

Merge, Join and Concatenate

```
In [1]: import pandas as pd
```

```
In [3]: df1 = pd.read_csv(r"D:\COURSES\YOUTUBE\ALEX THE ANALYST\PYTHON\LOTR.csv")
df1
```

Out[3]:

	FellowshipID	FirstName	Skills
0	1001	Frodo	Hiding
1	1002	Samwise	Gardening
2	1003	Gandalf	Spells
3	1004	Pippin	Fireworks

```
In [4]: df2 = pd.read_csv(r"D:\COURSES\YOUTUBE\ALEX THE ANALYST\PYTHON\LOTR 2.csv")
df2
```

Out[4]:

	FellowshipID	FirstName	Age
0	1001	Frodo	50
1	1002	Samwise	39
2	1006	Legolas	2931
3	1007	Elrond	6520
4	1008	Barromir	51

```
In [5]: df1.merge(df2)
```

Out[5]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	50
1	1002	Samwise	Gardening	39

```
In [6]: df1.merge(df2, how='inner', on='FellowshipID')
```

Out[6]:

	FellowshipID	FirstName_x	Skills	FirstName_y	Age
0	1001	Frodo	Hiding	Frodo	50
1	1002	Samwise	Gardening	Samwise	39

```
In [7]: df1.merge(df2, how='outer')
```

Out[7]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	50.0
1	1002	Samwise	Gardening	39.0
2	1003	Gandalf	Spells	NaN
3	1004	Pippin	Fireworks	NaN
4	1006	Legolas	NaN	2931.0
5	1007	Elrond	NaN	6520.0
6	1008	Barromir	NaN	51.0

```
In [8]: df1.merge(df2, how='left')
```

Out[8]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	50.0
1	1002	Samwise	Gardening	39.0
2	1003	Gandalf	Spells	NaN
3	1004	Pippin	Fireworks	NaN

```
In [9]: df1.merge(df2, how='right')
```

Out[9]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	50
1	1002	Samwise	Gardening	39
2	1006	Legolas	NaN	2931
3	1007	Elrond	NaN	6520
4	1008	Barromir	NaN	51

```
In [10]: df1.merge(df2, how='cross')
```

```
Out[10]:
```

	FellowshipID_x	FirstName_x	Skills	FellowshipID_y	FirstName_y	Age
0	1001	Frodo	Hiding	1001	Frodo	50
1	1001	Frodo	Hiding	1002	Samwise	39
2	1001	Frodo	Hiding	1006	Legolas	2931
3	1001	Frodo	Hiding	1007	Elrond	6520
4	1001	Frodo	Hiding	1008	Barromir	51
5	1002	Samwise	Gardening	1001	Frodo	50
6	1002	Samwise	Gardening	1002	Samwise	39
7	1002	Samwise	Gardening	1006	Legolas	2931
8	1002	Samwise	Gardening	1007	Elrond	6520
9	1002	Samwise	Gardening	1008	Barromir	51
10	1003	Gandalf	Spells	1001	Frodo	50
11	1003	Gandalf	Spells	1002	Samwise	39
12	1003	Gandalf	Spells	1006	Legolas	2931
13	1003	Gandalf	Spells	1007	Elrond	6520
14	1003	Gandalf	Spells	1008	Barromir	51
15	1004	Pippin	Fireworks	1001	Frodo	50
16	1004	Pippin	Fireworks	1002	Samwise	39
17	1004	Pippin	Fireworks	1006	Legolas	2931
18	1004	Pippin	Fireworks	1007	Elrond	6520
19	1004	Pippin	Fireworks	1008	Barromir	51

```
In [11]: JOIN
df1.join(df2, on='FellowshipID', how='outer', lsuffix='_left', rsuffix='_right')
```

Out[11]:

	FellowshipID	FellowshipID_left	FirstName_left	Skills	FellowshipID_right	FirstName_right
0.0	1001	1001.0	Frodo	Hiding	NaN	Na
1.0	1002	1002.0	Samwise	Gardening	NaN	Na
2.0	1003	1003.0	Gandalf	Spells	NaN	Na
3.0	1004	1004.0	Pippin	Fireworks	NaN	Na
NaN	0	NaN	NaN	NaN	1001.0	Frod
NaN	1	NaN	NaN	NaN	1002.0	Samwis
NaN	2	NaN	NaN	NaN	1006.0	Legola
NaN	3	NaN	NaN	NaN	1007.0	Elron
NaN	4	NaN	NaN	NaN	1008.0	Barrom

```
In [12]: df4=df1.set_index('FellowshipID').join(df2.set_index('FellowshipID'),lsuffix='_left',rsuffix='_right')
df4
```

Out[12]:

	FirstName_Left	Skills	FirstName_Right	Age
FellowshipID				
1001	Frodo	Hiding	Frodo	50.0
1002	Samwise	Gardening	Samwise	39.0
1003	Gandalf	Spells	NaN	NaN
1004	Pippin	Fireworks	NaN	NaN

```
In [13]: df4=df1.set_index('FellowshipID').join(df2.set_index('FellowshipID'),lsuffix='_left',rsuffix='_right')
df4
```

Out[13]:

	FirstName_Left	Skills	FirstName_Right	Age
FellowshipID				
1001	Frodo	Hiding	Frodo	50.0
1002	Samwise	Gardening	Samwise	39.0
1003	Gandalf	Spells	NaN	NaN
1004	Pippin	Fireworks	NaN	NaN
1006	NaN	NaN	Legolas	2931.0
1007	NaN	NaN	Elrond	6520.0
1008	NaN	NaN	Barromir	51.0

```
In [14]: #Concatenate  
pd.concat([df1,df2])
```

Out[14]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	NaN
1	1002	Samwise	Gardening	NaN
2	1003	Gandalf	Spells	NaN
3	1004	Pippin	Fireworks	NaN
0	1001	Frodo	NaN	50.0
1	1002	Samwise	NaN	39.0
2	1006	Legolas	NaN	2931.0
3	1007	Elrond	NaN	6520.0
4	1008	Barromir	NaN	51.0

```
In [15]: pd.concat([df1,df2], join='inner')
```

Out[15]:

	FellowshipID	FirstName
0	1001	Frodo
1	1002	Samwise
2	1003	Gandalf
3	1004	Pippin
0	1001	Frodo
1	1002	Samwise
2	1006	Legolas
3	1007	Elrond
4	1008	Barromir

```
In [16]: pd.concat([df1,df2], join='outer')
```

Out[16]:

	FellowshipID	FirstName	Skills	Age
0	1001	Frodo	Hiding	NaN
1	1002	Samwise	Gardening	NaN
2	1003	Gandalf	Spells	NaN
3	1004	Pippin	Fireworks	NaN
0	1001	Frodo	NaN	50.0
1	1002	Samwise	NaN	39.0
2	1006	Legolas	NaN	2931.0
3	1007	Elrond	NaN	6520.0
4	1008	Barromir	NaN	51.0

```
In [17]: pd.concat([df1,df2], join='outer', axis=1)
```

Out[17]:

	FellowshipID	FirstName	Skills	FellowshipID	FirstName	Age
0	1001.0	Frodo	Hiding	1001	Frodo	50
1	1002.0	Samwise	Gardening	1002	Samwise	39
2	1003.0	Gandalf	Spells	1006	Legolas	2931
3	1004.0	Pippin	Fireworks	1007	Elrond	6520
4	NaN	NaN	NaN	1008	Barromir	51

In []: