

1. 미국금리 데이터 추출 + 저장

```
import json
import requests
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import matplotlib.ticker as mticker
import boundary_value_analysis
from matplotlib import font_manager as fm, rc

font = fm.FontProperties(fname='C:\Windows\Fonts\malgun.ttf').get_name()
rc('font', family=font)

# 미국금리 데이터 추출 + 저장
URL = "https://ecos.bok.or.kr/api/StatisticSearch/1A1RCZIVM0QTVI2MN2W0/json/kr/1/65/902Y001/M/201802/202302/1030401"
response = requests.get(URL)
json_result = json.loads(response.text)

USA_rate = []
for item in json_result['StatisticSearch']['row']:
    # 날짜에 "-" 추가
    USA_interest_time = item['TIME'][:4] + "-" + item['TIME'][4:6]
    # 사용자 지정함수사용
    USA_interest = boundary_value_analysis.boundary_value(float(item['DATA_VALUE']))

    USA_rate.append({"TIME": USA_interest_time, "Data_value": USA_interest})

# 파일 저장
with open('USA_interest_rate.json', 'w') as f:
    json.dump(USA_rate, f)
```

```
{
  "StatisticSearch": {
    "list_total_count": 60,
    "row": [
      {
        "STAT_CODE": "902Y001",
        "STAT_NAME": "9.1.6.1. 주요국제금리",
        "ITEM_CODE1": "1030401",
        "ITEM_NAME1": "U$ LIBOR(3M)",
        "ITEM_CODE2": null,
        "ITEM_NAME2": null,
        "ITEM_CODE3": null,
        "ITEM_NAME3": null,
        "ITEM_CODE4": null,
        "ITEM_NAME4": null,
        "UNIT_NAME": "연%",
        "TIME": "201802",
        "DATA_VALUE": "2.01719"
      }
    ]
  }
}
```

```
[{'TIME': '2018-02', 'Data_value': 1.95},
 {'TIME': '2018-03', 'Data_value': 2.25},
 {'TIME': '2018-04', 'Data_value': 2.25},
 {'TIME': '2018-05', 'Data_value': 2.25},
 {'TIME': '2018-06', 'Data_value': 2.25},
 {'TIME': '2018-07', 'Data_value': 2.25},
 {'TIME': '2018-08', 'Data_value': 2.25},
 {'TIME': '2018-09', 'Data_value': 2.25},
 {'TIME': '2018-10', 'Data_value': 2.55},
 {'TIME': '2018-11', 'Data_value': 2.85},
 {'TIME': '2018-12', 'Data_value': 2.85},
 {'TIME': '2019-01', 'Data_value': 2.85},
 {'TIME': '2019-02', 'Data_value': 2.55},
 {'TIME': '2019-03', 'Data_value': 2.55},
 {'TIME': '2019-04', 'Data_value': 2.55},
 {'TIME': '2019-05', 'Data_value': 2.55}]
```

2. 그래프에 사용할 데이터 처리

```
#데이터 로드
with open('USA_interest_rate.json', 'r') as f:
    USA_rate = json.load(f)

# 그래프 데이터처리
USA_interest_time_list = [t['TIME'] for t in USA_rate]
USA_interest_list = [d['Data_value'] for d in USA_rate]

with open('Kor_exchange_rate.json', 'r') as f:
    One_dollar = json.load(f)

Exchange_time_list = [t['TIME'] for t in One_dollar]
Exchange_list = [d['Data_value'] for d in One_dollar]

with open('Kor_interest_rate.json', 'r') as f:
    Kor_rate = json.load(f)

Kor_interest_time_list = [t['TIME'] for t in Kor_rate]
Kor_interest_list = [d['Data_value'] for d in Kor_rate]
```

```
[{'TIME': '2018-02', 'Data_value': 1.95},
 {'TIME': '2018-03', 'Data_value': 2.25},
 {'TIME': '2018-04', 'Data_value': 2.25},
 {'TIME': '2018-05', 'Data_value': 2.25},
 {'TIME': '2018-06', 'Data_value': 2.25},
 {'TIME': '2018-07', 'Data_value': 2.25},
 {'TIME': '2018-08', 'Data_value': 2.25},
 {'TIME': '2018-09', 'Data_value': 2.25},
 {'TIME': '2018-10', 'Data_value': 2.55},
 {'TIME': '2018-11', 'Data_value': 2.85},
 {'TIME': '2018-12', 'Data_value': 2.85},
 {'TIME': '2019-01', 'Data_value': 2.85},
 {'TIME': '2019-02', 'Data_value': 2.55},
 {'TIME': '2019-03', 'Data_value': 2.55},
 {'TIME': '2019-04', 'Data_value': 2.55},
 {'TIME': '2019-05', 'Data_value': 2.55},
```

