999, score=-64.325, total= 1.3min
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.1min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=22.94, learning_rate=0.0475, max_depth=9, min_child_weight=0.1321,
subsample=0.54
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:02:51] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=22.94, learning_rate=0.0475, max_depth=9, min_child_weight=0.1321,
subsample=0.54, score=-101.183, total= 1.6min
[CV]  gamma=22.94, learning_rate=0.0475, max_depth=9, min_child_weight=0.1321,
subsample=0.54
```

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.6min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:04:29] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=22.94, learning\_rate=0.0475, max\_depth=9, min\_child\_weight=0.1321, subsample=0.54, score=-100.002, total= 1.6min

[CV] gamma=22.94, learning\_rate=0.0475, max\_depth=9, min\_child\_weight=0.1321, subsample=0.54

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 3.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:06:04] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=22.94, learning\_rate=0.0475, max\_depth=9, min\_child\_weight=0.1321, subsample=0.54, score=-106.677, total= 1.9min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 5.1min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 5.1min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=9.765, learning\_rate=0.0905, max\_depth=4, min\_child\_weight=0.4121, subsample=0.26

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:08:03] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=9.765, learning\_rate=0.0905, max\_depth=4, min\_child\_weight=0.4121, subsample=0.26, score=-176.891, total= 34.3s

[CV] gamma=9.765, learning\_rate=0.0905, max\_depth=4, min\_child\_weight=0.4121, subsample=0.26

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 34.2s remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[22:08:37] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=9.765, learning_rate=0.0905, max_depth=4, min_child_weight=0.4121,
subsample=0.26, score=-174.499, total= 36.7s
[CV]  gamma=9.765, learning_rate=0.0905, max_depth=4, min_child_weight=0.4121,
subsample=0.26

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.2min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:09:14] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=9.765, learning_rate=0.0905, max_depth=4, min_child_weight=0.4121,
subsample=0.26, score=-168.703, total= 35.5s

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.8min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.8min finished
```

```
Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:09:55] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002, score=-57.813, total=
1.7min
[CV]  gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 1.7min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:11:38] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002, score=-57.562, total=
```

```

3.1min
[CV] gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 4.8min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:14:42] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=6.390000000000001, learning_rate=0.111, max_depth=11,
min_child_weight=0.4131, subsample=0.21000000000000002, score=-58.000, total=
3.5min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.3min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.3min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=20.325, learning_rate=0.061, max_depth=9, min_child_weight=0.3691,
subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:18:21] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=20.325, learning_rate=0.061, max_depth=9, min_child_weight=0.3691,
subsample=0.8200000000000001, score=-80.390, total= 3.0min
[CV] gamma=20.325, learning_rate=0.061, max_depth=9, min_child_weight=0.3691,
subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 3.0min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:21:19] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=20.325, learning_rate=0.061, max_depth=9, min_child_weight=0.3691,
subsample=0.8200000000000001, score=-82.272, total= 3.6min
[CV] gamma=20.325, learning_rate=0.061, max_depth=9, min_child_weight=0.3691,
subsample=0.8200000000000001

```



[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 6.6min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:24:56] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=20.325, learning\_rate=0.061, max\_depth=9, min\_child\_weight=0.3691, subsample=0.8200000000000001, score=-80.765, total= 2.4min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 9.0min remaining: 0.0s

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 9.0min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=13.23, learning\_rate=0.0555, max\_depth=9, min\_child\_weight=0.2741, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:27:22] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=13.23, learning\_rate=0.0555, max\_depth=9, min\_child\_weight=0.2741, subsample=0.8200000000000001, score=-89.867, total= 1.0min

[CV] gamma=13.23, learning\_rate=0.0555, max\_depth=9, min\_child\_weight=0.2741, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.0min remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[22:28:25] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=13.23, learning\_rate=0.0555, max\_depth=9, min\_child\_weight=0.2741, subsample=0.8200000000000001, score=-84.476, total= 1.0min

[CV] gamma=13.23, learning\_rate=0.0555, max\_depth=9, min\_child\_weight=0.2741, subsample=0.8200000000000001

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.1min remaining: 0.0s

C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[22:29:28] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=13.23, learning_rate=0.0555, max_depth=9, min_child_weight=0.2741,
subsample=0.8200000000000001, score=-91.935, total= 1.1min

[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.1min remaining:    0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.1min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:30:36] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001, score=-103.383, total=
1.1min
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.1min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:31:41] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001, score=-107.094, total=
1.1min
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001

[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   2.2min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version
```

```
[22:32:45] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=3.3200000000000003, learning_rate=0.0485, max_depth=9,
min_child_weight=0.1591, subsample=0.8200000000000001, score=-105.632, total=
58.8s
```

```
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.1min remaining:   0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   3.1min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:33:50] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001, score=-56.468, total= 1.1min
```

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done   1 out of   1 | elapsed:   1.1min remaining:   0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:34:55] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001, score=-56.698, total= 3.1min
```

