

# Replace and Rename

In this lesson, functions to replace values and renaming indexes are discussed.

## We'll cover the following



- Replace values
  - Replace in Series
  - Replace in DataFrame
- Renaming indexes

## Replace values #

The `pandas` package provides built-in functions to replace values in a `Series` and a `DataFrame`. The `replace()` function is called by both `Series` and `DataFrame` objects to execute this task.

# Replace Single Value

Value to be  
Changed in a  
Series or DataFrame

**replace(current value, new value)**

New value to  
replace the old value in  
Series or DataFrame

# Replace Multiple Values

Value to be  
Changed in a  
Series or DataFrame

**replace([val1,val2],[new\_v1,new\_v2])**

New value to  
replace the old value in  
Series or DataFrame

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—

[ ]

## Replace in **Series** #

The following example shows how to replace single and multiple values in a **Series** object.

```
import numpy as np
import pandas as pd

srs = pd.Series(['A','B','C','D','D','C','A','B'])

print("Original series:")
print(srs, '\n')

print("Single value changed in Series:")
print(srs.replace('A', np.nan), '\n')
```



```
print("Multiple values changed in Series:")
print(srs.replace(['A','C'], [1, 3]))
```



On **line 10**, a single value **A** is replaced with **NaN** value. All the **A**s in the **Series** are replaced with the **NaN** value.

On **line 13**, the same syntax is followed for multiple values, but now two lists are passed in the **replace()** function. The first list contains **A** and **C**; it specifies which values to change. The second list contains **1** and **3**; it specifies what the corresponding value changes are.

It can be seen from the output that both **Series** have their corresponding values changed to the specified values.

## Replace in **DataFrame** #

The following example shows how to replace single and multiple values in a **DataFrame** object. Some *real\_estate* data is used to perform the **replace** operation. The sample file for this data can be obtained from [here](#).

main.py

real\_estate.csv

All code files are copied to end of the page...



On **line 7**, the same syntax like **Series** is also followed for the **DataFrame**, and it can be seen in the output that all instances of **SACRAMENTO** are replaced with **Changed SACRAMENTO**.

On **line 11**, two lists are passed just like in the **Series** section to replace multiple items.

## Renaming indexes #

There are several cases where we need to change the index names or values to indicate new or improved data. There are other methods, but the **rename()** function of pandas is used to perform this task efficiently.

```
import numpy as np
import pandas as pd
```

```
df = pd.DataFrame(abs(np.random.randn(9)).reshape(3,3),
                  index = ['row1', 'row2', 'row3'],
                  columns = ['col1', 'col2', 'col3'])
print("The original DataFrame\n", df, '\n')
print("All row and column indexes are changed")
print(df.rename(index = str.upper, columns = str.title), '\n')

print("Specific row and column indexes are changed")
print(df.rename(index = {'row3':'row_index3'}, columns = {'col3':'col_index3'}))
```

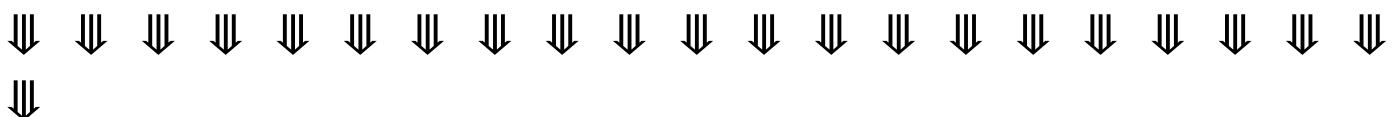


The `rename()` function takes two parameters. In the `index` parameter, new row index names need to be defined, and in the `column` parameter, the column index names need to be defined. In the example program, the index name is changed in two ways:

- On **line 9**, the `index` is assigned `str.upper`. This changes all the row index names to *uppercase*. The `column` is assigned `str.title`. This changes all the column indexes to *title case*.
- On **line 12**, only specific index names are changed instead of all of them. A dictionary is passed to the `index` and `column` parameters defining which specific index names to change.

That's it for the replace and rename functions for now. In the next lesson, finding outliers in data is discussed.

## Code Files Content !!!



```
-----
|  main.py [1]
|  -----
```

```
import numpy as np
```

```

import numpy as np
import pandas as pd

df = pd.read_csv('real_estate.csv')

print("Single value changed in DataFrame:")
df = df.replace("SACRAMENTO", "Changed SACRAMENTO")
print(df.head(), '\n')

print("Multiple values changed in DataFrame:")
df = df.replace(["Changed SACRAMENTO",'CA'], ["New SACRAMENTO","AC"])
print(df.head())

```

```

-----
| real_estate.csv [1]
-----

```

```

city,zip,state,beds,baths,sq__ft,type,price
SACRAMENTO,95838,CA,2,1,836,Residential,59222
SACRAMENTO,95823,CA,3,1,1167,Residential,68212
SACRAMENTO,95815,CA,2,1,796,Residential,68880
SACRAMENTO,95815,CA,2,1,852,Residential,69307
SACRAMENTO,95824,CA,2,1,797,Residential,81900
SACRAMENTO,95841,CA,3,1,1122,Condo,89921
SACRAMENTO,95842,CA,3,2,1104,Residential,90895
SACRAMENTO,95820,CA,3,1,1177,Residential,91002
RANCHO CORDOVA,95670,CA,2,2,941,Condo,94905
RIO LINDA,95673,CA,3,2,1146,Residential,98937
SACRAMENTO,95838,CA,3,2,909,Residential,100309
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SACRAMENTO,95822,CA,3,1,1020,Residential,107502
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RIO LINDA,95673,CA,2,1,844,Residential,113263
CITRUS HEIGHTS,95621,CA,2,1,795,Condo,116250
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CITRUS HEIGHTS,95621,CA,3,2,1118,Residential,122000
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SACRAMENTO,95827,CA,3,2,1380,Residential,136500
ELVERTA,95626,CA,3,2,1116,Residential,138750
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```

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ANTELOPE,95843,CA,3,2,1567,Residential,261000  
LINCOLN,95648,CA,4,2,0,Residential,261800  
SACRAMENTO,95822,CA,4,2,1253,Residential,264469  
ANTELOPE,95843,CA,4,3,1768,Residential,265000  
SACRAMENTO,95835,CA,0,0,0,Residential,270000  
SACRAMENTO,95835,CA,4,3,2030,Residential,270000  
SACRAMENTO,95835,CA,3,2,1531,Residential,270000  
SACRAMENTO,95834,CA,0,0,0,Residential,270000  
ELK GROVE,95624,CA,4,3,1653,Residential,275000  
ELK GROVE,95758,CA,4,2,2056,Residential,275000  
ELK GROVE,95624,CA,4,3,2494,Residential,280000  
FAIR OAKS,95628,CA,3,2,1450,Residential,286013  
SACRAMENTO,95834,CA,4,2,2169,Residential,292000  
ROSEVILLE,95747,CA,3,2,1440,Residential,292000  
FAIR OAKS,95628,CA,3,2,1527,Residential,293993  
ROSEVILLE,95678,CA,3,2,1401,Residential,294000  
SACRAMENTO,95838,CA,3,2,1411,Residential,296769  
LINCOLN,95648,CA,4,4,0,Residential,297500  
GOLD RIVER,95670,CA,0,0,0,Condo,300000  
RIO LINDA,95673,CA,3,1,1284,Residential,300000  
GALT,95632,CA,4,3,2307,Residential,300000  
PLACERVILLE,95667,CA,3,2,1329,Residential,300000  
SACRAMENTO,95835,CA,4,2,1910,Residential,300500  
GOLD RIVER,95670,CA,3,2,1981,Residential,305000  
ROSEVILLE,95747,CA,0,0,0,Residential,306500  
SACRAMENTO,95835,CA,0,0,0,Residential,312500  
LINCOLN,95648,CA,5,3,0,Residential,315000  
SACRAMENTO,95823,CA,4,2,2205,Residential,319789  
LINCOLN,95648,CA,2,2,1449,Residential,330000  
FOLSOM,95630,CA,3,2,1258,Residential,330000

ELK GROVE,95757,CA,3,2,2575,Residential,331000  
SACRAMENTO,95820,CA,2,1,539,Residential,334000  
RANCHO CORDOVA,95670,CA,4,3,2208,Residential,336000  
  
SACRAMENTO,95819,CA,3,1,1108,Residential,339000  
