Currency over Time

Project 1

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Intro- David

Currency Exchange

Currency foreign exchange determines value of foreign investments, also it is an indicator of the relative level of economic health of one country and its people. Due to the special role this play in the country's trade level. Volatile and high exchange rate discourages foreign investment, stable and low exchange rate encourages them.

Our group selected the US dollar, Japanese yen, Great British pound, and Chinese Yuan, to determine fluctuations among them for the period 2005-2015, and explore relationships between currency exchange and traveling, and its effects over GDP and GDP over Unemployment.

Fluctuations effects, initial questions:

-Do fluctuations from one dominant currency affect simultaneously other related currencies? What causes these fluctuations?

-Do fluctuations in dollar currency have a traveling effect to and from the US?

Other effects questions:

-Does Travel/Tourism have an positive impact in relation to GDP?

-Is unemployment inversely proportional to GDP?

Code & Data Sets Used- Marvin

Analyses:

- Volatility of currency over time
- Correlation between currency rates and travel to & from the United States
- Correlation between tourism spending and GDP in the United States
- Correlation between GDP and unemployment

Data:

- Forex currency exchange data (monthly, pulled using an api)
- Travel data and import/export data from the NTTO (monthly, csv)
- GDP data from the World Bank (yearly, excel)
- Unemployment data from the BLS (monthly, excel)

```
# set dependencies
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.ticker as mtick
import requests
import re as re
```

Data Cleaning Process- Marvin

Our data sets were fortunately fairly clean when pulled and mostly only required some basic manual extraction of the dates and countries we wished to look at or simple data type conversion. The forex data did, however, require some cleaning using regular expressions in pandas to isolate the month and year as well as separating the currency symbol from the value.

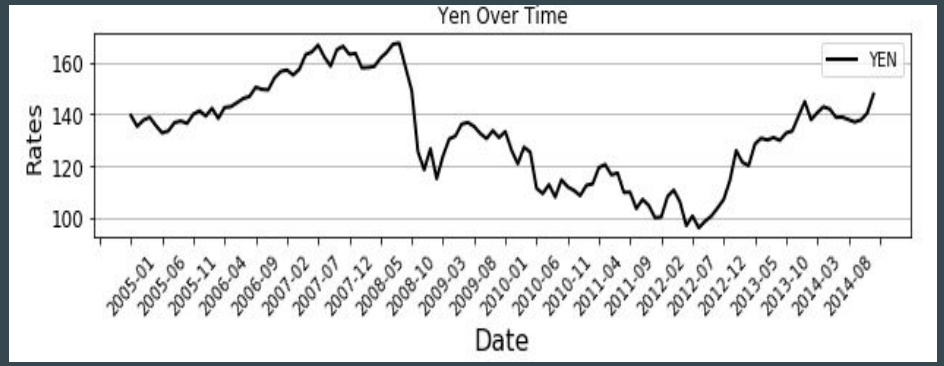
```
# pull FOREX data from fixer site
api_key = "27279b812fe4f25f2c43584f1be9bdb9"

base = {"Date": ["NA"], "Rate": ["NA"]}
df = pd.DataFrame(base)

months = ["01", "02", "03", "04", "05", "06", "07", "08", "09", "10", "11", "12"]
countries = ["USD", "GBP", "JPY", "CNY"]
# countries = ["XAU"]

for i in months:
    for j in range(2005, 2015):
        for c in countries:
            url = f"http://data.fixer.io/api/{j}-{i}-01?access_key={api_key}&base=EUR&symbols={c}"

            curr = requests.get(url)
            curr_js = curr.json()

            date = curr_js["date"]

            rate = curr_js["rates"]

            d = {"Date": [date], "Rate": [rate]}
            df2 = pd.DataFrame(d)

            df = df.append(df2)
```