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done   2 out of   2 | elapsed:   4.2min remaining:   0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:38:00] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=15.05, learning_rate=0.1675, max_depth=9, min_child_weight=0.4291,
subsample=0.8200000000000001, score=-56.779, total= 3.3min
```

```
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   7.5min remaining:   0.0s
[Parallel(n_jobs=1)]: Done   3 out of   3 | elapsed:   7.5min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV] gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:41:30] WARNING: src/objective/regression_obj.cu:152: reg:linear is now  
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,  
subsample=0.8200000000000001, score=-204.975, total= 3.5min
```

```
[CV]  gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,  
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 3.5min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:44:59] WARNING: src/objective/regression_obj.cu:152: reg:linear is now  
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,  
subsample=0.8200000000000001, score=-213.991, total= 3.0min
```

```
[CV]  gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,  
subsample=0.8200000000000001
```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 6.5min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:47:58] WARNING: src/objective/regression_obj.cu:152: reg:linear is now  
deprecated in favor of reg:squarederror.
```

```
[CV]  gamma=31.655, learning_rate=0.028, max_depth=9, min_child_weight=0.3381,  
subsample=0.8200000000000001, score=-207.671, total= 2.2min
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.7min remaining: 0.0s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 8.7min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,  
subsample=0.62
```

```
[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:50:22] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,
subsample=0.62, score=-58.754, total= 4.1min
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,
subsample=0.62

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 4.1min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:54:28] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,
subsample=0.62, score=-58.588, total= 3.3min
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,
subsample=0.62

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 7.4min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[22:57:47] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=33.57, learning_rate=0.2155, max_depth=11, min_child_weight=0.0261,
subsample=0.62, score=-58.790, total= 2.4min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 9.8min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 9.8min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=10.135, learning_rate=0.114, max_depth=11,
min_child_weight=0.14709999999999998, subsample=0.62

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:00:15] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=10.135, learning_rate=0.114, max_depth=11,
min_child_weight=0.14709999999999998, subsample=0.62, score=-56.786, total=
1.2min
[CV]  gamma=10.135, learning_rate=0.114, max_depth=11,
min_child_weight=0.14709999999999998, subsample=0.62
```

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:01:28] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=10.135, learning\_rate=0.114, max\_depth=11,  
min\_child\_weight=0.14709999999999998, subsample=0.62, score=-56.456, total=  
1.2min

[CV] gamma=10.135, learning\_rate=0.114, max\_depth=11,  
min\_child\_weight=0.14709999999999998, subsample=0.62

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.4min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:02:39] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=10.135, learning\_rate=0.114, max\_depth=11,  
min\_child\_weight=0.14709999999999998, subsample=0.62, score=-56.484, total=  
1.2min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.6min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.6min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11,  
min\_child\_weight=0.09910000000000001, subsample=0.62

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:03:57] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11,  
min\_child\_weight=0.09910000000000001, subsample=0.62, score=-59.063, total=  
1.2min

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11,  
min\_child\_weight=0.09910000000000001, subsample=0.62

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 1.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:05:10] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11, min\_child\_weight=0.09910000000000001, subsample=0.62, score=-58.707, total=1.2min

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11, min\_child\_weight=0.09910000000000001, subsample=0.62

[Parallel(n\_jobs=1)]: Done 2 out of 2 | elapsed: 2.4min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:06:22] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=28.935000000000002, learning\_rate=0.221, max\_depth=11, min\_child\_weight=0.09910000000000001, subsample=0.62, score=-58.713, total=1.2min

[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.6min remaining: 0.0s  
[Parallel(n\_jobs=1)]: Done 3 out of 3 | elapsed: 3.6min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits

[CV] gamma=13.785, learning\_rate=0.2455, max\_depth=11, min\_child\_weight=0.3361, subsample=0.62

[Parallel(n\_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:07:38] WARNING: src/objective/regression\_obj.cu:152: reg:linear is now deprecated in favor of reg:squarederror.

[CV] gamma=13.785, learning\_rate=0.2455, max\_depth=11, min\_child\_weight=0.3361, subsample=0.62, score=-59.854, total= 3.2min

[CV] gamma=13.785, learning\_rate=0.2455, max\_depth=11, min\_child\_weight=0.3361, subsample=0.62

[Parallel(n\_jobs=1)]: Done 1 out of 1 | elapsed: 3.2min remaining: 0.0s  
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

```
[23:10:49] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=13.785, learning_rate=0.2455, max_depth=11, min_child_weight=0.3361,
subsample=0.62, score=-59.597, total= 3.6min
[CV]  gamma=13.785, learning_rate=0.2455, max_depth=11, min_child_weight=0.3361,
subsample=0.62

[Parallel(n_jobs=1)]: Done    2 out of    2 | elapsed:  6.8min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:14:27] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=13.785, learning_rate=0.2455, max_depth=11, min_child_weight=0.3361,
subsample=0.62, score=-59.882, total= 2.4min

[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  9.2min remaining:    0.0s
[Parallel(n_jobs=1)]: Done    3 out of    3 | elapsed:  9.2min finished
```

