시각화 (Visualization) 과제

In [1]:

```
!pip install pandas
```

```
Requirement already satisfied: pandas in c:₩users₩이준용₩.conda₩envs₩data_mining₩lib
₩site-packages (1.1.3)
Requirement already satisfied: pytz>=2017.2 in c:₩users₩이준용₩.conda₩envs₩data_mini
ng₩lib₩site-packages (from pandas) (2020.1)
Requirement already satisfied: python-dateutil>=2.7.3 in c:₩users₩이준용₩.conda₩envs
₩data_mining₩lib₩site-packages (from pandas) (2.8.1)
Requirement already satisfied: numpy>=1.15.4 in c:₩users₩이준용₩.conda₩envs₩data_min
ing₩lib₩site-packages (from pandas) (1.19.2)
Requirement already satisfied: six>=1.5 in c:₩users₩이준용₩.conda₩envs₩data_mining₩l
ib₩site-packages (from python-dateutil>=2.7.3->pandas) (1.15.0)
```

In [2]:

```
!pip install matplotlib
```

```
Requirement already satisfied: matplotlib in c:₩users₩이준용₩.conda₩envs₩data_mining
₩lib₩site-packages (3.3.2)
Requirement already satisfied: pillow>=6.2.0 in c:₩users₩이준용₩.conda₩envs₩data_min
ing₩lib₩site-packages (from matplotlib) (8.0.1)
Requirement already satisfied: cycler>=0.10 in c:₩users₩이준용₩.conda₩envs₩data_mini
ng₩lib₩site-packages (from matplotlib) (0.10.0)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in c:₩users
₩이준용₩.conda₩envs₩data_mining₩lib₩site-packages (from matplotlib) (2.4.7)
Requirement already satisfied: python-dateutil>=2.1 in c:₩users₩이준용₩.conda₩envs₩d
ata_mining₩lib₩site-packages (from matplotlib) (2.8.1)
Requirement already satisfied: certifi>=2020.06.20 in c:₩users₩이준용₩.conda₩envs₩da
ta_mining₩lib₩site-packages (from matplotlib) (2020.6.20)
Requirement already satisfied: numpy>=1.15 in c:₩users₩이준용₩.conda₩envs₩data_minin
g₩lib₩site-packages (from matplotlib) (1.19.2)
Requirement already satisfied: kiwisolver>=1.0.1 in c:₩users₩이준용₩.conda₩envs₩data
_mining₩lib₩site-packages (from matplotlib) (1.3.0)
Requirement already satisfied: six in c:₩users₩이준용₩.conda₩envs₩data_mining₩lib₩si
te-packages (from cycler>=0.10->matplotlib) (1.15.0)
```

다음 블로그에 있는 시각화 예시와 데이터셋을 이용해서 시각화를 구현해본다.

https://towardsdatascience.com/10-viz-every-ds-should-know-4e4118f26fc3
(https://towardsdatascience.com/10-viz-every-ds-should-know-4e4118f26fc3)

In [3]:

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

1. 히스토그램 (Histograms)

1) 데이터 읽기

In [4]:

```
dataset_path = "data/thermostat_rebates_by_zip_1000.csv"
dataset = pd.read_csv(dataset_path)

dataset.tail()
```

Out[4]:

	zip-code	rebate-usd	lat	lng	median-household-income	mean-household-income	population
995	40385	100	37.758499	-84.132959	43280	51428	3131
996	72433	100	36.030397	-91.049037	31934	36651	3067
997	90014	67	34.043478	-118.251931	13832	30121	7005
998	8021	90	39.807377	-75.002697	55858	63779	45515
999	68067	100	42.152506	-96.471658	39062	51461	1397

In [5]:

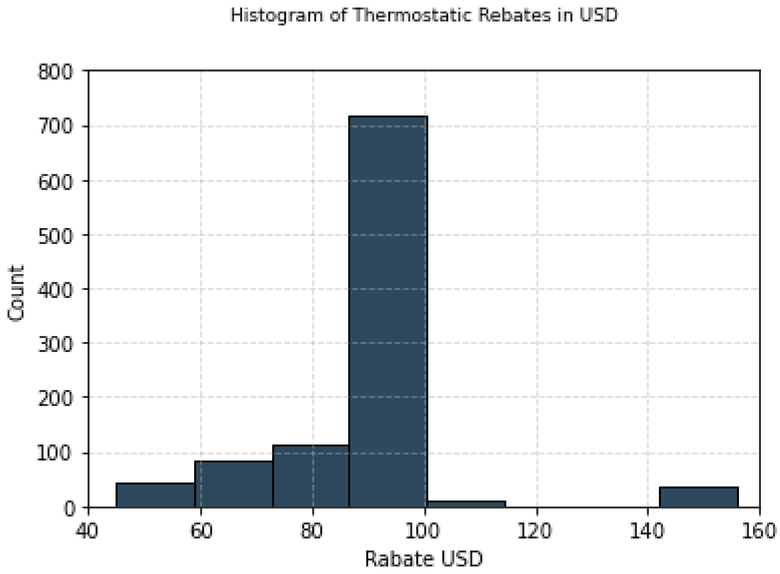
```
rebate = dataset["rebate-usd"]
print(rebate)
```

```
0       88
1       88
2      100
3      100
4      100
      ...
995    100
996    100
997     67
998     90
999    100
Name: rebate-usd, Length: 1000, dtype: int64
```

2) 시각화

In [6]:

```
n, bins, patches = plt.hist(rebate,
8,
facecolor="#2E495E",
edgecolor=(0, 0, 0),
align='mid',
)
# align은 tick과 막대의 위치를 조절합니다.
#디폴트는 ‘center’ 인데 ‘edge’ 로 설정하면
#막대의 아래쪽 끝에 y_tick이 표시됩니다.

plt.axis([40,160,0,800])    # 축 범위 지정 [x min,x max , y min,y max]
plt.grid(True, alpha=0.5, linestyle='--')  # 격자 grid 생성
title_font = {
    'fontsize' : 9
}
plt.title("Histogram of Thermostatic Rebates in USD",title_font,pad=25)
plt.xlabel("Rabate USD")
plt.ylabel("Count")
plt.show()
```



2. 막대/파이 차트 (Bar/Pie charts)

1) 데이터 읽기

In [7]:

```
dataset_path = "data/drugs_data.csv"
dataset = pd.read_csv(dataset_path)

dataset.tail()
```

Out[7]:

	Age	Sex	BP	Cholesterol	NA_to_K	Drug
195	56	F	LOW	HIGH	11.566830	drugC
196	16	M	LOW	HIGH	12.006286	drugC
197	52	M	NORMAL	HIGH	9.894478	drugX
198	23	M	NORMAL	NORMAL	14.019550	drugX
199	40	F	LOW	NORMAL	11.348969	drugX

In [8]:

```
BP = dataset["BP"].value_counts()
BP
```

Out[8]:

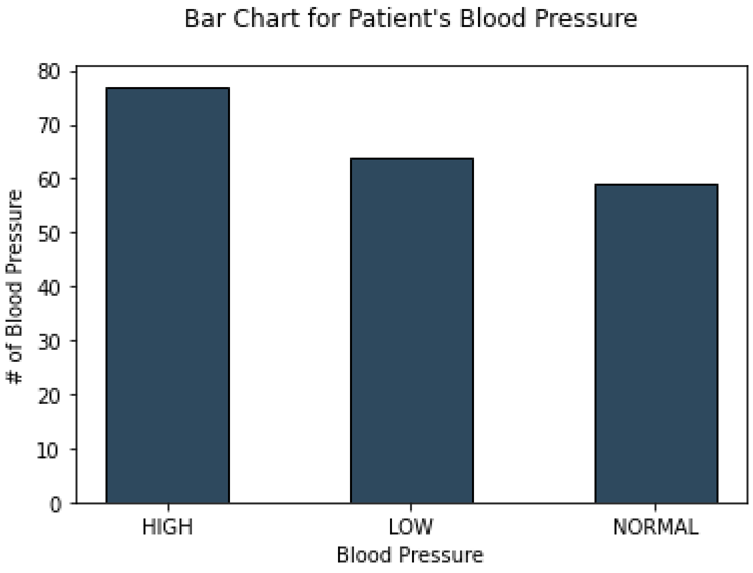
```
HIGH      77
LOW       64
NORMAL    59
Name: BP, dtype: int64
```