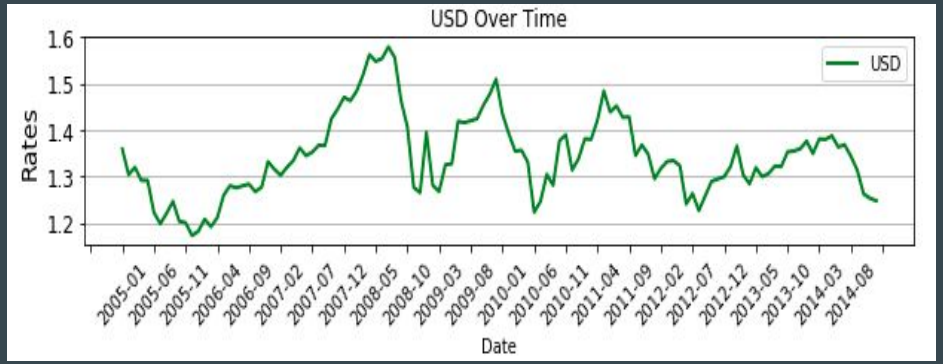
```
print(curr_js)
```

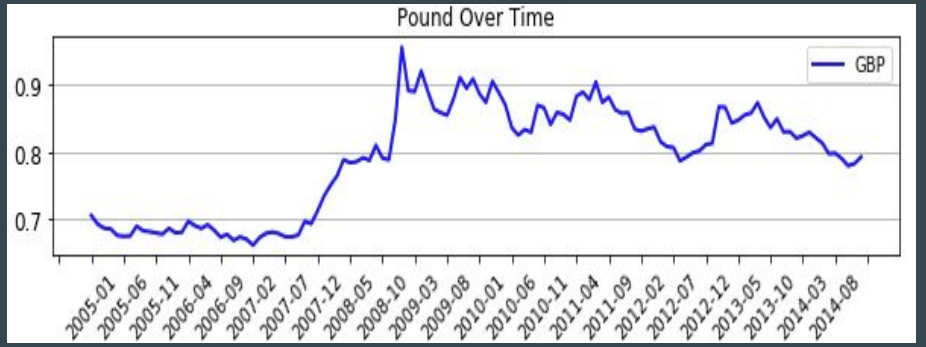
```
{'success': True, 'timestamp': 1104623999, 'historical': True, 'base': 'EUR', 'date': '2005-01-01', 'rates': {'USD': 1.358363}}
```

```
# pull the currency and rate information
df['Currency'] = df['Rate'].str.extract('([A-Z][A-Z][A-Z])', expand=True)
df['Rate_c'] = df['Rate'].str.extract('([0-9]+[.][0-9]+)', expand=True)
```