Fitting 3 folds for each of 1 candidates, totalling 3 fits

```
[CV]  gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:17:00] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62, score=-303.197, total=
1.8min
[CV]  gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62

[Parallel(n_jobs=1)]: Done    1 out of    1 | elapsed:  1.8min remaining:    0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:18:48] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV]  gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62, score=-304.786, total=
```



```

1.4min
[CV] gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62

[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 3.2min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:20:12] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=36.705, learning_rate=0.0175, max_depth=11,
min_child_weight=0.29009999999999997, subsample=0.62, score=-306.048, total=
1.4min

[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6min remaining: 0.0s
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 4.6min finished

Fitting 3 folds for each of 1 candidates, totalling 3 fits
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6

[Parallel(n_jobs=1)]: Using backend SequentialBackend with 1 concurrent workers.
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:21:41] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6, score=-130.198, total= 36.3s
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6

[Parallel(n_jobs=1)]: Done 1 out of 1 | elapsed: 36.2s remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:

Series.base is deprecated and will be removed in a future version

[23:22:17] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6, score=-129.820, total= 36.2s
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6

```

```
[Parallel(n_jobs=1)]: Done 2 out of 2 | elapsed: 1.2min remaining: 0.0s
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:22:54] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[CV] gamma=38.905, learning_rate=0.12000000000000001, max_depth=4,
min_child_weight=0.2211, subsample=0.6, score=-135.935, total= 44.3s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.9min remaining: 0.0s
```

```
[Parallel(n_jobs=1)]: Done 3 out of 3 | elapsed: 1.9min finished
```

```
C:\ProgramData\Anaconda3\lib\site-packages\xgboost\core.py:587: FutureWarning:
```

Series.base is deprecated and will be removed in a future version

```
[23:23:40] WARNING: src/objective/regression_obj.cu:152: reg:linear is now
deprecated in favor of reg:squarederror.
```

```
[52]: BayesSearchCV(cv=3, error_score='raise',
                    estimator=XGBRegressor(base_score=0.5, booster='gbtree',
                                           colsample_bylevel=1, colsample_bynode=1,
                                           colsample_bytree=1, gamma=0,
                                           importance_type='gain', learning_rate=0.1,
                                           max_delta_step=0, max_depth=3,
                                           min_child_weight=1, missing=None,
                                           n_estimators=100, n_jobs=1, nthread=None,
                                           objective='reg:linear', random_state=123,
                                           reg_alpha...
                    0.23, 0.24, 0.25, 0.26, 0.27, 0.28, 0.29, 0.3 , 0.31, 0.32, 0.33,
                    0.34, 0.35, 0.36, 0.37, 0.38, 0.39, 0.4 , 0.41, 0.42, 0.43, 0.44,
                    0.45, 0.46, 0.47, 0.48, 0.49, 0.5 , 0.51, 0.52, 0.53, 0.54, 0.55,
                    0.56, 0.57, 0.58, 0.59, 0.6 , 0.61, 0.62, 0.63, 0.64, 0.65, 0.66,
                    0.67, 0.68, 0.69, 0.7 , 0.71, 0.72, 0.73, 0.74, 0.75, 0.76, 0.77,
                    0.78, 0.79, 0.8 , 0.81, 0.82, 0.83, 0.84, 0.85, 0.86, 0.87, 0.88,
                    0.89, 0.9 , 0.91, 0.92, 0.93, 0.94, 0.95, 0.96, 0.97, 0.98, 0.99]]},
                    verbose=15)
```

```
[53]: """
import winsound
duration = 1000 # milliseconds
freq = 440 # Hz
winsound.Beep(freq, duration)
"""
```

```
[54]: tuned_XGB.best_estimator_
```

```
[54]: XGBRegressor(base_score=0.5, booster='gbtree', colsample_bylevel=1,
                 colsample_bynode=1, colsample_bytree=1, gamma=10.135,
                 importance_type='gain', learning_rate=0.114, max_delta_step=0,
                 max_depth=11, min_child_weight=0.14709999999999998, missing=None,
                 n_estimators=100, n_jobs=1, nthread=None, objective='reg:linear',
                 random_state=123, reg_alpha=0, reg_lambda=1, scale_pos_weight=1,
                 seed=None, silent=None, subsample=0.62, verbosity=1)
```

```
[55]: training_predictions=tuned_XGB.predict(X_train)
      print("SMAPE score:", smape(y_train, training_predictions))
```

SMAPE score: 12.178154735418948

## 6 Using validation set

```
[56]: validation_predictions=tuned_XGB.predict(X_val)
      print("SMAPE score:", smape(y_val, validation_predictions))
```

SMAPE score: 12.972922585227272

## 7 Using Test set

```
[60]: X=test.copy()
      X.drop(['id', 'date'], axis=1, inplace=True)

      test_predictions=tuned_XGB.predict(X)

[62]: final_test['id']=test['id']
      final_test['sales']=test_predictions
      final_test.head()

      #final_test.to_csv("Submission.csv", index=False)
```

```
[62]:
```

	id	sales
0	0	12.638364
1	1	13.788607
2	2	14.089381
3	3	15.015948
4	4	18.467306

```
[ ]:
```