Pandas 3

28 October 2024 20:59

Agenda → (Introduction)

(Teaching)

- Introduction to IMDB use case
  - Merging `movies` & `directors` datasets
  - IMDB data exploration (Post-read)
- `apply()` } → Practically
- `groupby()` }
  - Group based Aggregation
  - Group based Filtering
  - Group based Apply

(#) v.v imp { 2 of my interviews }

Robut Jindal → Sr Data Scientist at Tech (Retail)

Civil Engineer → IISc Bangalore (Masters in D.S)

Mastercard AI Garage

Stock Street Global Advisors (Financial ML)

A.Manager at Indian Railways

University of Cambridge → (EP & Sustainable) Data Scientist

(6 months visit)

High Level

Primary key → movies (Table 1)

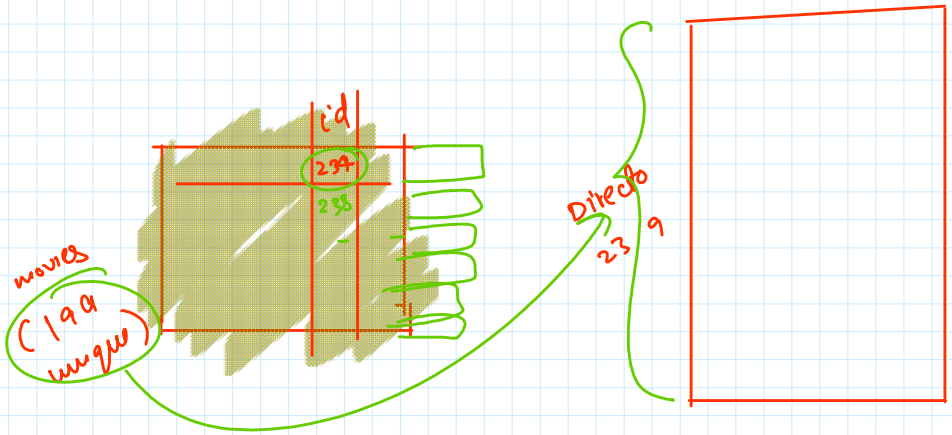
Movies ? → Foreign key

Code { Practice }

	Unnamed: 0	id	budget	popularity	revenue	title	vote_average	vote_count	director_id	year	month	day	Now	Gendi
0	0	43597	237000000	150	2787965087	Avatar	7.2	11800	4762	2009	Dec	Thursday		
1	1	43598	300000000	139	961000000	Pirates of the Caribbean: At World's End	6.9	4500	4763	2007	May	Saturday		
2	2	43599	245000000	107	880674609	Spectre	6.3	4466	4764	2015	Oct	Monday		
3	3	43600	250000000	112	1084939099	The Dark Knight Rises	7.6	9106	4765	2012	Jul	Monday		
4	5	43602	258000000	115	890871626	Spider-Man 3	5.9	3576	4767	2007	May	Tuesday		

Directors ? → director ID (Primary key in directors table)

	director_name	id	gender
0	James Cameron	4762	Male
1	Gore Verbinski	4763	Male
2	Sam Mendes	4764	Male
3	Christopher Nolan	4765	Male
4	Andrew Stanton	4766	Male



After Joining we get id_x , id_y

Notice the two strange id columns - `id_x` and `id_y`.

What do you think these newly created columns are?

Since the columns with name `id` are present in both the dataframes,

- `id_x` represents **id values from movie df**
- `id_y` represents **id values from directors df**

Notice the two strange id columns - `id_x` and `id_y`.

What do you think these newly created columns are?

Since the columns with name `id` are present in both the dataframes,

- `id_x` represents **id values from movie df**
- `id_y` represents **id values from directors df**

Do you think any column is redundant here and can be dropped?

- `id_y` is redundant as it is the same as `director_id`
- But we don't require the `director_id` any further.

So we can simply drop these features -

Apply Function in Pandas

	id_x	budget	popularity	revenue	title	vote_average	vote_count	year	month	day	director_name	gender
0	43597	237000000	150	2787965087	Avatar	7.2	11800	2009	Dec	Thursday	James Cameron	Male
1	43598	300000000	139	961000000	Pirates of the Caribbean: At World's End	6.9	4500	2007	May	Saturday	Gore Verbinski	Male
2	43599	245000000	107	880674609	Spectre	6.3	4466	2015	Oct	Monday	Sam Mendes	Male
3	43600	250000000	112	1084939099	The Dark Knight Rises	7.6	9106	2012	Jul	Monday	Christopher Nolan	Male
4	43602	258000000	115	890871626	Spider-Man 3	5.9	3576	2007	May	Tuesday	Sam Raimi	Male
...	...	...	...	...	...	...	...	...	...	...	...	...
1460	48363	0	3	321952	The Last Waltz	7.9	64	1978	May	Monday	Martin Scorsese	Male
1461	48370	27000	19	3151130	Clerks	7.4	755	1994	Sep	Tuesday	Kevin Smith	Male
1462	48375	0	7	0	Rampage	6.0	131	2009	Aug	Friday	Uwe Boll	Male
1463	48376	0	3	0	Slacker	6.4	77	1990	Jul	Friday	Richard Linklater	Male
1464	48395	220000	14	2040920	El Mariachi	6.6	238	1992	Sep	Friday	Robert Rodriguez	NaN

encoded: 0 0 0 0 1 1 1 0 0 0 1 1

Female

(Forget other Rows)

```
def encode(data):
    if data == "Male":
        return 0
    else:
        return 1
```

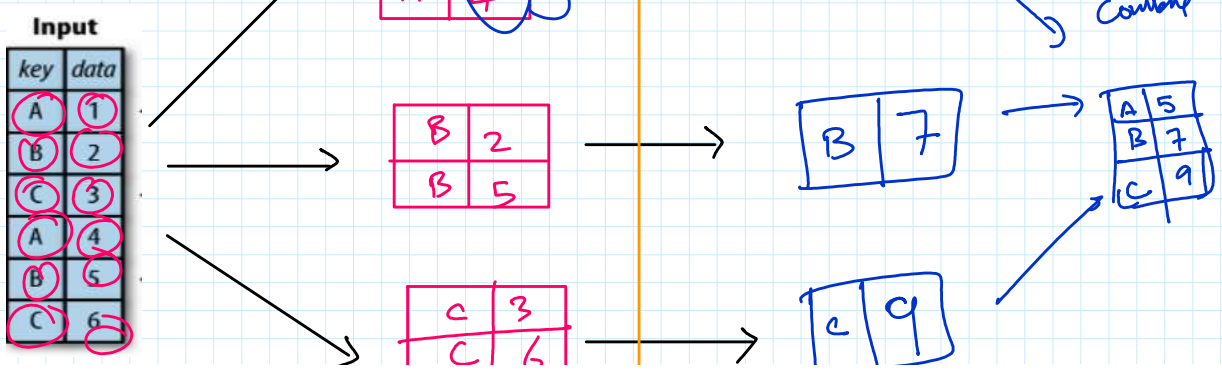
one entry

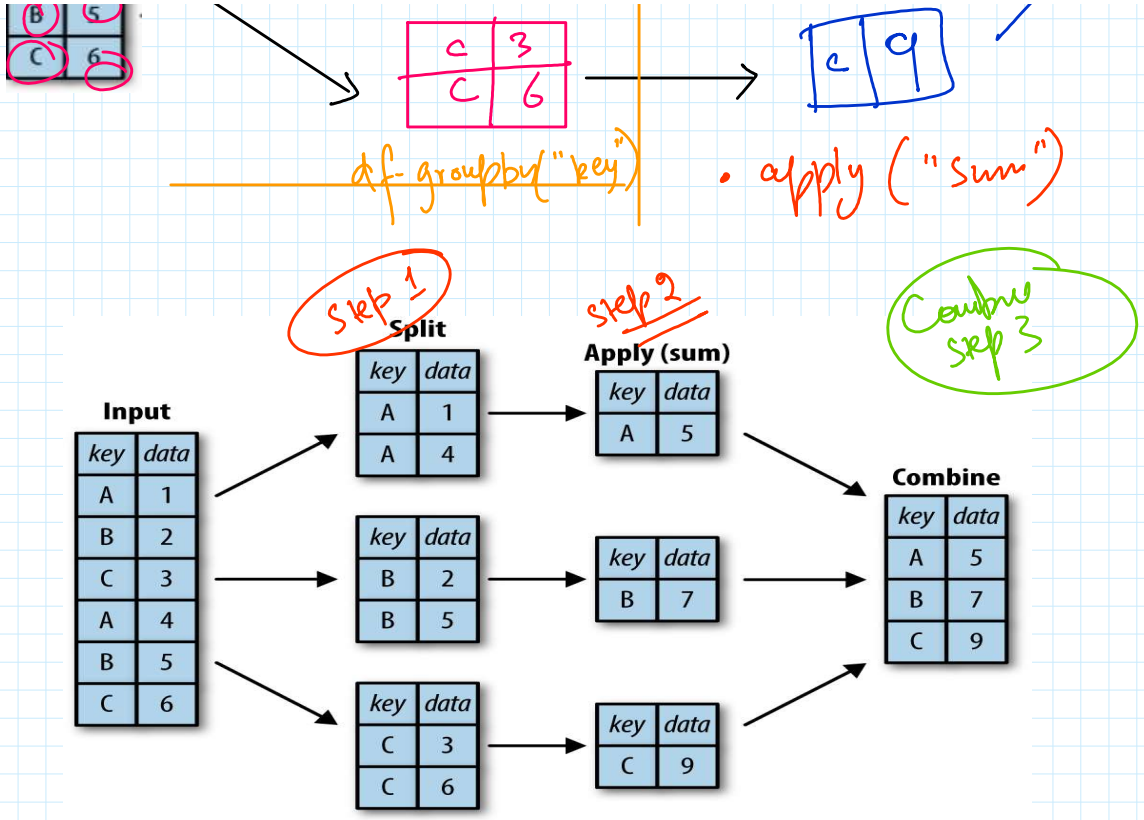
```
df["encode"] = data["gender"].apply(encode)
```

GROUP BY

```
df.groupby("key")
```

Split





1. **Split**: Breaking up and grouping a DataFrame depending on the value of the specified key.
2. **Apply**: Computing some function, usually an aggregate, transformation, or filtering, within the individual groups.
3. **Combine**: Merging the results of these operations into an output array.

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5 mins ⇒ 22:09 (10:09 PM)

Quiz Ended!

Given a dataframe of employee rating info `(emp_id, monthly_rating)`. How will you calculate the average rating of each employee?

56 users have participated

A	data.groupby('emp_id')	4%
B	data.groupby('monthly_rating')	2%
C ✓	data.groupby('emp_id').mean()	52%
D	data.groupby('monthly_rating').mean()	43%

directors | children

df.groupby(["direct","child"]).agg([fn1, fn2 ...])

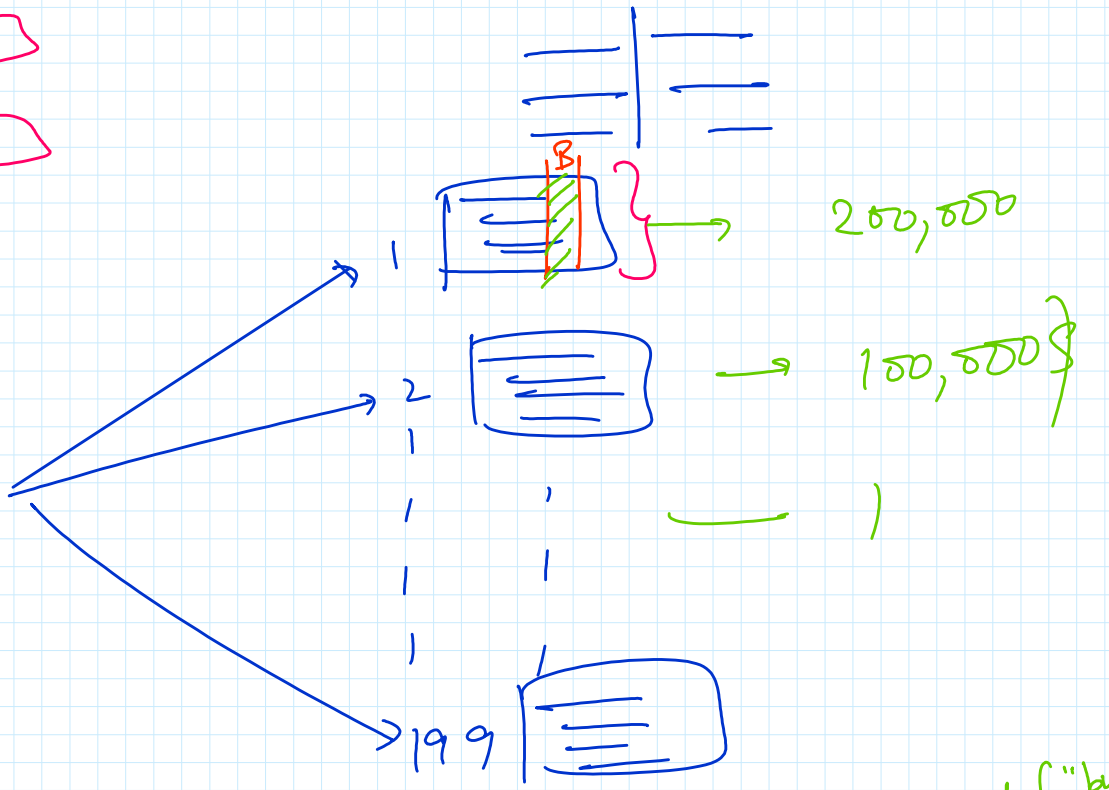
// .agg(["min","max"])

// .agg(["min", "max"])

Group Based filtering

high Budget Director → (director whose at least one movie has budget > 100 M

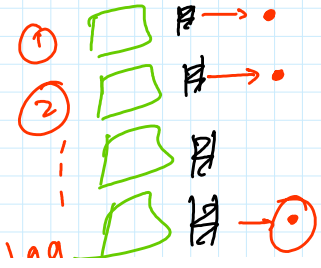
```
data.groupby("director")["budget"].max()
```



group["budget"]

Here "groups will be filtered"

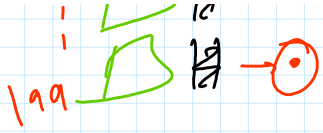
```
data.groupby("director_name").filter(lambda x : x["budget"].max() >= 100 Million)
```

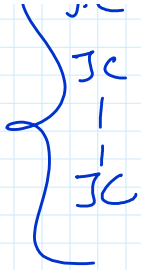


J.C
J.C

Budget
100M
200M
0

keep the





keep the "group"

data [data.budget > 100 M]

(Group Based Apply)

Let's say, we want to filter the risky movies whose budget was even higher than the average revenue of the director from his other movies.

x[risky] = x["budget"] − x["revenue"].mean() > 0

df.apply → S1 → write fn for a single row

S2 → use df.apply(fn)

group based apply → S1 → write a fn for one group

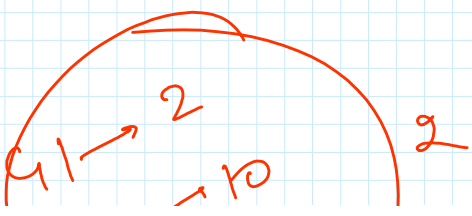
S2 → df.groupby(" ").apply(fn)