Currency fluctuation over time (YEN, USD, CNY, GBP)- Jean



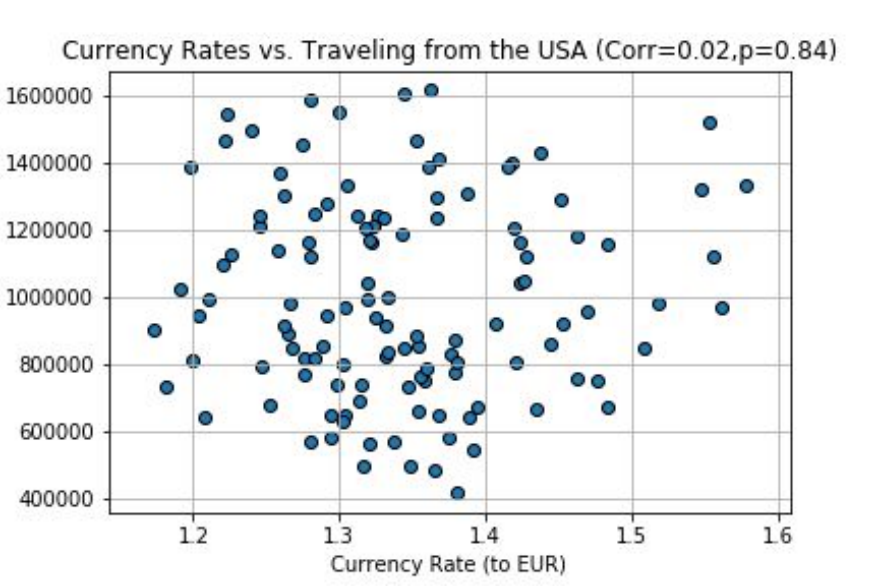




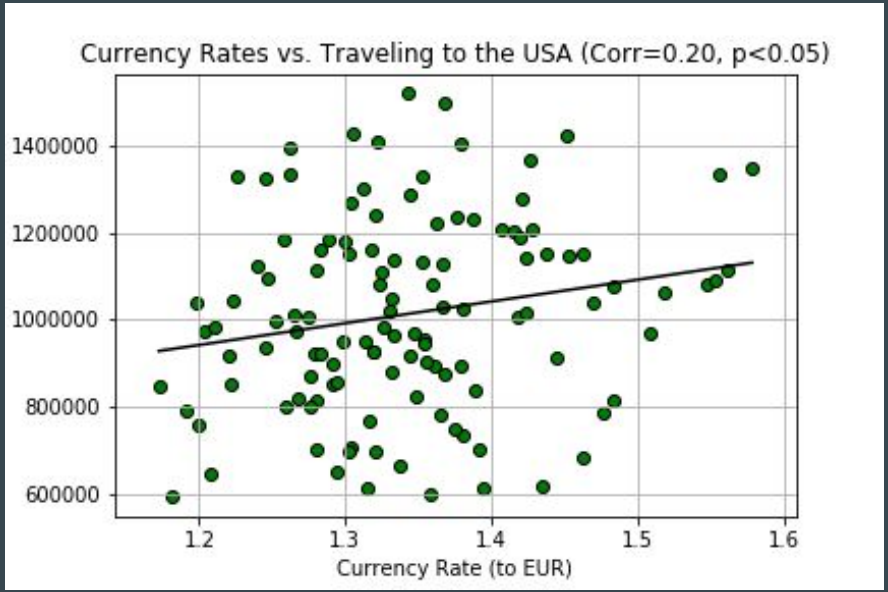
Matpoltlib line graph using CSV data

Travel Departures from the US

-Lulu

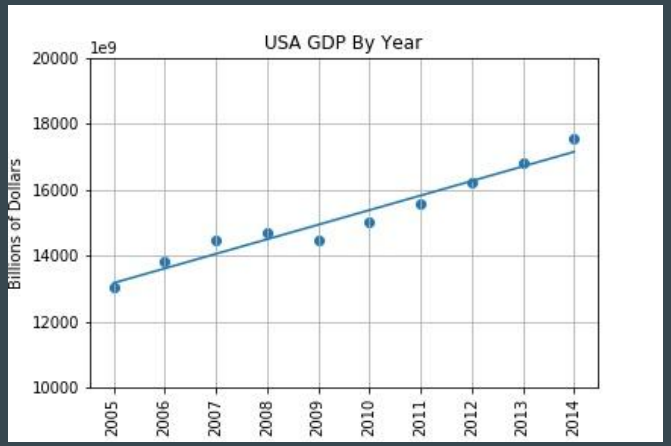


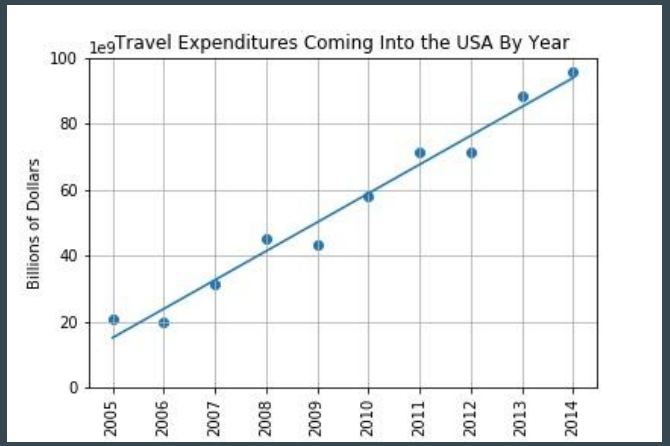
Travel Arrivals to the US

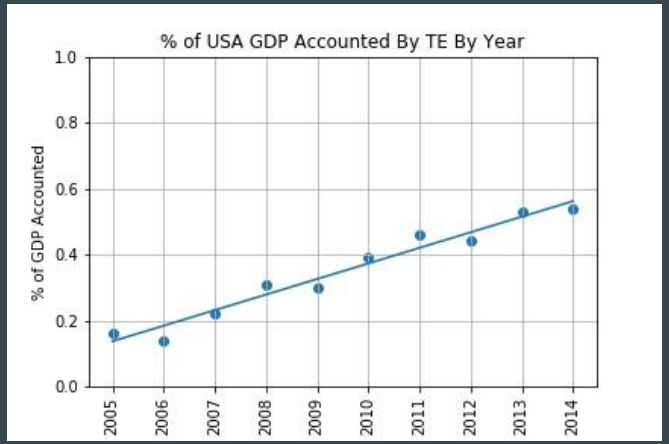


Matpoltlib scatter plotting using CSV data

GDP and Travel Expenditure- Marvin

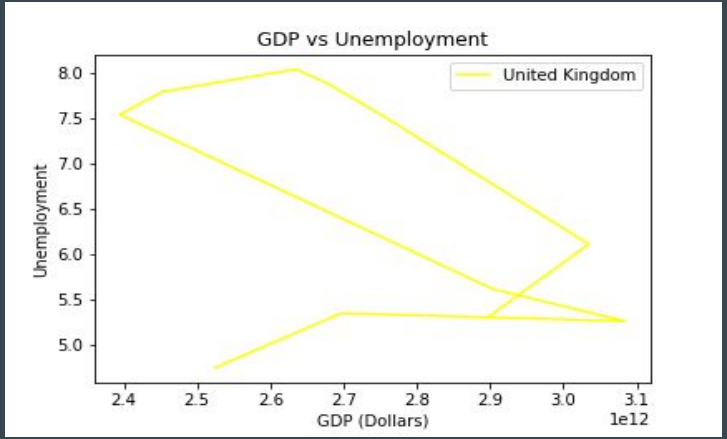


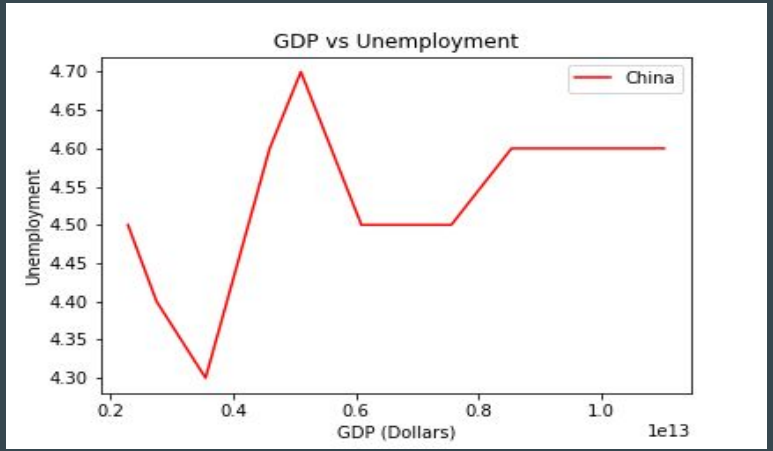


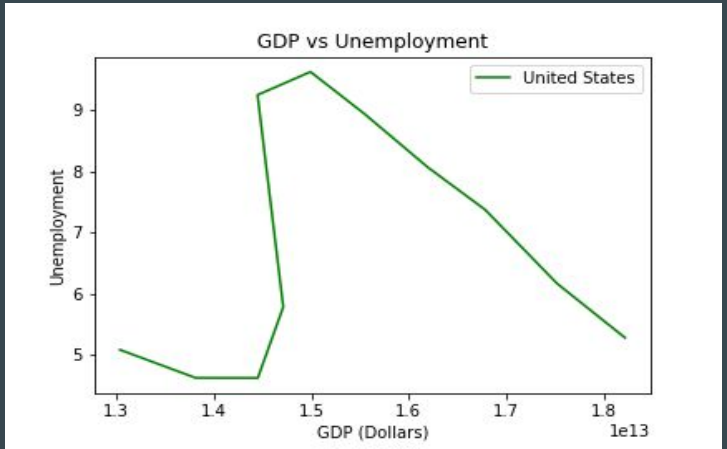


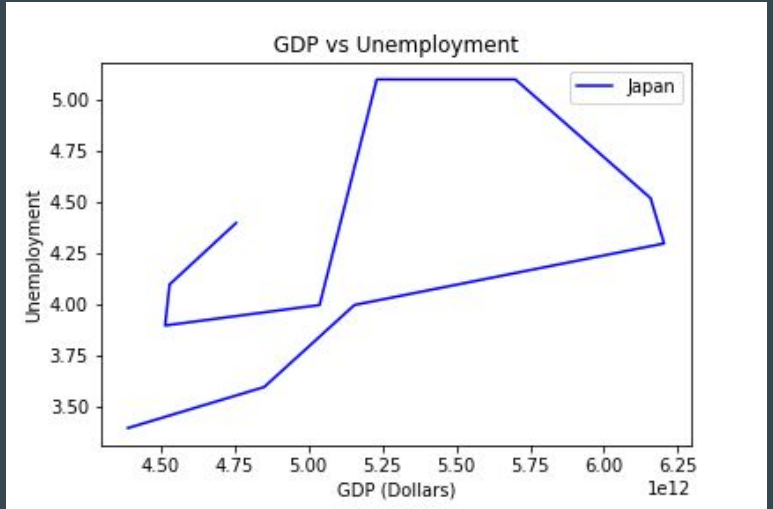
Matpoltlib using CSV and excel data

GDP and Unemployment- Elvis









Matpoltlib using CSV data

Our Sources

- https://fixer.io/ - Currency rates
- https://travel.trade.gov/research/monthly/arrivals/index.asp - Arrivals and Departures in/outside the US
- https://travel.trade.gov/outreachpages/inbound.general_information.inbound_overview.asp - Travel Imports/Exports in the US
- https://data.worldbank.org/indicator/NY.GDP.MKTP.CD - GDP
- https://datacatalog.worldbank.org/dataset/world-development-indicators - GDP
- https://data.bls.gov/pdq/SurveyOutputServlet - Unemployment rates in the US