2) 시각화

막대 그래프

In [9]:

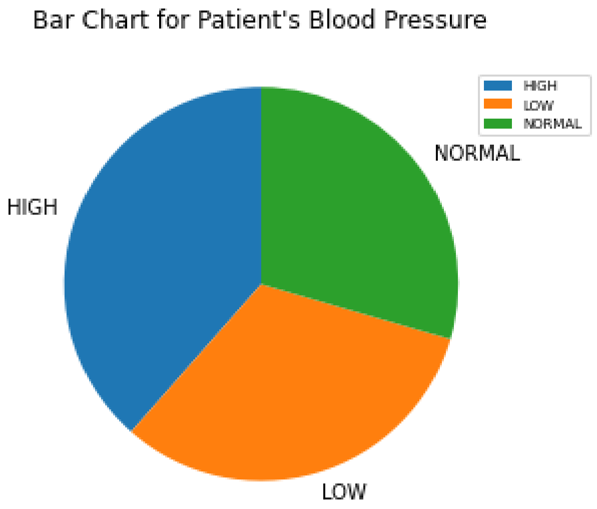
```
plt.bar(BP.keys(),
        BP,                                  # Give each bar its correct height
        0.5,                                 # Give each bar a width of 0.5
        facecolor="#2E495E",
        edgecolor=(0, 0, 0)                  # Black edges for each bar
       )
# align은 tick과 막대의 위치를 조절합니다.
#디폴트는 ‘center’ 인데 ‘edge’ 로 설정하면
#막대의 아래쪽 끝에 y_tick이 표시됩니다.


#plt.grid(True, alpha=0.5, linestyle='--')  # 격자 grid 생성

plt.title("Bar Chart for Patient's Blood Pressure", loc='center', pad=20)
#for loc; supported values are 'left', 'center', 'right'


plt.xlabel("Blood Pressure")
plt.ylabel("# of Blood Pressure")

plt.show()
```



파이 그래프

In [10]:

```
plt.pie(BP,labels=BP.keys(),startangle=90)
plt.title("Bar Chart for Patient's Blood Pressure",pad=20)
                                            # loc='center',pad =20
plt.axis('equal')
plt.legend(loc=1,fontsize=7)     #Location String 'upper right' =1
                                # legend의 폰트 사이즈 조절 가능
plt.show()
```



3. 산점도/직선 그래프 (Scatter/Line plots)

1) 데이터 읽기

In [11]:

```
dataset_path = "data/square-feet_and_house-price.csv"
dataset = pd.read_csv(dataset_path)

dataset.tail()
```

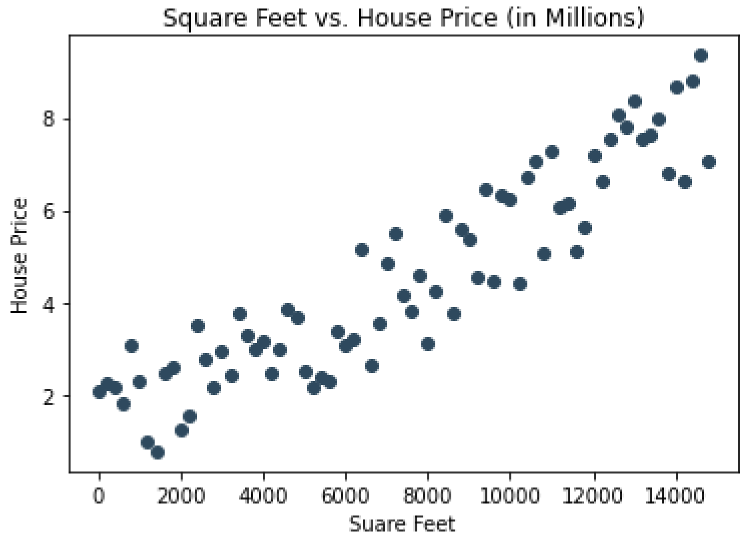
Out[11]:

	square-feet	house-price
70	14000.0	8.678987
71	14200.0	6.636067
72	14400.0	8.787156
73	14600.0	9.358178
74	14800.0	7.071544

2) 시각화

In [12]:

```
sq = dataset["square-feet"]
sq
hp = dataset["house-price"]
hp
plt.scatter(sq,hp,facecolor="#2E495E")

plt.title("Square Feet vs. House Price (in Millions)",pad=5)
                                # loc='center',pad =20
plt.xlabel("Suare Feet")
plt.ylabel("House Price")
plt.show()
```



4. 시계열 그래프 (Time series plot)

1) 데이터 읽기

In [13]:

```
dataset_path = "data/tesla_stock.csv"
dataset = pd.read_csv(dataset_path)

dataset.tail()
```

Out[13]:

	Date	Open	High	Low	Close	Volume
749	2015-01-08	212.81	213.7999	210.0100	210.615	3442509.0
750	2015-01-07	213.35	214.7800	209.7800	210.950	2968390.0
751	2015-01-06	210.06	214.2000	204.2100	211.280	6261936.0
752	2015-01-05	214.55	216.5000	207.1626	210.090	5368477.0
753	2015-01-02	222.87	223.2500	213.2600	219.310	4764443.0

In [14]:

```
sorted_dataset = dataset.sort_values(by='Date')
sorted_dataset.tail()
```

Out[14]:

	Date	Open	High	Low	Close	Volume
4	2017-12-22	329.51	330.9214	324.82	325.20	4186131.0
3	2017-12-26	323.83	323.9400	316.58	317.29	4321909.0
2	2017-12-27	316.00	317.6800	310.75	311.64	4645441.0
1	2017-12-28	311.75	315.8200	309.54	315.36	4294689.0
0	2017-12-29	316.18	316.4100	310.00	311.35	3727621.0

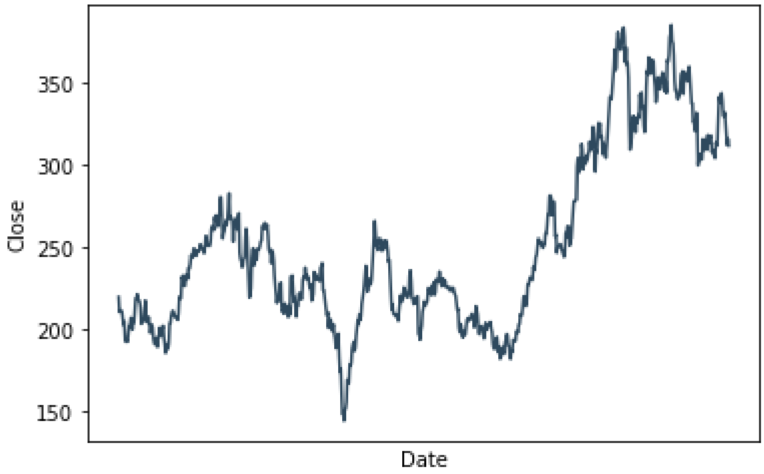
2) 시각화

In [15]:

```
Dt = sorted_dataset["Date"]
Cl = sorted_dataset["Close"]
plt.xticks([])     # x축 표시 안함
plt.xlabel("Date")
plt.ylabel("Close")
plt.plot(Dt,Cl,color="#2E495E")
```

Out[15]:

```
[<matplotlib.lines.Line2D at 0x2804dd032b0>]
```


Close
Date