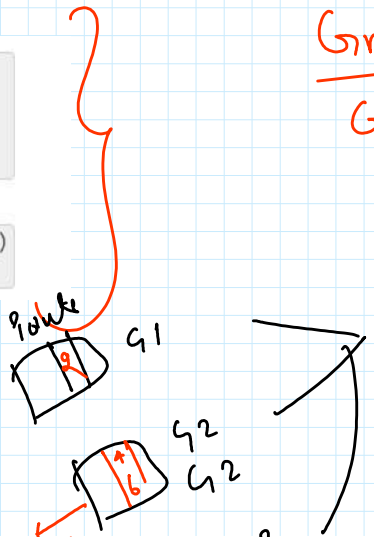
```
import pandas as pd
data = {'Group': ['G1', 'G2', 'G2', 'G3', 'G3', 'G3'],
        'Points': [2, 4, 6, 8, 10, 12]}
df = pd.DataFrame(data)
```

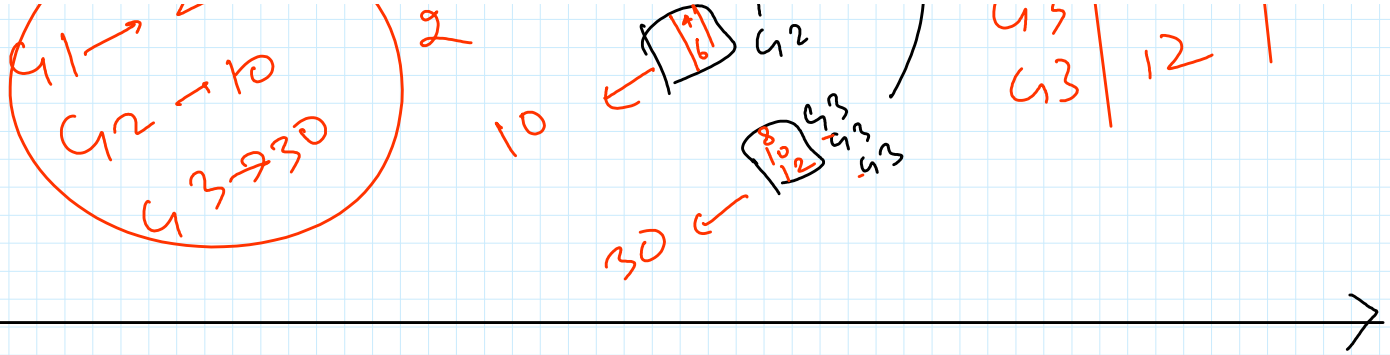
What will be output of the code given below?

```
result = df.groupby('Group')['Points'].apply(lambda x: x.sum())
print(result)
```

