KEY_Practice12_Pandas-Subsetting

February 4, 2020

1 Practice: Subsetting Pandas DataFrames

For this practice, let's use the `iris` dataset:

[4]:
```
# mount Google Drive
from google.colab import drive
drive.mount('/content/gdrive')
path = '/content/gdrive/My Drive/SummerExperience-master/'
```

```
Drive already mounted at /content/gdrive; to attempt to forcibly remount, call
drive.mount("/content/gdrive", force_remount=True).
```

[0]:
```
# import pandas package
import pandas as pd
```

[0]:
```
# this is where the file is located
filename = path + 'SampleData/iris.csv'
# load the iris dataset into a DataFrame
iris = pd.read_csv(filename)
```

Refamiliarize yourself with the dataset:

[7]:
```
# take a look at the beginning

iris.head()
```

[7]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

Try subsetting on columns:

[8]:
```
# subset the species column

iris['species']
```

[8]:
```
0         setosa
1         setosa
2         setosa
3         setosa
4         setosa
5         setosa
6         setosa
7         setosa
8         setosa
9         setosa
10        setosa
11        setosa
12        setosa
13        setosa
14        setosa
15        setosa
16        setosa
17        setosa
18        setosa
19        setosa
20        setosa
21        setosa
22        setosa
23        setosa
24        setosa
25        setosa
26        setosa
27        setosa
28        setosa
29        setosa
          …
120    virginica
121    virginica
122    virginica
123    virginica
124    virginica
125    virginica
126    virginica
127    virginica
128    virginica
129    virginica
130    virginica
131    virginica
132    virginica
133    virginica
134    virginica
135    virginica
```

```
136    virginica
137    virginica
138    virginica
139    virginica
140    virginica
141    virginica
142    virginica
143    virginica
144    virginica
145    virginica
146    virginica
147    virginica
148    virginica
149    virginica
Name: species, Length: 150, dtype: object
```

[9]:
```
# subset the sepal_length and sepal_width columns

iris[ ['sepal_length','sepal_width']]
```

[9]:

	sepal_length	sepal_width
0	5.1	3.5
1	4.9	3.0
2	4.7	3.2
3	4.6	3.1
4	5.0	3.6
5	5.4	3.9
6	4.6	3.4
7	5.0	3.4
8	4.4	2.9
9	4.9	3.1
10	5.4	3.7
11	4.8	3.4
12	4.8	3.0
13	4.3	3.0
14	5.8	4.0
15	5.7	4.4
16	5.4	3.9
17	5.1	3.5
18	5.7	3.8
19	5.1	3.8
20	5.4	3.4
21	5.1	3.7
22	4.6	3.6
23	5.1	3.3
24	4.8	3.4
25	5.0	3.0

```
26            5.0           3.4
27            5.2           3.5
28            5.2           3.4
29            4.7           3.2
..            …             …
120           6.9           3.2
121           5.6           2.8
122           7.7           2.8
123           6.3           2.7
124           6.7           3.3
125           7.2           3.2
126           6.2           2.8
127           6.1           3.0
128           6.4           2.8
129           7.2           3.0
130           7.4           2.8
131           7.9           3.8
132           6.4           2.8
133           6.3           2.8
134           6.1           2.6
135           7.7           3.0
136           6.3           3.4
137           6.4           3.1
138           6.0           3.0
139           6.9           3.1
140           6.7           3.1
141           6.9           3.1
142           5.8           2.7
143           6.8           3.2
144           6.7           3.3
145           6.7           3.0
146           6.3           2.5
147           6.5           3.0
148           6.2           3.4
149           5.9           3.0

[150 rows x 2 columns]
```

Try subsetting on rows:

[10]:
```
# subset the 2nd column

iris[iris.columns[1]]
```

[10]:
```
0      3.5
1      3.0
2      3.2
```

```
3       3.1
4       3.6
5       3.9
6       3.4
7       3.4
8       2.9
9       3.1
10      3.7
11      3.4
12      3.0
13      3.0
14      4.0
15      4.4
16      3.9
17      3.5
18      3.8
19      3.8
20      3.4
21      3.7
22      3.6
23      3.3
24      3.4
25      3.0
26      3.4
27      3.5
28      3.4
29      3.2
        …
120     3.2
121     2.8
122     2.8
123     2.7
124     3.3
125     3.2
126     2.8
127     3.0
128     2.8
129     3.0
130     2.8
131     3.8
132     2.8
133     2.8
134     2.6
135     3.0
136     3.4
137     3.1
138     3.0
```

```
139    3.1
140    3.1
141    3.1
142    2.7
143    3.2
144    3.3
145    3.0
146    2.5
147    3.0
148    3.4
149    3.0
Name: sepal_width, Length: 150, dtype: float64
```