USA_interest_time_list USA_interest_list

'2018-02',	1.95,
'2018-03',	2.25,
'2018-04',	2.25,
'2018-05',	2.25,
'2018-06',	2.25,
'2018-07',	2.25,
'2018-08',	2.25,
'2018-09',	2.25,
'2018-10',	2.55,
'2018-11',	2.85,
'2018-12',	2.85,
'2019-01',	2.85,
'2019-02',	2.55,
'2019-03',	2.55,
'2019-04',	2.55,
'2019-05',	2.55,

3. 그래프 그리기

```
# 그래프 그리기
fig, ax = plt.subplots(figsize=(16,9))

# USA_interest 그래프 그리기
lns1 = ax.plot(USA_interest_time_list, USA_interest_list, 'r', label='USA_interest_rate')

# Kor_interest 그래프 그리기
lns2 = ax.plot(Kor_interest_time_list, Kor_interest_list, 'g', label='Kor_interest_rate')

# USA_interest 그래프와 y축 공유하기
ax2 = ax.twinx()

# Kor_exchange 그래프 그리기
lns3 = ax2.plot(Exchange_time_list, Exchange_list, label='Kor_exchange_rate')

# y축 레이블, 타이틀 설정
ax.set_ylabel('금리', fontsize = 15)
ax.set_title('미국 금리에 따른 환율, 기준금리변화', fontsize = 15)
ax2.set_ylabel('환율', fontsize = 15)

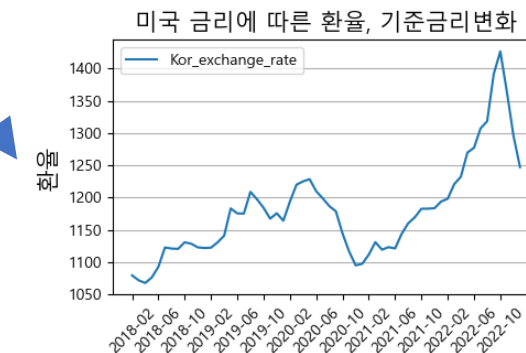
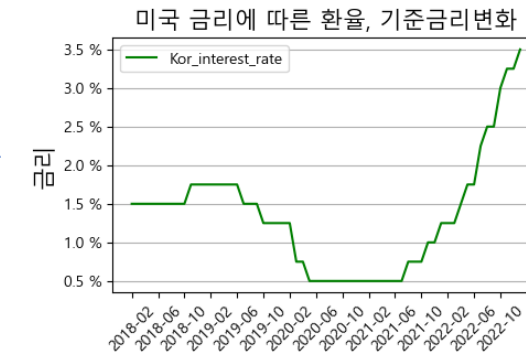
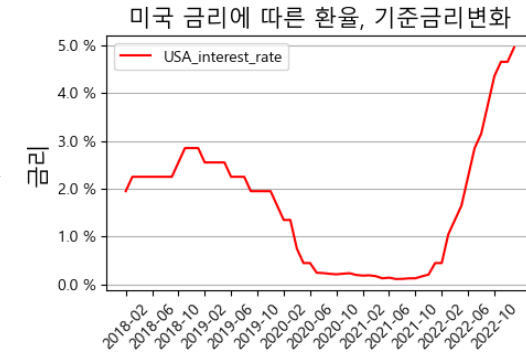
arr = len(USA_interest_list)
ax.set_xticks(np.arange(0, arr, 4))

# 범례 합치기
lns = lns1+lns2+lns3
labs = [l.get_label() for l in lns]
ax.legend(lns, labs, loc=0)

# %기호 넣기
ax.yaxis.set_major_formatter(mticker.FormatStrFormatter('%.1f %'))

# x축 눈금 기울이기
plt.setp(ax.get_xticklabels(), rotation=45)

ax.grid(True, axis = 'y')
plt.show()
```



미국 금리에 따른 환율, 기준금리변화

