In [2]:

```
print("AHMED ALI KHAN")
```

```
AHMED ALI KHAN
```

In [3]:

```
import pandas as pd
import matplotlib.pyplot as plt
import sqlite3
```

In [41]:

```
print("student  marks")
series=pd.Series({'ahmed':90,'ali':89,'NAN':0,'adnan':87,'danyal':85,'abbas':70,'hamad':99,
series
```

```
student  marks
```

Out[41]:

```
ahmed     90
ali       89
NAN        0
adnan     87
danyal    85
abbas     70
hamad     99
hamza     60
dtype: int64
```

In [4]:

```
ds=pd.read_csv(r"C:\Users\BEST BUY\Downloads\BTC 2012-2021\BTC 2012-2021.csv")
ds
```

Out[4]:

	Date	Price	Open	High	Low	Vol.	Change %
0	2021-12-31	46219.5	47123.3	48553.9	45693.6	58.18K	-1.92
1	2021-12-30	47123.3	46470.7	47901.4	46003.0	60.96K	1.42
2	2021-12-29	46461.7	47548.4	48121.7	46127.8	63.92K	-2.28
3	2021-12-28	47545.2	50703.4	50703.8	47345.7	74.39K	-6.18
4	2021-12-27	50678.2	50783.6	52016.3	50459.0	43.90K	-0.20
...	...	...	...	...	...	...	...
3648	2012-01-05	6.9	5.6	7.2	5.6	182.33K	24.78
3649	2012-01-04	5.6	4.9	5.7	4.8	131.17K	14.14
3650	2012-01-03	4.9	5.2	5.3	4.7	125.17K	-6.51
3651	2012-01-02	5.2	5.3	5.5	4.8	69.15K	-0.95
3652	2012-01-01	5.3	4.7	5.5	4.6	108.51K	11.65

3653 rows × 7 columns

In [5]:

```
#DATA TYPE OF DS
ds.dtypes
```

Out[5]:

```
Date          object
Price        float64
Open         float64
High         float64
Low          float64
Vol.          object
Change %     float64
dtype: object
```

In [6]:

```
ds.loc[[4]]
```

Out[6]:

	Date	Price	Open	High	Low	Vol.	Change %
4	2021-12-27	50678.2	50783.6	52016.3	50459.0	43.90K	-0.2

In [7]:

```
data_loc=ds.loc[2021-12-31:2021-12-27]
data_loc
```

Out[7]:

	Date	Price	Open	High	Low	Vol.	Change %
1978	2016-08-01	607.0	621.9	627.9	603.5	66.66K	-2.39
1979	2016-07-31	621.9	654.7	654.9	621.4	62.89K	-5.02
1980	2016-07-30	654.7	655.4	657.5	652.1	19.35K	-0.11
1981	2016-07-29	655.4	654.1	657.4	651.0	27.04K	0.20
1982	2016-07-28	654.1	654.5	658.0	650.8	28.11K	-0.06

In [8]:

```
Data_iloc =ds.iloc[22:28]
Data_iloc
```

Out[8]:

	Date	Price	Open	High	Low	Vol.	Change %
22	2021-12-09	47596.6	50477.6	50790.2	47341.9	58.69K	-5.70
23	2021-12-08	50473.9	50596.6	51204.7	48700.7	55.59K	-0.24
24	2021-12-07	50595.2	50547.4	51918.6	50070.9	56.29K	0.07
25	2021-12-06	50562.1	49412.1	50913.3	47237.9	89.68K	2.34
26	2021-12-05	49405.5	49196.4	49689.3	47797.8	72.03K	0.43
27	2021-12-04	49195.2	53620.7	53847.2	42587.8	168.00K	-8.27

In [9]:

```
ds.corr()
```

Out[9]:

	Price	Open	High	Low	Change %
Price	1.000000	0.998946	0.999541	0.999434	-0.006382
Open	0.998946	1.000000	0.999564	0.999136	-0.019741
High	0.999541	0.999564	1.000000	0.999089	-0.012626
Low	0.999434	0.999136	0.999089	1.000000	-0.011388
Change %	-0.006382	-0.019741	-0.012626	-0.011388	1.000000

In [10]:

```
ds.head(3)
```

Out[10]:

