0-dataVisualiz

2024 年 1 月 31 日

1 数据预处理与可视化

[1]:
```
import numpy as np
import mglearn
import matplotlib.pyplot as plt
import pandas as pd
%matplotlib inline
```

1.1 导入数据集

[2]:
```
db_bitcoin = pd.read_csv("database\BCHAIN-MKPRU.csv")
db_gold = pd.read_csv("database\LBMA-GOLD.csv")
date_bitcoin, value_bitcoin = db_bitcoin.values[:, 0], db_bitcoin.values[:, 1]
date_gold, value_gold = db_gold.values[:, 0], db_gold.values[:, 1]

# gold 有缺失值，因为 gold 不是每天都能交易
mask = np.isin(date_bitcoin, date_gold)
date_gold_new = date_bitcoin
value_gold_new = np.zeros_like(value_bitcoin)
ind_gold = 0
for i in range(0, len(mask)):
    if mask[i] == False:
        value_gold_new[i] = value_gold_new[i - 1]
    else:
        if np.isnan(value_gold[ind_gold]):
            value_gold_new[i] = value_gold_new[i - 1]
        else:
```

```
            value_gold_new[i] = value_gold[ind_gold]
        ind_gold += 1

value_gold_new[0] = value_gold_new[1]
date_gold = date_gold_new
value_gold = value_gold_new
```

1.2 获得动态平均值

日期为 d 的动态平均值为 $\frac{1}{period}\sum_{d-period+1}^{d} value_i$

动态平均值更能反映趋势走向

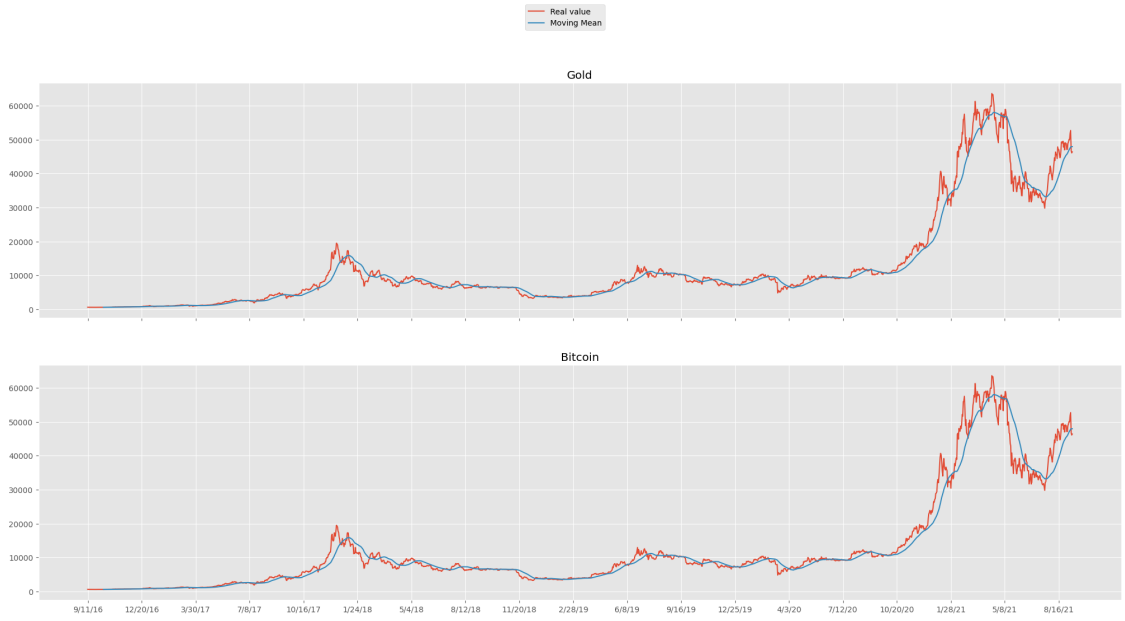
[3]:
```
period = 30
meanvalue_bitcoin = np.convolve(value_bitcoin, np.ones(period)/ period,␣
 ↪mode="valid")
meanvalue_gold = np.convolve(value_gold, np.ones(period)/ period, mode="valid")
```

1.3 画图

[4]:
```
plt.style.use('ggplot')
fig, ax = plt.subplots(2, 1, sharex='all')
fig.set_size_inches((25, 12))
# gold
ax[0].plot(date_bitcoin, value_bitcoin)
ax[0].plot(date_bitcoin[period - 1 ::], meanvalue_bitcoin)
ax[0].set_xticks(date_gold[0::100])
ax[0].set_title('Gold')
# bitcoin
ax[1].plot(date_bitcoin, value_bitcoin)
ax[1].plot(date_bitcoin[period - 1 ::], meanvalue_bitcoin)
ax[1].set_title('Bitcoin')

fig.legend(['Real value', 'Moving Mean'], loc='upper center')
```

[4]:
```
<matplotlib.legend.Legend at 0x23909d0b8d0>
```



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2 数据预测示例

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3 量化参数可视化

3.1 走势

3.1.1 预测值

3.1.2 动量

[5]:
```
momentum_bitcoin = np.diff(np.diff(value_bitcoin))
momentum_gold = np.diff(np.diff(value_gold))
# draw momentum
plt.style.use('ggplot')
fig, ax = plt.subplots(2, 1, sharex='all')
```

```
fig.set_size_inches((25, 12))
fig.suptitle('Momentum Figure')
# gold
ax[0].plot(date_bitcoin, value_bitcoin)
ax[0].set_xticks(date_gold[0::100])
ax[0].set_title('Gold')
# bitcoin
ax[1].plot(date_bitcoin, value_bitcoin)
ax[1].set_title('Bitcoin')
```

[5]: Text(0.5, 1.0, 'Bitcoin')