[11]:
```
# subset the first 5 rows

iris.loc[:4]
```

[11]:

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa

[12]:
```
# subset rows 10 through 20

iris.loc[10:20]
```

[12]:

	sepal_length	sepal_width	petal_length	petal_width	species
10	5.4	3.7	1.5	0.2	setosa
11	4.8	3.4	1.6	0.2	setosa
12	4.8	3.0	1.4	0.1	setosa
13	4.3	3.0	1.1	0.1	setosa
14	5.8	4.0	1.2	0.2	setosa
15	5.7	4.4	1.5	0.4	setosa
16	5.4	3.9	1.3	0.4	setosa
17	5.1	3.5	1.4	0.3	setosa
18	5.7	3.8	1.7	0.3	setosa
19	5.1	3.8	1.5	0.3	setosa
20	5.4	3.4	1.7	0.2	setosa

[13]:
```
# subset rows 6, 9, and 12

iris.loc[[6,9,12]]
```

[13]:

	sepal_length	sepal_width	petal_length	petal_width	species
6	4.6	3.4	1.4	0.3	setosa

```
9            4.9          3.1           1.5          0.1  setosa
12           4.8          3.0           1.4          0.1  setosa
```

Now do both!

[14]:
```
# subset the first 3 rows and the first 3 columns

iris.loc[:2][iris.columns[:3]]
```

[14]:
```
   sepal_length  sepal_width  petal_length
0           5.1          3.5           1.4
1           4.9          3.0           1.4
2           4.7          3.2           1.3
```

[15]:
```
# subset row 20 and the species column

iris.loc[20]['species']
```

[15]:
```
'setosa'
```

Now let's subset using `query`:

[16]:
```
# subset rows where sepal_width is greater than 4

iris.query('sepal_width > 4')
```

[16]:
```
    sepal_length  sepal_width  petal_length  petal_width species
15           5.7          4.4           1.5          0.4  setosa
32           5.2          4.1           1.5          0.1  setosa
33           5.5          4.2           1.4          0.2  setosa
```

[17]:
```
# subset rows where sepal_width is less than 3.5 and the species is `virginica`.

iris.query('sepal_width < 3.5 and species=="virginica"')
```

[17]:
```
     sepal_length  sepal_width  petal_length  petal_width    species
100           6.3          3.3           6.0          2.5  virginica
101           5.8          2.7           5.1          1.9  virginica
102           7.1          3.0           5.9          2.1  virginica
103           6.3          2.9           5.6          1.8  virginica
104           6.5          3.0           5.8          2.2  virginica
105           7.6          3.0           6.6          2.1  virginica
106           4.9          2.5           4.5          1.7  virginica
107           7.3          2.9           6.3          1.8  virginica
108           6.7          2.5           5.8          1.8  virginica
110           6.5          3.2           5.1          2.0  virginica
111           6.4          2.7           5.3          1.9  virginica
112           6.8          3.0           5.5          2.1  virginica
```

113	5.7	2.5	5.0	2.0	virginica
114	5.8	2.8	5.1	2.4	virginica
115	6.4	3.2	5.3	2.3	virginica
116	6.5	3.0	5.5	1.8	virginica
118	7.7	2.6	6.9	2.3	virginica
119	6.0	2.2	5.0	1.5	virginica
120	6.9	3.2	5.7	2.3	virginica
121	5.6	2.8	4.9	2.0	virginica
122	7.7	2.8	6.7	2.0	virginica
123	6.3	2.7	4.9	1.8	virginica
124	6.7	3.3	5.7	2.1	virginica
125	7.2	3.2	6.0	1.8	virginica
126	6.2	2.8	4.8	1.8	virginica
127	6.1	3.0	4.9	1.8	virginica
128	6.4	2.8	5.6	2.1	virginica
129	7.2	3.0	5.8	1.6	virginica
130	7.4	2.8	6.1	1.9	virginica
132	6.4	2.8	5.6	2.2	virginica
133	6.3	2.8	5.1	1.5	virginica
134	6.1	2.6	5.6	1.4	virginica
135	7.7	3.0	6.1	2.3	virginica
136	6.3	3.4	5.6	2.4	virginica
137	6.4	3.1	5.5	1.8	virginica
138	6.0	3.0	4.8	1.8	virginica
139	6.9	3.1	5.4	2.1	virginica
140	6.7	3.1	5.6	2.4	virginica
141	6.9	3.1	5.1	2.3	virginica
142	5.8	2.7	5.1	1.9	virginica
143	6.8	3.2	5.9	2.3	virginica
144	6.7	3.3	5.7	2.5	virginica
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

[18]:
```
# subset rows where the pedal width is 0.3 or the species is `versicolor`.

iris.query( 'petal_width==0.3 or species=="versicolor"' )
```

[18]:

	sepal_length	sepal_width	petal_length	petal_width	species
6	4.6	3.4	1.4	0.3	setosa
17	5.1	3.5	1.4	0.3	setosa
18	5.7	3.8	1.7	0.3	setosa
19	5.1	3.8	1.5	0.3	setosa
40	5.0	3.5	1.3	0.3	setosa
41	4.5	2.3	1.3	0.3	setosa

45	4.8	3.0	1.4	0.3	setosa
50	7.0	3.2	4.7	1.4	versicolor
51	6.4	3.2	4.5	1.5	versicolor
52	6.9	3.1	4.9	1.5	versicolor
53	5.5	2.3	4.0	1.3	versicolor
54	6.5	2.8	4.6	1.5	versicolor
55	5.7	2.8	4.5	1.3	versicolor
56	6.3	3.3	4.7	1.6	versicolor
57	4.9	2.4	3.3	1.0	versicolor
58	6.6	2.9	4.6	1.3	versicolor
59	5.2	2.7	3.9	1.4	versicolor
60	5.0	2.0	3.5	1.0	versicolor
61	5.9	3.0	4.2	1.5	versicolor
62	6.0	2.2	4.0	1.0	versicolor
63	6.1	2.9	4.7	1.4	versicolor
64	5.6	2.9	3.6	1.3	versicolor
65	6.7	3.1	4.4	1.4	versicolor
66	5.6	3.0	4.5	1.5	versicolor
67	5.8	2.7	4.1	1.0	versicolor
68	6.2	2.2	4.5	1.5	versicolor
69	5.6	2.5	3.9	1.1	versicolor
70	5.9	3.2	4.8	1.8	versicolor
71	6.1	2.8	4.0	1.3	versicolor
72	6.3	2.5	4.9	1.5	versicolor
73	6.1	2.8	4.7	1.2	versicolor
74	6.4	2.9	4.3	1.3	versicolor
75	6.6	3.0	4.4	1.4	versicolor
76	6.8	2.8	4.8	1.4	versicolor
77	6.7	3.0	5.0	1.7	versicolor
78	6.0	2.9	4.5	1.5	versicolor
79	5.7	2.6	3.5	1.0	versicolor
80	5.5	2.4	3.8	1.1	versicolor
81	5.5	2.4	3.7	1.0	versicolor
82	5.8	2.7	3.9	1.2	versicolor
83	6.0	2.7	5.1	1.6	versicolor
84	5.4	3.0	4.5	1.5	versicolor
85	6.0	3.4	4.5	1.6	versicolor
86	6.7	3.1	4.7	1.5	versicolor
87	6.3	2.3	4.4	1.3	versicolor
88	5.6	3.0	4.1	1.3	versicolor
89	5.5	2.5	4.0	1.3	versicolor
90	5.5	2.6	4.4	1.2	versicolor
91	6.1	3.0	4.6	1.4	versicolor
92	5.8	2.6	4.0	1.2	versicolor
93	5.0	2.3	3.3	1.0	versicolor
94	5.6	2.7	4.2	1.3	versicolor
95	5.7	3.0	4.2	1.2	versicolor

```
    96          5.7         2.9          4.2         1.3  versicolor
    97          6.2         2.9          4.3         1.3  versicolor
    98          5.1         2.5          3.0         1.1  versicolor
    99          5.7         2.8          4.1         1.3  versicolor
```

[0]: