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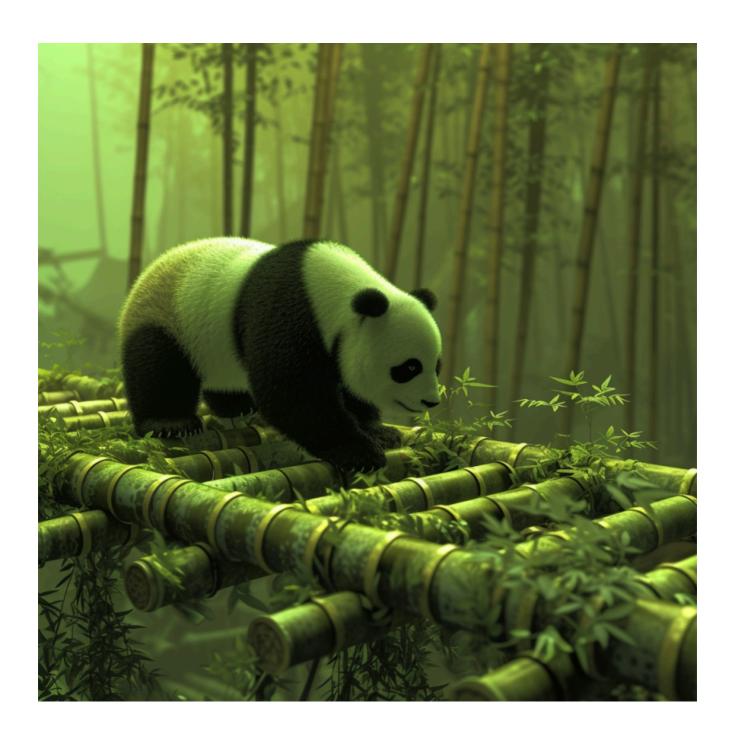
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When working with data in Python, a common task is integrating a Pandas Series into an existing DataFrame. Users may need to add a Series as a new column to enrich or complement the DataFrame's data. The input would be a Pandas DataFrame and a Series, with the desired output being an updated DataFrame that includes the Series as a new column.

## Method 1: Assigning With Bracket Notation

Bracket notation is a straightforward method to add a Series to a DataFrame, providing a way to assign the series to a new column. The column name is specified in brackets, and the Series is assigned to this new key in the DataFrame's dictionary.

Here's an example:



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A B C
0 1 4 7
1 2 5 8
2 3 6 9

This code snippet creates a new DataFrame column named 'C', assigning the values of the Series s to it. The Series index aligns with the DataFrame's index, adding the values vertically.

## Method 2: Using the DataFrame.insert() Function

The insert() method provides a more controlled way of adding a Series to a DataFrame by specifying the exact position for the new column. For precise data manipulation, this flexibility can be extremely useful.



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```
# Using insert() to add Series at a specific index
df.insert(1, 'NewColumn', s)
print(df)
```

#### Output:

	Α	NewColumn	В
0	1	7	4
1	2	8	5
2	3	9	6

This snippet uses the <code>insert()</code> function to add the 'NewColumn' Series at index 1, which places it between the existing 'A' and 'B' columns of the DataFrame. It showcases how to position a Series precisely within a DataFrame.

# Method 3: Concatenating with pd.concat()

For more complex scenarios, such as when the Series index does not match the DataFrame index, pd.concat() can concatenate



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```
# Existing DataFrame
df = pd.DataFrame({'A': [1, 2, 3]})

# Series with a different index
s = pd.Series([4, 5, 6], name='B', index=[3, 4, 5])

# Concatenating the Series to the DataFrame
result = pd.concat([df, s], axis=1)

print(result)
```

#### Output:

```
A B
0 1.0 NaN
1 2.0 NaN
2 3.0 NaN
3 NaN 4.0
4 NaN 5.0
5 NaN 6.0
```

This method concatenates the Series s to the DataFrame df, resulting in a union of the DataFrame and Series indexes. Where there are missing values, NaN is filled in, preserving the data integrity of both original structures.

## Method 4: Using DataFrame.assign()



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#### Here's an example:

```
import pandas as pd

# Existing DataFrame
df = pd.DataFrame({'A': [1, 2, 3]})

# Series to add
s = pd.Series([4, 5, 6], name='B')

# Using assign to add the Series
new_df = df.assign(B=s)

print(new_df)
```

#### Output:

A B **0 1 4** 

1 2 5

2 3 6

This code snippet uses <code>assign()</code> to add the Series <code>s</code> as a new column named 'B' to the DataFrame <code>df</code>. The original DataFrame remains unchanged, while <code>new\_df</code> is the updated DataFrame with the new column.

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operation, making this a succinct and powerful one-liner.

Here's an example:

```
import pandas as pd

# Existing DataFrame
df = pd.DataFrame({'A': [1, 2, 3]})

# Series to add
series_dict = {'B': pd.Series([4, 5, 6]), 'C': pd.Series([7, 8, 9])}

# Using assign with expanded dictionary
new_df = df.assign(**series_dict)

print(new_df)
```

#### Output:

```
A B C
0 1 4 7
1 2 5 8
2 3 6 9
```

This snippet demonstrates the dynamism of Python's argument expansion to apply a dictionary of Series directly to the <code>assign()</code> function, resulting in a



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- **Method 2:** insert() Function. Allows for precise column placement. The syntax can be a bit more verbose compared to other methods.
- Method 3: pd.concat() Handles non-aligning indices effectively. Might require additional steps to clean up NaN values if the union of indices was not the intention.
- Method 4: assign() Method. Offers a functional approach conducive to chaining and does not modify the original DataFrame. It may become less readable with complex operations.
- Method 5: One-Liner Expansion. Quick and powerful for adding multiple Series. Requires an understanding of Python's argument expansion and may complicate debugging.
- **Data Conversion**, Pandas Library, Python
- Transforming Python Pandas Series to Lowercase: 5 Effective Methods
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