	Date	Price	Open	High	Low	Vol.	Change %
0	2021-12-31	46219.5	47123.3	48553.9	45693.6	58.18K	-1.92
1	2021-12-30	47123.3	46470.7	47901.4	46003.0	60.96K	1.42
2	2021-12-29	46461.7	47548.4	48121.7	46127.8	63.92K	-2.28

In [11]:

```
ds.tail(6)
```

Out[11]:

	Date	Price	Open	High	Low	Vol.	Change %
3647	2012-01-06	6.7	6.9	7.2	6.1	218.08K	-3.60
3648	2012-01-05	6.9	5.6	7.2	5.6	182.33K	24.78
3649	2012-01-04	5.6	4.9	5.7	4.8	131.17K	14.14
3650	2012-01-03	4.9	5.2	5.3	4.7	125.17K	-6.51
3651	2012-01-02	5.2	5.3	5.5	4.8	69.15K	-0.95
3652	2012-01-01	5.3	4.7	5.5	4.6	108.51K	11.65

In [33]:

```
ds.shape
```

Out[33]:

```
(3653, 7)
```

In [32]:

```
data_duplicate = ds.append(ds)
data_duplicate.shape
```

Out[32]:

```
(7306, 7)
```

In [35]:

```
data_duplicate_drop=ds.drop_duplicates()
data_duplicate_drop.shape
```

Out[35]:

```
(3653, 7)
```

In [43]:

```
ds['price'].mean()
```

Out[43]:

```
7896.499397755267
```

In [13]:

```
pd.DataFrame.info(ds)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3653 entries, 0 to 3652
Data columns (total 7 columns):
 #   Column    Non-Null Count  Dtype  
---  ------    --------------  -----  
 0   Date      3653 non-null   object 
 1   Price     3653 non-null   float64
 2   Open      3653 non-null   float64
 3   High      3653 non-null   float64
 4   Low       3653 non-null   float64
 5   Vol.      3653 non-null   object 
 6   Change %  3653 non-null   float64
dtypes: float64(5), object(2)
memory usage: 199.9+ KB
```

In [14]:

```
ds.describe()
```

Out[14]:

	Price	Open	High	Low	Change %
count	3653.000000	3653.000000	3653.000000	3653.000000	3653.000000
mean	7896.499398	7883.910840	8112.471913	7629.652012	0.430088
std	14202.410636	14188.954496	14592.533286	13729.509135	7.586477
min	4.200000	4.200000	4.400000	3.900000	-57.210000
25%	268.600000	268.600000	277.100000	260.200000	-1.260000
50%	944.200000	943.500000	974.500000	912.700000	0.150000
75%	8630.200000	8628.600000	8807.700000	8309.600000	2.000000
max	67527.900000	67528.700000	68990.600000	66334.900000	336.840000

In [15]:

```
ds.isnull()
```

Out[15]:

	Date	Price	Open	High	Low	Vol.	Change %
0	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...
3648	False	False	False	False	False	False	False
3649	False	False	False	False	False	False	False
3650	False	False	False	False	False	False	False
3651	False	False	False	False	False	False	False

In [16]:

```
ds.isnull().sum()
```

Out[16]:

```
Date        0
Price       0
Open        0
High        0
Low         0
Vol.        0
Change %    0
dtype: int64
```

In [17]:

```
ds.columns = [col.lower() for col in ds]
ds.columns
```

Out[17]:

```
Index(['date', 'price', 'open', 'high', 'low', 'vol.', 'change %'], dtype='o
bject')
```

In [18]:

```
data = ds['change %']
data.head(7)
```

Out[18]:

```
0   -1.92
1    1.42
2   -2.28
3   -6.18
4   -0.20
5    0.74
6   -0.75
Name: change %, dtype: float64
```

In [19]:

```
ds['price'].describe()
```

Out[19]:

```
count     3653.000000
mean      7896.499398
std      14202.410636
min          4.200000
25%        268.600000
50%        944.200000
75%       8630.200000
max      67527.900000
Name: price, dtype: float64
```

In [20]:

```
ds['high'].value_counts().head(6)
```

Out[20]:

```
5.1     21
5.0     21
5.2     20
4.9     20
13.6    13
11.8    12
Name: high, dtype: int64
```

In [21]:

```
subset=ds[['price','vol.','change %']]
subset.head(5)
```

Out[21]:

	price	vol.	change %
0	46219.5	58.18K	-1.92
1	47123.3	60.96K	1.42
2	46461.7	63.92K	-2.28
3	47545.2	74.39K	-6.18
4	50678.2	43.90K	-0.20

In [22]:

```
isin=ds[ds['date'].isin(['2021-12-30', '2012-01-02'])].head()
isin
```

Out[22]:

	date	price	open	high	low	vol.	change %
1	2021-12-30	47123.3	46470.7	47901.4	46003.0	60.96K	1.42
3651	2012-01-02	5.2	5.3	5.5	4.8	69.15K	-0.95

In [23]:

```
condition=ds[ds['vol.'] == "60.96K"].head(10)
condition
```

Out[23]:

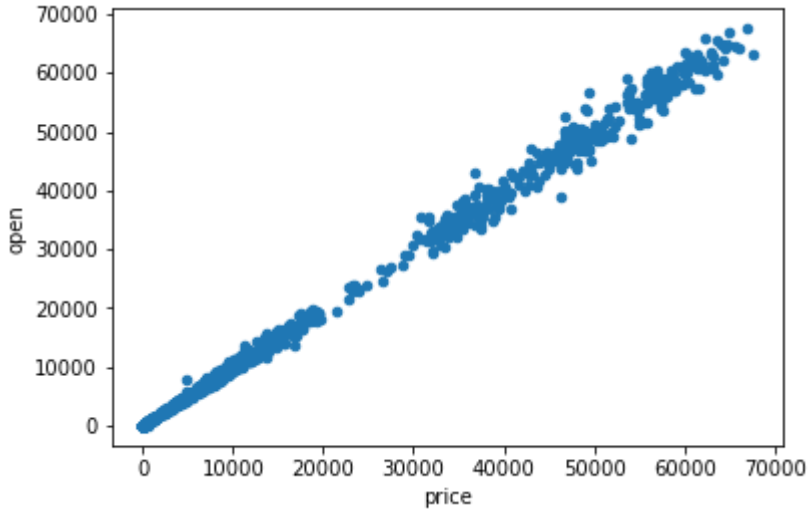
	date	price	open	high	low	vol.	change %
1	2021-12-30	47123.3	46470.7	47901.4	46003.0	60.96K	1.42
3190	2013-04-07	162.3	142.6	164.9	142.6	60.96K	13.79

In [24]:

```
ds.plot(kind='scatter', x='price', y='open', )
```

Out[24]:

```
<AxesSubplot:xlabel='price', ylabel='open'>
```

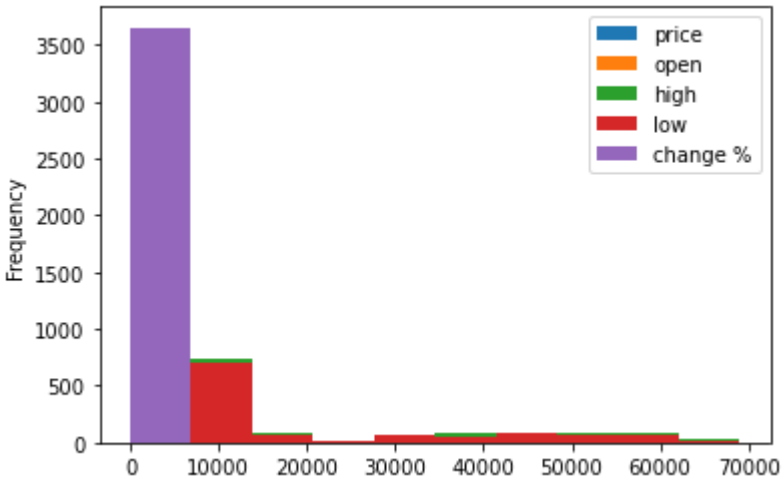


In [25]:

```
ds.plot(kind='hist')
```

Out[25]:

```
<AxesSubplot:ylabel='Frequency'>
```



In [26]:

```
ds.plot(kind='box')
```

Out[26]:

<AxesSubplot:>