Group	Points
G1	2
G2	4
G2	6
G3	8
G3	10
G3	12







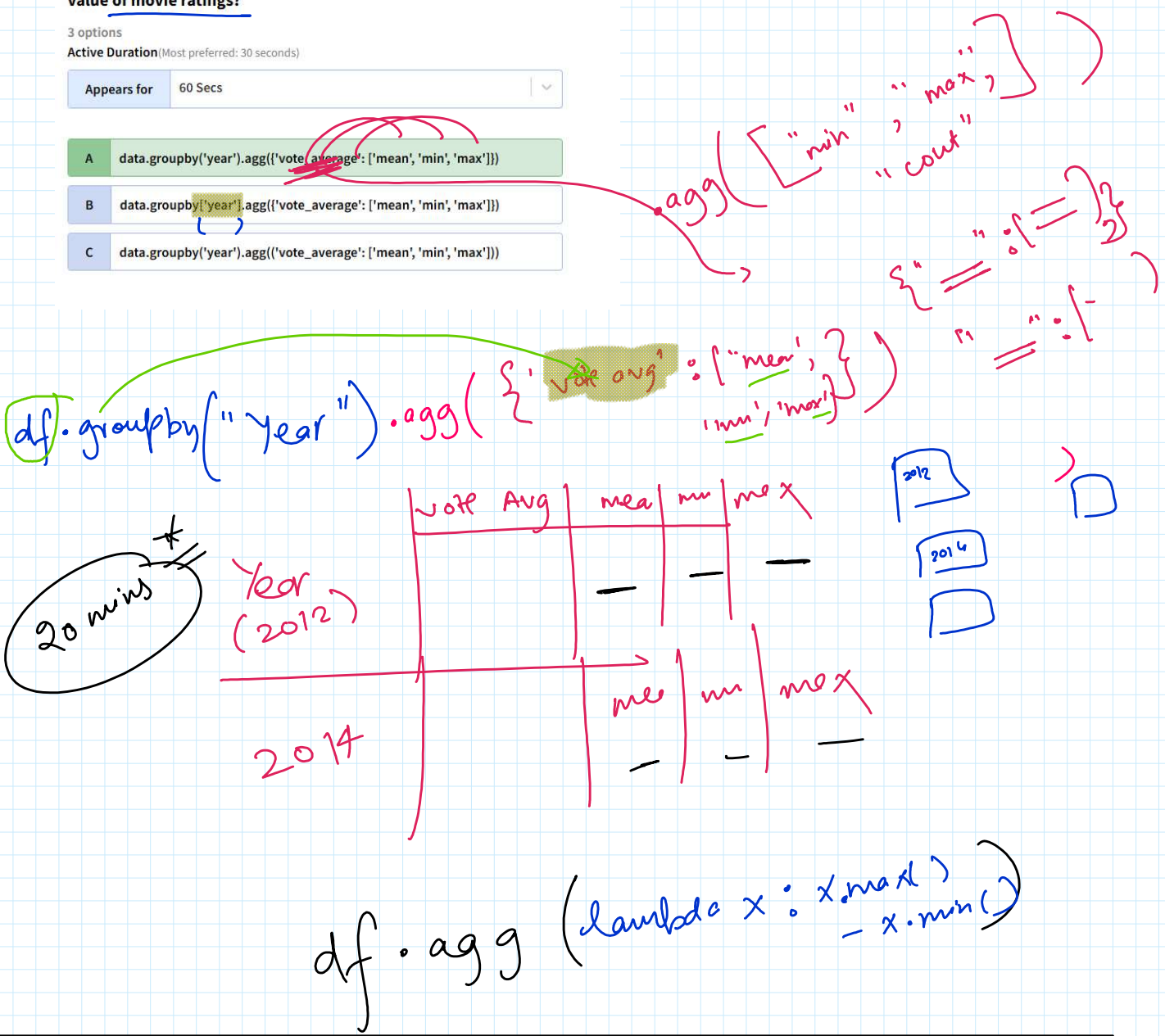
For each year, how you will get the average, lowest, and highest value of movie ratings?

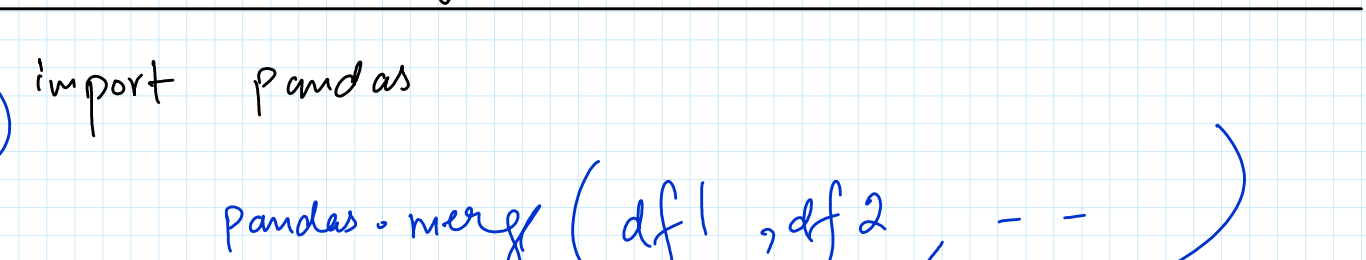
3 options

Active Duration (Most preferred: 30 seconds)

Appears for	60 Secs

A	data.groupby('year').agg({'vote_average': ['mean', 'min', 'max']})
B	data.groupby['year'].agg({'vote_average': ['mean', 'min', 'max']})
C	data.groupby('year').agg(('vote_average': ['mean', 'min', 'max']))





II

df1.merge(df2, on = '', how = 'left')