FOLSOM,95630,CA,4,2,1595,Residential,339000  
GALT,95632,CA,4,2,2159,Residential,345000  
PLACERVILLE,95667,CA,4,3,2295,Residential,350000  
ROSEVILLE,95678,CA,3,2,1838,Residential,356000  
SACRAMENTO,95823,CA,4,2,1900,Residential,361745  
SACRAMENTO,95811,CA,4,2,1718,Residential,361948  
ELK GROVE,95757,CA,5,3,3389,Residential,370000  
ROCKLIN,95677,CA,4,2,0,Residential,380000  
ELK GROVE,95757,CA,5,4,3260,Residential,385000  
CAMERON PARK,95682,CA,3,2,2016,Residential,399000  
ROCKLIN,95765,CA,4,2,2607,Residential,402000  
ELK GROVE,95757,CA,4,3,2724,Residential,406026  
GALT,95632,CA,5,4,3746,Residential,420000  
RANCHO CORDOVA,95742,CA,0,0,0,Residential,425000  
RANCHO MURIETA,95683,CA,4,2,3192,Residential,425000  
SACRAMENTO,95834,CA,0,0,0,Residential,433500  
LINCOLN,95648,CA,4,3,0,Residential,436746  
EL DORADO HILLS,95762,CA,5,3,0,Residential,438700  
SACRAMENTO,95811,CA,2,1,1247,Residential,445000  
FOLSOM,95630,CA,4,2,2581,Residential,450000  
SACRAMENTO,95841,CA,3,1,2068,Residential,460000  
EL DORADO HILLS,95762,CA,3,2,0,Residential,460000  
ELK GROVE,95624,CA,4,3,3992,Residential,460000  
SACRAMENTO,95835,CA,4,4,3397,Residential,465000  
SACRAMENTO,95835,CA,5,3,3881,Residential,471750  
ROCKLIN,95765,CA,5,3,0,Residential,480000  
CARMICHAEL,95608,CA,2,2,1598,Residential,484000  
PLACERVILLE,95667,CA,4,3,1929,Residential,485000  
ELK GROVE,95757,CA,4,3,3070,Residential,495000  
ROSEVILLE,95678,CA,0,0,0,Residential,500500  
AUBURN,95603,CA,3,3,0,Residential,504000  
EL DORADO HILLS,95762,CA,0,0,0,Residential,541000  
WILTON,95693,CA,0,0,0,Residential,560000  
SACRAMENTO,95829,CA,5,3,3984,Residential,572500  
CARMICHAEL,95608,CA,4,2,2222,Residential,582000  
ROSEVILLE,95661,CA,4,3,3838,Residential,613401  
ROSEVILLE,95747,CA,4,2,0,Residential,614000  
FAIR OAKS,95628,CA,5,5,2846,Residential,680000  
SACRAMENTO,95819,CA,5,2,2484,Residential,699000  
LOOMIS,95650,CA,4,4,1624,Residential,839000  
SACRAMENTO,95842,CA,2,1,840,Condo,40000  
SACRAMENTO,95825,CA,1,1,484,Condo,48000  
SACRAMENTO,95815,CA,3,1,970,Residential,61500  
SACRAMENTO,95817,CA,2,1,623,Residential,62050  
SACRAMENTO,95820,CA,2,1,932,Residential,65000  
SACRAMENTO,95838,CA,2,1,796,Residential,65000  
SACRAMENTO,95820,CA,2,1,834,Residential,68000  
SACRAMENTO,95820,CA,2,1,834,Residential,68000  
SACRAMENTO,95841,CA,2,1,924,Condo,77000  
SACRAMENTO,95842,CA,2,1,795,Condo,82732  
SACRAMENTO,95838,CA,3,1,1250,Residential,84000  
SACRAMENTO,95820,CA,2,1,984,Residential,84675  
SACRAMENTO,95828,CA,3,1,1013,Residential,85000  
SACRAMENTO,95822,CA,3,1,1012,Residential,90000  
SACRAMENTO,95826,CA,2,1,795,Condo,90000  
SACRAMENTO,95838,CA,2,2,918,Residential,91000  
SACRAMENTO,95838,CA,3,1,1082,Residential,95000  
SACRAMENTO,95842,CA,2,1,964,Residential,97500

SACRAMENTO,95815,CA,4,2,1404,Multi-Family,100000  
SACRAMENTO,95826,CA,1,1,625,Condo,100000  
CITRUS HEIGHTS,95621,CA,2,1,888,Residential,101000  
SACRAMENTO,95815,CA,4,2,1120,Residential,102750  
NORTH HIGHLANDS,95660,CA,3,1,1331,Residential,112500  
SACRAMENTO,95821,CA,3,1,1014,Residential,113000  
SACRAMENTO,95820,CA,4,2,1448,Residential,114000  
SACRAMENTO,95838,CA,3,1,966,Residential,114000  
SACRAMENTO,95823,CA,2,1,779,Residential,114750  
ANTELOPE,95843,CA,2,2,836,Condo,115000

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