Analytics Jumpstart

Joining Dataframes

Nashville Software School

For today

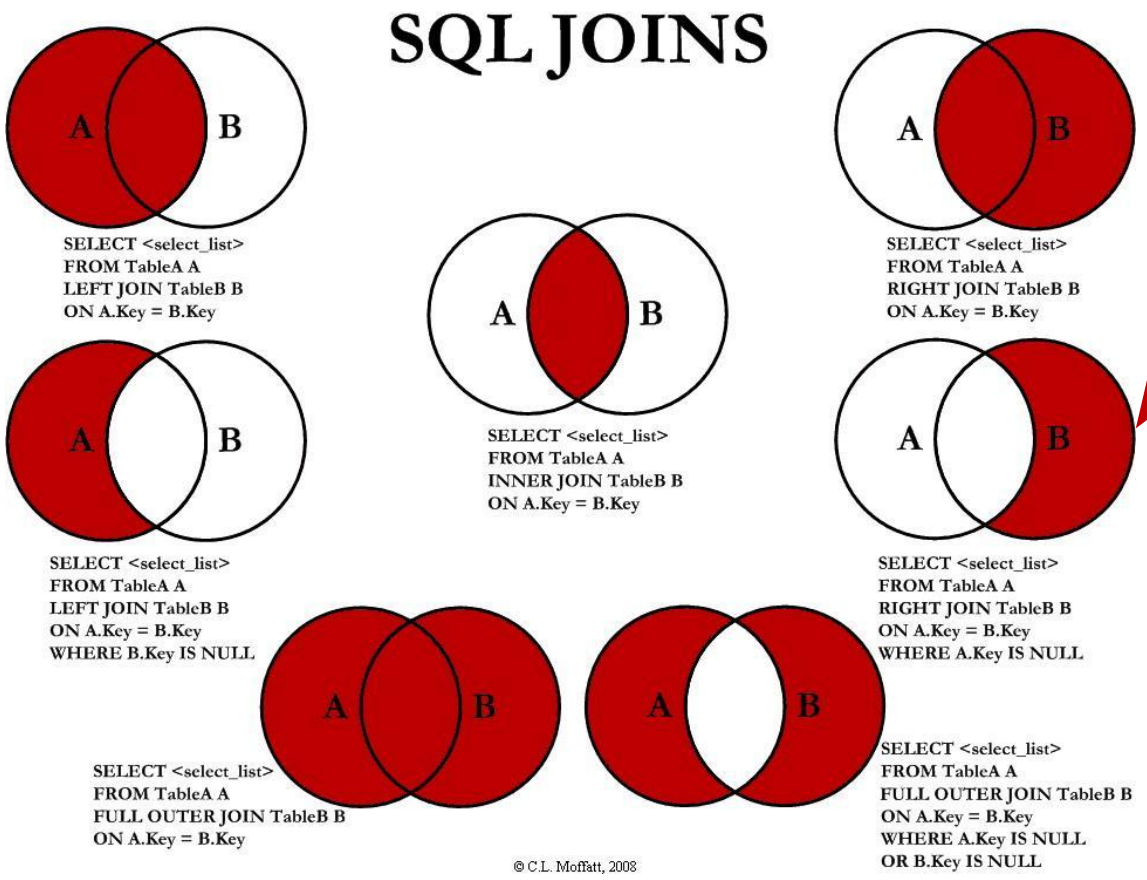
- More pandas
  - Merging vs. Concatenating
  - Aggregating
  - groupby

- **df.groupby(col) –** groups the DataFrame by the specified column
- **df.groupby(col).size()** – groups by a column and gets the size of each group
- **df.groupby([col_a, col_b]).agg(func) –** groups the DataFrame by col_a and then col_b, then performs the specified aggregation function on each group
- **df.reset_index()** – useful for resetting the index after aggregation (moves the aggregation column from the row index to a column and uses zero-based row indexing)
- **df_1.append(df_2)** – stacks two DataFrames on top of each other. Does not pay attention to column numbers or names
- **pd.concat([df_1, df_2])** – combines list of DataFrames vertically or horizontally. Tries to align along concatenation axis
- **pd.merge(df_1, df_2, on, how)** – horizontally combine two DataFrames using column contents and following defined merging approaches.

Get Data → Process + Clean Data → Exploratory Data Analysis

Merging two DataFrames:

pd.merge(*<df1>, <df2>, on = <col or list of cols to join on>, how = <join_type>*)



Same concept as a SQL join

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DataFrame 1

```
df_food.head()
```

	produce_id	produce_name	produce_weight
0	00001	apples	0.5
1	00002	bananas	0.2
2	00003	carrots	0.3

DataFrame 2

```
df_sales.head()
```

	produce_id	units_sold
0	00001	12.0
1	00003	NaN
2	00004	2.0

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Left Join - Keep 1, Match 2

```
pd.merge(df_food, df_sales, how = 'left', on = 'produce_id')
```

	produce_id	produce_name	produce_weight	units_sold
0	00001	apples	0.5	12.0
1	00002	bananas	0.2	NaN
2	00003	carrots	0.3	NaN

Right Join - Keep 2, Match 1

```
pd.merge(df_food, df_sales, how = 'right', on = 'produce_id')
```

	produce_id	produce_name	produce_weight	units_sold
0	00001	apples	0.5	12.0
1	00003	carrots	0.3	NaN
2	00004	NaN	NaN	2.0

Inner Join - Keep Matches

```
pd.merge(df_food, df_sales, how = 'inner', on = 'produce_id')
```

	produce_id	produce_name	produce_weight	units_sold
0	00001	apples	0.5	12.0
1	00003	carrots	0.3	NaN

Outer Join - Keep Everything

```
pd.merge(df_food, df_sales, how = 'outer', on = 'produce_id')
```

	produce_id	produce_name	produce_weight	units_sold
0	00001	apples	0.5	12.0
1	00002	bananas	0.2	NaN
2	00003	carrots	0.3	NaN
3	00004	NaN	NaN	2.0

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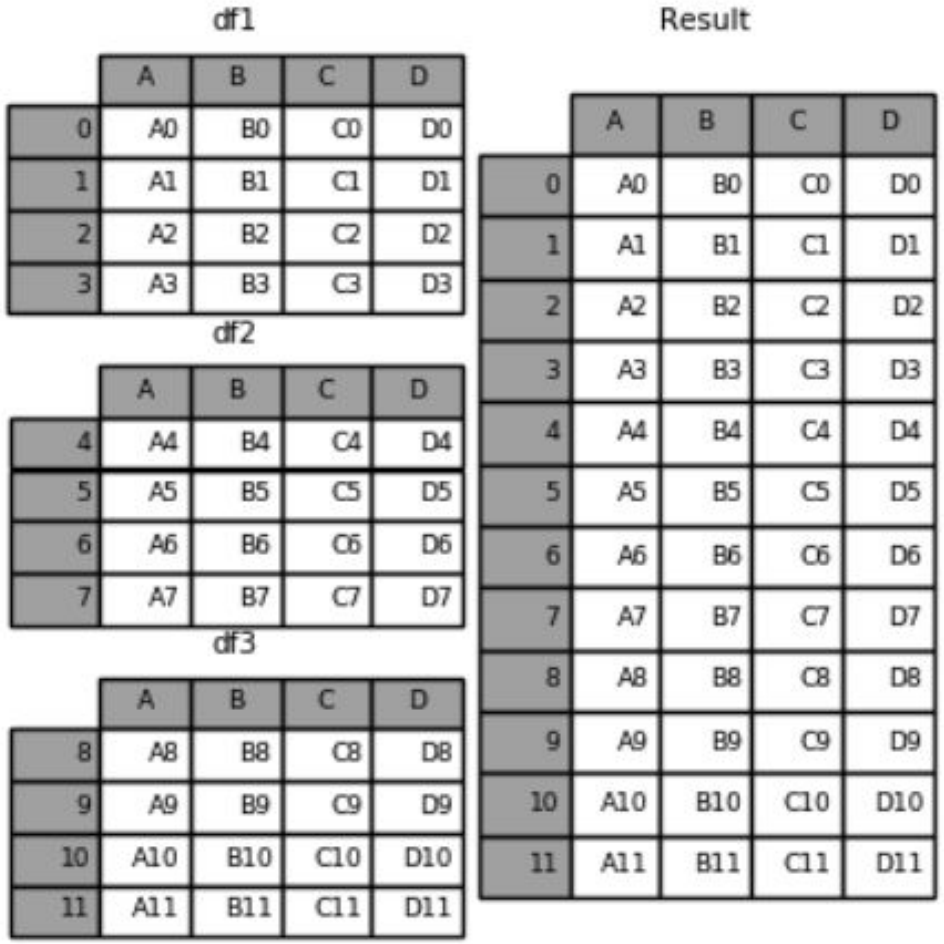
Concatenating DataFrames:

pd.concat(*[<df1>, <df2>, <df3>]*)



df1

	A	B	C	D
0	A0	B0	C0	D0
1	A1	B1	C1	D1
2	A2	B2	C2	D2
3	A3	B3	C3	D3

df2

	A	B	C	D
4	A4	B4	C4	D4
5	A5	B5	C5	D5
6	A6	B6	C6	D6
7	A7	B7	C7	D7

df3

	A	B	C	D
8	A8	B8	C8	D8
9	A9	B9	C9	D9
10	A10	B10	C10	D10
11	A11	B11	C11	D11

Result

	A	B	C	D
0	A0	B0	C0	D0
1	A1	B1	C1	D1
2	A2	B2	C2	D2
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5	A5	B5	C5	D5
6	A6	B6	C6	D6
7	A7	B7	C7	D7
8	A8	B8	C8	D8
9	A9	B9	C9	D9
10	A10	B10	C10	D10
11	A11	B11	C11	D11

- **Same columns**
- **Like pasting them together**

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Using groupby on a DataFrame:

df.groupby(*[col_1, col_2]*)

This will return a groupby object, to get back will need to do an aggregation function

df.groupby(*[col_1, col_2]*).agg('count')

Product_type	Retailer_type	Sale_ID	Retailer_country	Order_method_type	Product_line	Product	Year	Quarter	Revenue	Quantity
Binoculars	Department Store	808	808	808	808	808	801	801	801	801
	Direct Marketing	16	16	16	16	16	16	16	16	16
	Equipment Rental Store	15	15	15	15	15	15	15	15	15
	Eyewear Store	533	533	533	533	533	533	533	533	533
	Golf Shop	333	333	333	333	333	326	326	326	326
...	...	...	...	...	...	...	...	...	...	...
Woods	Direct Marketing	3	3	3	3	3	3	3	3	3
	Equipment Rental Store	36	36	36	36	36	34	34	34	34
	Golf Shop	808	808	808	808	808	804	804	804	804
	Sports Store	666	666	666	666	666	666	666	666	666
	Warehouse Store	8	8	8	8	8	8	8	8	8

Questions?