Gold Price Prediction

Data Exploration

```
# importing necessary libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn import metrics

# loading dataset
df = pd.read_csv("/kaggle/input/gold-price-data/gld_price_data.csv")

# check first 5 rows
df.head()
```

```
       Date          SPX         GLD         USO     SLV   EUR/USD
0  1/2/2008  1447.160034   84.860001   78.470001  15.180  1.471692
1  1/3/2008  1447.160034   85.570000   78.370003  15.285  1.474491
2  1/4/2008  1411.630005   85.129997   77.309998  15.167  1.475492
3  1/7/2008  1416.180054   84.769997   75.500000  15.053  1.468299
4  1/8/2008  1390.189941   86.779999   76.059998  15.590  1.557099
```

```
# check last 5 rows
df.tail()
```

```
           Date          SPX         GLD      USO      SLV   EUR/USD
2285   5/8/2018  2671.919922  124.589996  14.0600  15.5100  1.186789
2286   5/9/2018  2697.790039  124.330002  14.3700  15.5300  1.184722
2287  5/10/2018  2723.070068  125.180000  14.4100  15.7400  1.191753
2288  5/14/2018  2730.129883  124.489998  14.3800  15.5600  1.193118
2289  5/16/2018  2725.780029  122.543800  14.4058  15.4542  1.182033
```

```
# check number of rows and columns
df.shape
```

```
(2290, 6)
```

```
# check product of number of rows and columns
df.size
```

```
13740
```

```
# check columns
df.columns
```

```
Index(['Date', 'SPX', 'GLD', 'USO', 'SLV', 'EUR/USD'], dtype='object')
```

```
# check information of dataset
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2290 entries, 0 to 2289
Data columns (total 6 columns):
 #   Column   Non-Null Count  Dtype  
---  ------   --------------  -----  
 0   Date     2290 non-null   object 
 1   SPX      2290 non-null   float64
 2   GLD      2290 non-null   float64
 3   USO      2290 non-null   float64
 4   SLV      2290 non-null   float64
 5   EUR/USD  2290 non-null   float64
dtypes: float64(5), object(1)
memory usage: 107.5+ KB
```

```
# check duplicate rows
df.duplicated().sum()
```

```
0
```

```
# check descriptive summary of dataset
df.describe()
```

	SPX	GLD	USO	SLV	EUR/USD
count	2290.000000	2290.000000	2290.000000	2290.000000	2290.000000
mean	1654.315776	122.732875	31.842221	20.084997	1.283653
std	519.111540	23.283346	19.523517	7.092566	0.131547
min	676.530029	70.000000	7.960000	8.850000	1.039047
25%	1239.874969	109.725000	14.380000	15.570000	1.171313
50%	1551.434998	120.580002	33.869999	17.268500	1.303297
75%	2073.010070	132.840004	37.827501	22.882500	1.369971
max	2872.870117	184.589996	117.480003	47.259998	1.598798

Random Forest Regression

```
# split data into X and Y
X = df.drop(['Date','GLD'],axis=1)
Y = df['GLD']

# Split dataset into training and testing data
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size =
0.2, random_state=2)

# Load Random Forest Regression Model
regressor = RandomForestRegressor(n_estimators=100)

# Fit data into model
regressor.fit(X_train,Y_train)
```

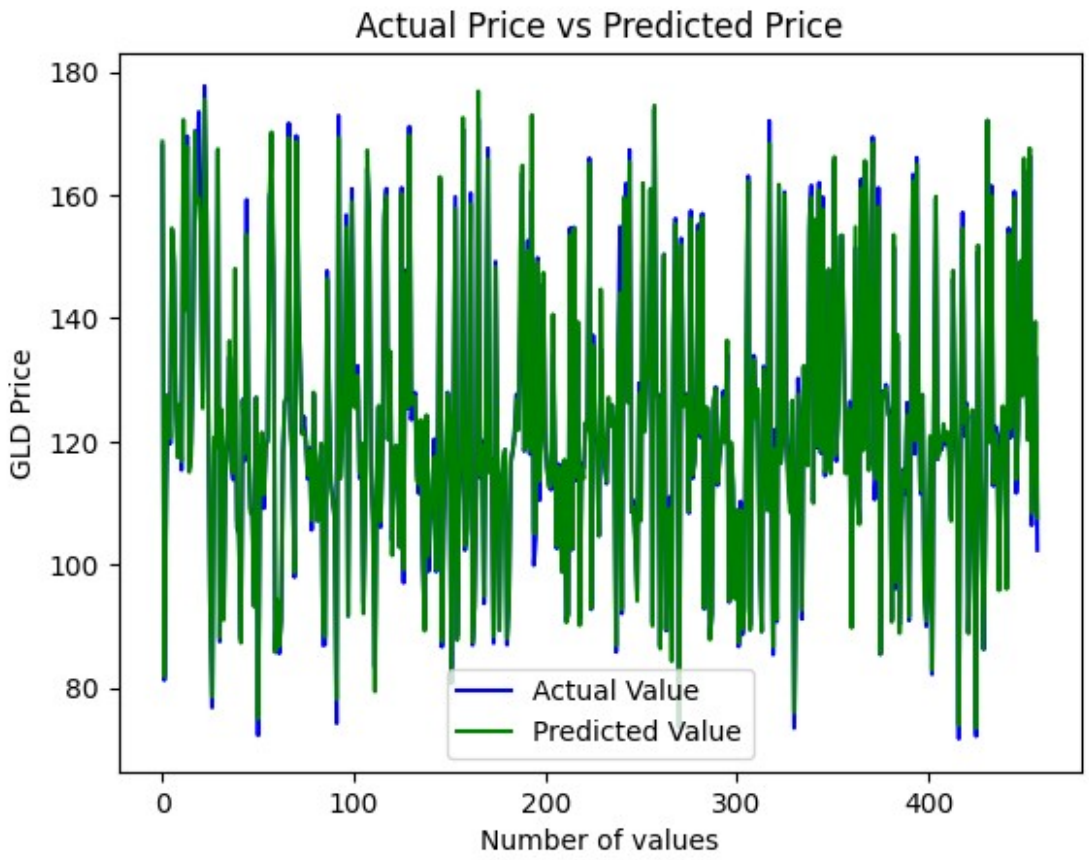
```
RandomForestRegressor()
```

```
# Predict test data
test_data_prediction = regressor.predict(X_test)

# evaluate the model
error_score = metrics.r2_score(Y_test, test_data_prediction)
print("R squared error : ", error_score)
```

```
R squared error :  0.9884407372425769
```

```
# plot actual vs predicted data
plt.plot(list(Y_test), color='blue', label = 'Actual Value')
plt.plot(test_data_prediction, color='green', label='Predicted Value')
plt.title('Actual Price vs Predicted Price')
plt.xlabel('Number of values')
plt.ylabel('GLD Price')
plt.legend()
plt.show()
```


Actual Price vs Predicted Price
GLD Price
Number of values
Actual Value
Predicted Value
180
160
140
120
100
80
0
100
200
300
400