예제1] part01/01pd_series.py

```
# -*- coding: utf-8 -*-
 2
    import pandas as pd
 3
 4
    dict_data = {'a':1, 'b':2, 'c':3}
    sr = pd.Series(dict_data)
 5
 6
    print(type(sr))
7
    print(sr)
8
9
    list_data = ['2019-01-02', 3.14, 'ABC', 100, True]
    sr = pd.Series(list_data)
10
    idx = sr.index
11
    val = sr.values
12
13
    print(sr)
14
    print(idx)
15
    print(val)
16
17
    tuple_data = ('유겸', '2012-04-03', '남', True)
18
    sr = pd.Series(tuple_data, index=['이름', '생년월일', '성별', '학생여부'])
19
    #순서를 바꾸면 에러발생
20
    #sr = pd.Series(index=['이름', '생년월일', '성별', '학생여부'], tup_data)
21
22
    print(sr)
23
    print(sr[0])
    print(sr['이름'])
24
25
26
    print(sr[[1, 2]])
    print(sr[['생년월일', '성별']])
27
28
29
    print(sr[1 : 2])
    print(sr['생년월일': '학생여부'])
30
31
```

예세2] part01/02pd_dataframe.py

```
# -*- coding: utf-8 -*-
 2
     import pandas as pd
 3
     dict_data = {'c0':[1,2,3], 'c1':[4,5,6], 'c2':[7,8,9], 'c3':[10,11,12],
 4
 5
 6
                  'c4':[13,14,15]}
 7
     df = pd.DataFrame(dict_data)
     print('타입', type(df))
 8
 9
     print('데이터프레임1\n', df)
10
     df = pd.DataFrame([[20, '남', '부산'], [17, '여', '서울']],
11
                       index=['철수', '영희'],
columns=['나이', '성별', '지역'])
12
13
     print('데이터프레임2\n',df)
14
15
     print(df.index)
     print(df.columns)
16
17
     df.index=['학생1', '학생2']
18
     df.columns=['연령', '남녀', '거주']
19
     print(df)
20
21
     df.rename(columns={'연령':'No', '남녀':'Gender', '거주':'City'}, inplace=True)
22
23
     df.rename(index={'학생1':'Student1', '학생2':'Student2'}, inplace=True)
     print(df)
24
25
     stu1 = df.loc['Student1']
26
     stu2 = df.iloc[1]
27
     print(stu1, stu2)
28
29
     df.drop('Student1', inplace=True)
30
31
     print(df)
32
     # 오류발생.
33
     #df.drop('Gender')
34
     df.drop('Gender', axis=1)
35
     df.drop('Gender', axis=1, inplace=True)
36
     print(df)
37
38
```

예세3] part01/03pd_dataframe_row_column.py

37

```
# -*- coding: utf-8 -*-
 2
     import pandas as pd
 3
     exam_data = {'국어' : [ 90, 80, 70],
 4
                  '영어' : [ 98, 89, 95],
5
                  '수학' : [ 85, 95, 100],
6
                  '체육' : [ 100, 90, 90]}
7
     df = pd.DataFrame(exam_data, index=['유비', '관우', '장비'])
8
     print(df, '\n')
9
10
     label1 = df.loc['유비']
11
12
     print(label1, '\n')
     position1 = df.iloc[1]
13
     print(position1, '\n')
14
15
     label2 = df.loc[['유비', '장비']]
16
     print(label2, '\n')
17
     position2 = df.iloc[[0, 1]]
18
19
     print(position2, '\n')
20
21
     label3 = df.loc['유비':'장비']
     print(label3, '\n')
22
     position3 = df.iloc[0:1]
23
     print(position3, '\n')
24
25
     math1 = df['수학']
26
     print(math1, '\n')
27
28
     english = df.영어
29
     print(english, '\n')
30
31
     column1 = df[['국어', '체육']]
32
     print(column1, '\n')
33
34
     math2 = df[['수학']]
35
     print(math2, '\n')
36
```

예제4] part01/04pd_select_element.py

```
# -*- coding: utf-8 -*-
1
2
     import pandas as pd
3
     exam_data = {'이름' : [ '유비', '관우', '장비'],
4
5
                  '국어' : [ 90, 80, 70],
                 '영어': [ 98, 89, 95],
6
7
                 '수학' : [ 85, 95, 100],
8
                 '체육': [ 100, 90, 90]}
9
     df = pd.DataFrame(exam_data)
     print(df)
10
11
     ###a = df.loc['유비', '수학'] #오류발생
12
13
     a = df.loc[0, '수학']
     print(a)
14
15
16
     df.set_index('이름', inplace=True)
17
     print(df)
18
19
     a = df.loc['유비', '수학']
20
     print(a)
21
     b = df.iloc[0, 2]
22
     print(b)
23
24
     c = df.loc['유비', ['수학', '체육']]
25
     print(c)
26
     d = df.iloc[0, [2, 3]]
27
     print(d)
     e = df.loc['유비', '수학':'체육']
28
29
     print(e)
     f = df.iloc[0, 2:]
30
31
     print(f)
32
     g = df.loc[['유비', '관우'], ['수학', '체육']]
33
34
     print(g)
35
     h = df.iloc[[0, 1], [2, 3]]
     print(h)
36
     i = df.loc['유비':'관우', '수학':'체육']
37
38
     print(i)
     j = df.iloc[0:2, 2:]
39
     print(j)
40
41
```

예제5] part01/05pd_add_row_column.py

```
# -*- coding: utf-8 -*-
2
     import pandas as pd
3
     exam_data = {'이름' : [ '유비', '관우', '장비'],
'국어' : [ 90, 80, 70],
4
5
                   '영어' : [ 98, 89, 95],
6
                   '수학' : [ 85, 95, 100],
7
                   '체육' : [ 100, 90, 90]}
8
     df = pd.DataFrame(exam_data)
9
     print(df)
10
11
     df['역사'] = 80
12
13
     print(df)
14
15
     df.loc[3] = 0
     print(df)
16
17
     df.loc[4] = ['제갈량', 90, 80, 70, 60, 50]
18
19
     print(df)
20
21
     df.loc['행5'] = df.loc[2]
22
     print(df)
23
```

예세6] part01/06pd_modify_element.py

```
# -*- coding: utf-8 -*-
1
2
    import pandas as pd
3
    exam_data = {'이름' : [ '유비', '관우', '장비'],
'국어' : [ 90, 80, 70],
4
5
                 '영어': [ 98, 89, 95],
6
                 '수학': [85,95,100],
7
                 '체육': [ 100, 90, 90]}
8
9
    df = pd.DataFrame(exam_data)
10
11
    df.set_index('이름', inplace=True)
12
13
    print(df)
14
    #방법1
15
16
    df.iloc[0][3] = 80
17
    print(df)
18
    #방법2
19
    df.loc['유비']['체육'] = 90
20
    print(df)
21
    #방법3
    df.loc['유비', '체육'] = 100
22
23
    print(df)
24
25
    #방법1
    df.loc['관우', ['음악', '체육']] = 50
26
27
    print(df)
    #방법2
28
    df.loc['관우', ['음악', '체육']] = 100, 50
29
    print(df)
30
```

예세7] part01/07pd_transpose.py

```
# -*- coding: utf-8 -*-
 2
3
    import pandas as pd
 4
    exam_data = {'이름' : [ '유비', '관우', '장비'],
 5
                 '국어' : [ 90, 80, 70],
 6
7
                 '영어' : [ 98, 89, 95],
                 '수학' : [ 85, 95, 100],
8
9
                 '체육': [ 100, 90, 90]}
    df = pd.DataFrame(exam_data)
10
11
    print(df)
12
    df = df.transpose()
13
    print(df)
14
15
    df = df.T
16
17
    print(df)
18
```

여기까지 작성하세요.

예세8] part01/08pd_set_index.py

```
# -*- coding: utf-8 -*-
 1
 2
 3
    import pandas as pd
 4
    exam_data = {'이름' : [ '유비', '관우', '장비'],
 5
                 '국어' : [ 90, 80, 70],
 6
                 '영어' : [ 98, 89, 95],
7
                 '수학' : [ 85, 95, 100],
8
9
                 '체육': [ 100, 90, 90]}
    df = pd.DataFrame(exam_data)
10
    print(df)
11
12
    ndf = df.set_index(['이름'])
13
    print(ndf)
14
15
    ndf2 = ndf.set_index('체육')
16
    print(ndf2)
17
18
    ndf3 = ndf.set_index(['수학', '영어'])
19
    print(ndf3)
20
21
```

예제9] part01/09pd_reindex.py

```
# -*- coding: utf-8 -*-
1
 2
3
     import pandas as pd
4
     dict_data = {'c0':[1,2,3], 'c1':[4,5,6], 'c2':[7,8,9],
5
                  'c3':[10,11,12], 'c4':[13,14,15]}
6
7
    df = pd.DataFrame(dict_data, index=['r0', 'r1', 'r2'])
8
9
     print(df)
10
     new_index = ['r0', 'r1', 'r2', 'r3', 'r4']
11
     ndf = df.reindex(new_index)
12
     print(ndf)
13
14
     new_index = ['r0', 'r1', 'r2', 'r3', 'r4']
15
     ndf2 = df.reindex(new_index, fill_value=0)
16
17
     print(ndf2)
18
     ndf3 = ndf2.reset_index()
19
     print(ndf3)
20
21
22
     ndf4 = ndf3.sort_index(ascending=False)
23
     print(ndf4)
24
25
     ndf5 = ndf4.sort_values(by='c3', ascending=True)
26
     print(ndf5)
27
```

예제10] part01/10pd_series_to_number.py

```
# -*- coding: utf-8 -*-
 2
 3
    import pandas as pd
4
    import numpy as np
5
    student1 = pd.Series({'국어':100, '영어':80, '수학':90})
6
7
    print(student1)
8
9
    percentage = student1 / 200
    print(percentage)
10
11
    student2 = pd.Series({'수학':80, '국어':np.nan, '영어':80})
12
13
    print(student2)
14
15
    addition = student1 + student2
    subtraction = student1 - student2
16
    multiplication = student1.mul(student2, fill_value=0)
17
    division = student1.div(student2, fill_value=0)
18
19
    result = pd.DataFrame([addition, subtraction, multiplication, division],
20
                          index=['덧셈', '뺄셈', '곱셈', '나눗셈'])
21
    print(result)
22
23
```

예제11] part01/11pd_dataframe_to_number.py

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