예제1] part01/01pd_series.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

dict_data = {'a':1, 'b':2, 'c':3}
sr = pd.Series(dict_data)
print(type(sr))
print(sr)

list_data = ['2019-01-02', 3.14, 'ABC', 100, True]
sr = pd.Series(list_data)
idx = sr.index
val = sr.values
print(sr)
print(idx)
print(val)


tuple_data = ('유겸', '2012-04-03', '남', True)
sr = pd.Series(tuple_data, index=['이름', '생년월일', '성별', '학생여부'])
#순서를 바꾸면 에러발생
#sr = pd.Series(index=['이름', '생년월일', '성별', '학생여부'], tup_data)
print(sr)
print(sr[0])
print(sr['이름'])

print(sr[[1, 2]])
print(sr[['생년월일', '성별']])

print(sr[1 : 2])
print(sr['생년월일' : '학생여부'])

```

예제2] part01/02pd_dataframe.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

dict_data = {'c0':[1,2,3], 'c1':[4,5,6],
             'c2':[7,8,9], 'c3':[10,11,12],
             'c4':[13,14,15]}
df = pd.DataFrame(dict_data)
print('타입', type(df))
print('데이터프레임1\n', df)

df = pd.DataFrame([[20, '남', '부산'], [17, '여', '서울']],
                  index=['철수', '영희'],
                  columns=['나이', '성별', '지역'])
print('데이터프레임2\n',df)
print(df.index)
print(df.columns)

df.index=['학생1', '학생2']
df.columns=['연령', '남녀', '거주']
print(df)

df.rename(columns={'연령':'No', '남녀':'Gender', '거주':'City'}, inplace=True)
df.rename(index={'학생1':'Student1', '학생2':'Student2'}, inplace=True)
print(df)

stu1 = df.loc['Student1']
stu2 = df.iloc[1]
print(stu1, stu2)

df.drop('Student1', inplace=True)
print(df)

# 오류발생.
#df.drop('Gender')
df.drop('Gender', axis=1)
df.drop('Gender', axis=1, inplace=True)
print(df)

```

예제3] part01/03pd_dataframe_row_column.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

exam_data = {'국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data, index=['유비', '관우', '장비'])
print(df, '\n')

label1 = df.loc['유비']
print(label1, '\n')
position1 = df.iloc[1]
print(position1, '\n')

label2 = df.loc[['유비', '장비']]
print(label2, '\n')
position2 = df.iloc[[0, 1]]
print(position2, '\n')

label3 = df.loc['유비':'장비']
print(label3, '\n')
position3 = df.iloc[0:1]
print(position3, '\n')

math1 = df['수학']
print(math1, '\n')

english = df.영어
print(english, '\n')

column1 = df[['국어', '체육']]
print(column1, '\n')

math2 = df[['수학']]
print(math2, '\n')
```

예제4] part01/04pd_select_element.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

exam_data = {'이름' : [ '유비', '관우', '장비'],
             '국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data)
print(df)

###a = df.loc['유비', '수학'] #오류발생
a = df.loc[0, '수학']
print(a)

df.set_index('이름', inplace=True)
print(df)

a = df.loc['유비', '수학']
print(a)
b = df.iloc[0, 2]
print(b)

c = df.loc['유비', ['수학', '체육']]
print(c)
d = df.iloc[0, [2, 3]]
print(d)
e = df.loc['유비', '수학':'체육']
print(e)
f = df.iloc[0, 2:]
print(f)

g = df.loc[['유비', '관우'], ['수학', '체육']]
print(g)
h = df.iloc[[0, 1], [2, 3]]
print(h)
i = df.loc['유비':'관우', '수학':'체육']
print(i)
j = df.iloc[0:2, 2:]
print(j)

```

예제5] part01/05pd_add_row_column.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

exam_data = {'이름' : [ '유비', '관우', '장비'],
             '국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data)
print(df)

df['역사'] = 80
print(df)

df.loc[3] = 0
print(df)

df.loc[4] = ['제갈량', 90, 80, 70, 60, 50]
print(df)

df.loc['행5'] = df.loc[2]
print(df)

```

예제6] part01/06pd_modify_element.py

```python
# -*- coding: utf-8 -*-
import pandas as pd

exam_data = {'이름' : [ '유비', '관우', '장비'],
             '국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data)


df.set_index('이름', inplace=True)
print(df)

#방법1
df.iloc[0][3] = 80
print(df)
#방법2
df.loc['유비']['체육'] = 90
print(df)
#방법3
df.loc['유비', '체육'] = 100
print(df)

#방법1
df.loc['관우', ['음악', '체육']] = 50
print(df)
#방법2
df.loc['관우', ['음악', '체육']] = 100, 50
print(df)
```

예제7] part01/07pd_transpose.py

```python
# -*- coding: utf-8 -*-

import pandas as pd

exam_data = {'이름' : [ '유비', '관우', '장비'],
             '국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data)
print(df)

df = df.transpose()
print(df)

df = df.T
print(df)

```

여기까지 작성하세요.

예제8] part01/08pd_set_index.py

```python
# -*- coding: utf-8 -*-

import pandas as pd

exam_data = {'이름' : [ '유비', '관우', '장비'],
             '국어' : [ 90, 80, 70],
             '영어' : [ 98, 89, 95],
             '수학' : [ 85, 95, 100],
             '체육' : [ 100, 90, 90]}
df = pd.DataFrame(exam_data)
print(df)

ndf = df.set_index(['이름'])
print(ndf)

ndf2 = ndf.set_index('체육')
print(ndf2)

ndf3 = ndf.set_index(['수학', '영어'])
print(ndf3)
```

예제9] part01/09pd_reindex.py

```python
# -*- coding: utf-8 -*-

import pandas as pd

dict_data = {'c0':[1,2,3], 'c1':[4,5,6], 'c2':[7,8,9],
             'c3':[10,11,12], 'c4':[13,14,15]}

df = pd.DataFrame(dict_data, index=['r0', 'r1', 'r2'])
print(df)

new_index = ['r0', 'r1', 'r2', 'r3', 'r4']
ndf = df.reindex(new_index)
print(ndf)

new_index = ['r0', 'r1', 'r2', 'r3', 'r4']
ndf2 = df.reindex(new_index, fill_value=0)
print(ndf2)

ndf3 = ndf2.reset_index()
print(ndf3)


ndf4 = ndf3.sort_index(ascending=False)
print(ndf4)

ndf5 = ndf4.sort_values(by='c3', ascending=True)
print(ndf5)
```

예제10] part01/10pd_series_to_number.py

```python
# -*- coding: utf-8 -*-

import pandas as pd
import numpy as np

student1 = pd.Series({'국어':100, '영어':80, '수학':90})
print(student1)

percentage = student1 / 200
print(percentage)

student2 = pd.Series({'수학':80, '국어':np.nan, '영어':80})
print(student2)

addition = student1 + student2
subtraction = student1 - student2
multiplication = student1.mul(student2, fill_value=0)
division = student1.div(student2, fill_value=0)

result = pd.DataFrame([addition, subtraction, multiplication, division],
                      index=['덧셈', '뺄셈', '곱셈', '나눗셈'])
print(result)

```

예제11] part01/11pd_dataframe_to_number.py

```
1  # -*- coding: utf-8 -*-
2  import pandas as pd
3  import seaborn as sns
4
5  titanic = sns.load_dataset('titanic')
6  df = titanic.loc[:, ['age','fare']]
7
8  print(df.head())
9  print(df.tail())
10
11 addition = df + 10
12 print(addition.head())
13
14 subtraction = addition - df
15 print(subtraction.head())
16
```