Gold Price Prediction using Random Forest Regressor

In [38]:
```
# Importing required lib
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
```

In [19]:
```
# Reading of Data
df = pd.read_csv('C:/Users/RAJ/Downloads/archive (1)/gld_price_data.csv')
df.head()
```

Out[19]:

	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

Exploratory Data Analysis

In [7]:
```
df.shape
```

Out[7]:
```
(2290, 6)
```

In [24]:
```
df.describe()
```

Out[24]:
```
array([2290.])
```

In [26]:
```
df.isnull().sum()
```

Out[26]:
```
Date       0
SPX        0
GLD        0
USO        0
SLV        0
EUR/USD    0
dtype: int64
```

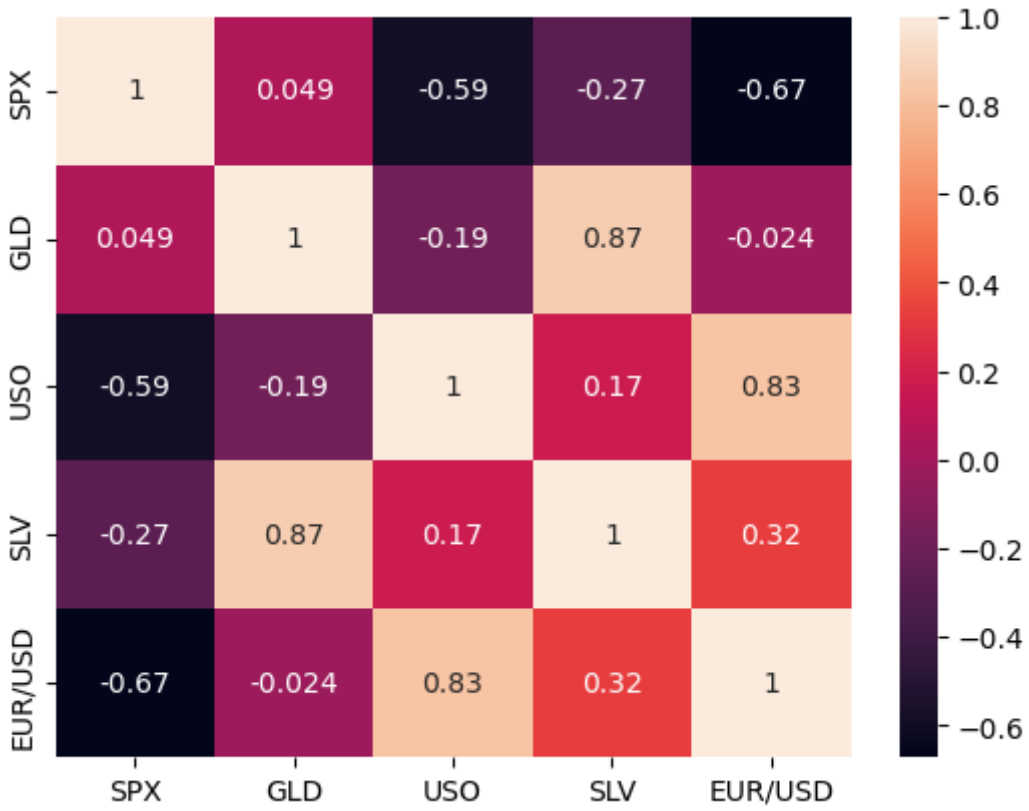
there are no null values in data set

In [55]:
```
# Co relation among variables
correl=df.corr()
correl['GLD']
```

Out[55]:
```
SPX        0.049345
GLD        1.000000
USO       -0.186360
SLV        0.866632
EUR/USD   -0.024375
Name: GLD, dtype: float64
```

In [51]:
```
# HEAT MAP
sns.heatmap(correl,annot=True)
```

Out[51]:
```
<AxesSubplot:>
```



Model Building

In [66]:
```
X = df.drop(['Date','GLD'],axis=1)
y = df['GLD']
```

In [75]:
```
X_train,X_test,y_train,y_test = train_test_split(X,y,random_state=0,train_size=0.7
```

In [84]:
```
from sklearn.ensemble import RandomForestRegressor
RFR = RandomForestRegressor(n_estimators=100)
RFR_model = RFR.fit(X_train,y_train)
```

Out[84]:
```
<bound method RegressorMixin.score of RandomForestRegressor()>
```

In [78]:
```
test_data_prediction = RFR_model.predict(X_test)
print(test_data_prediction)
```

```
[126.91929889 116.73169941 139.66110103 121.76160036  94.8156005
 154.79070087 117.56440094 112.9509015  153.32800025 105.59840074
 103.26509921 120.58000049  92.07709928 158.07220022 121.56099819
 117.16450116  86.33129803  91.98039922  92.95330034 125.78739989
  83.61849953 117.95829908 126.0650986  173.53879628 169.50949659
 139.76830218 114.80369959 160.07170355 133.68020094 116.02730032
 111.40760075 104.76590217 128.27590032 122.12189877  99.04089978
 120.05419968  83.53810076 115.07749987 127.36709872 140.37329847
 107.61540069 131.6442005  108.60489917 133.92099935 133.72529887
 149.70419927 119.3543007  157.67719973 155.91400147 127.64519976
 123.70460041 114.96689871 123.85420093 118.98879974 153.80700023
 121.48579947 112.21310042  86.86229913 156.01680046 118.00950099
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 113.47100015 114.07910145  80.80359915 159.57799928 125.57769991
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 154.6157032  122.02659978 123.36570039 115.23609954  87.83070086
 130.21520026 125.33910074 166.96000037 109.43490015 167.43680041
 103.88579928 138.46479836 115.41400129 119.87450061  94.34830075
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 86.76999905 165.47860344 177.27499763 116.07370057 149.89060112
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 128.58419745 114.13410136 155.26730136 122.80980038  85.82590006
 108.15369983 124.68880196 120.34269887 121.29230119 136.06999878
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  91.97529935 152.24940209 125.95859874 145.0567993  133.60799837
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 126.25470052 120.08030096 113.86719898  91.81030121 173.39220118
 120.26529964 155.09630042  76.35070057 128.3980004   86.48099845
  94.62860073 117.46400035]
```

Accuracy of Model

In [81]:
```
from sklearn import metrics
error_score = metrics.r2_score(y_test,test_data_prediction)
print("The R-squared value is :",error_score)
```

```
The R-squared value is : 0.9873225907806505
```

The model fitted explains 98% of variation. Which is pretty good