IAIP 2023-1 HW2 – exercise 4,5,6

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Exercise4

Code:

```
import numpy as np
import openpyxl


file = openpyxl.load_workbook('data_set_train.xlsx')
ws = file.active

data = []
col_name = []

for row in ws.iter_rows(max_row = 1):
  for cell in row:
    col_name.append(cell.value)

for row in ws.iter_rows(min_row = 2):
  one_line = []
  for cell in row:
    one_line.append(cell.value)
  data.append(one_line)



#exercise4
# 2006 avg : 67076.58 ... 2017 까지
arr = np.array(data)
data_set = arr[:, :9]


stdLess = 200601
stdOver = 200701

while 1:

  #1 열이 기준 내인 것의 2 열만 추출
  prices = data_set[(str(stdLess) < data_set[:, 1]) & (data_set[:,1]
< str(stdOver)), 2]

  if (prices.size <= 0) :
    break
```

```
  #데이터타입 변환
  prices = prices.astype(float)

  #평균값 산출
  print(str(stdLess)[:4] + " avg : " + str(round(np.mean(prices), 2))
)

  stdLess += 100
  stdOver += 100
```

Output:

```
2006 avg : 67076.58
2007 avg : 58405.72
2008 avg : 66136.67
2009 avg : 83060.5
2010 avg : 77282.03
2011 avg : 76748.97
2012 avg : 72714.52
2013 avg : 78839.02
2014 avg : 84002.7
2015 avg : 87213.44
2016 avg : 97149.95
2017 avg : 114656.79
```

Exercise5

Code:

```
import numpy as np
import openpyxl


file = openpyxl.load_workbook('data_set_train.xlsx')
ws = file.active

data = []
col_name = []

for row in ws.iter_rows(max_row = 1):
  for cell in row:
    col_name.append(cell.value)

for row in ws.iter_rows(min_row = 2):
  one_line = []
  for cell in row:
    one_line.append(cell.value)
  data.append(one_line)

arr = np.array(data)
data_set = arr[:, :9]



#exercise5
#2006Q1 avg : 65661.17 (tab) ... 2017Q1 까지  4*n 형태로 출력

stdNum = 2006
Q = ['Q1', 'Q2', 'Q3', 'Q4']
count = 0


while 1:

  std = str(stdNum)+Q[count]

  #1 열이 기준 내인인 것의 2 열만 추출
  prices = data_set[std == data_set[:, 1], 2]

  if (prices.size <= 0) :
    break

  #데이터타입 변환
  prices = prices.astype(float)
```

```
  #평균값 산출
  print(std + " avg : " + '%-
10s' % str(round(np.mean(prices), 2)) + "  ", end='')



  count = (count+1)%4
  if count == 0 :
    stdNum += 1
    print()
```

Output:

```
2006Q1 avg : 65661.17   2006Q2 avg : 59592.49   2006Q3 avg : 62410.72   2006Q4 avg : 79588.83
2007Q1 avg : 47336.4    2007Q2 avg : 65344.61   2007Q3 avg : 58634.69   2007Q4 avg : 59687.89
2008Q1 avg : 63515.58   2008Q2 avg : 62458.85   2008Q3 avg : 72233.96   2008Q4 avg : 72608.62
2009Q1 avg : 85574.77   2009Q2 avg : 84314.42   2009Q3 avg : 83246.47   2009Q4 avg : 78589.3
2010Q1 avg : 80386.73   2010Q2 avg : 71885.82   2010Q3 avg : 72697.58   2010Q4 avg : 82475.98
2011Q1 avg : 77359.5    2011Q2 avg : 68071.24   2011Q3 avg : 78499.77   2011Q4 avg : 82607.86
2012Q1 avg : 73633.61   2012Q2 avg : 73102.35   2012Q3 avg : 78050.49   2012Q4 avg : 69313.77
2013Q1 avg : 77980.51   2013Q2 avg : 76391.85   2013Q3 avg : 76638.47   2013Q4 avg : 84570.14
2014Q1 avg : 84038.77   2014Q2 avg : 81931.4    2014Q3 avg : 79218.36   2014Q4 avg : 90134.39
2015Q1 avg : 76180.14   2015Q2 avg : 81677.28   2015Q3 avg : 98509.43   2015Q4 avg : 93279.71
2016Q1 avg : 87456.07   2016Q2 avg : 94492.74   2016Q3 avg : 104774.82  2016Q4 avg : 102236.93
2017Q1 avg : 113074.15  2017Q2 avg : 110766.67  2017Q3 avg : 124098.44
```

Exercise6

Code:

```
import numpy as np
import matplotlib.pyplot as plt
import openpyxl

file = openpyxl.load_workbook('data_set_train.xlsx')
ws = file.active

data = []
col_name = []

for row in ws.iter_rows(max_row = 1):
  for cell in row:
    col_name.append(cell.value)
for row in ws.iter_rows(min_row = 2):
  one_line = []
  for cell in row:
    one_line.append(cell.value)
  data.append(one_line)

arr = np.array(data)
data_set = arr[:, :9]

years = []
tradings = []
pricessss = []

stdNum = 2006
Q = ['Q1', 'Q2', 'Q3', 'Q4']
count = 0

while 1:

  std = str(stdNum)+Q[count]

  #1 열이 기준 내인인 것의 2 열만 추출
  prices = data_set[std == data_set[:, 1], 2]

  if (prices.size <= 0) :
    break

  #데이터타입 변환
  prices = prices.astype(float)

  years.append(std)
```

```
  tradings.append(prices.size)
  pricessss.append(np.mean(prices))

  count = (count+1)%4
  if count == 0 :
    stdNum += 1


 # ------------------------------------------------------------
#exercise6

x = np.arange(len(years))
plt.figure(figsize=(20,7))

#분기별 거래건수 막대그래프
plt.subplot(2, 1, 1)
plt.bar(x, tradings, color='C7', width=0.5, bottom=None, align='cente
r', data=None)
plt.xticks(x, years, fontsize = 5)

#분기별 거래금액평균 꺾은선그래프
plt.subplot(2,1,2)
plt.plot(x, pricessss, color='C3', marker='o', linewidth='0.7', marke
rsize='1')
plt.xticks(x, years, fontsize = 5)

plt.show()
```

Output: