In [ ]:

```
import pandas as pd

### Python Fundamentals ###

# read .cvs files
article_df = pd.read_csv('articleInfo.csv')
author_df = pd.read_csv('authorInfo.csv')
```

In [ ]:

```
full_df = pd.merge(article_df, author_df, how='left', on='Article No.')
full_df = full_df.fillna(0, downcast='infer')
```

In [ ]:

```
# Plot the yearly_publication figure, in which the x-axis is the year, the y-ax
# https://stackoverflow.com/questions/22219004/how-to-group-dataframe-rows-into

# could use nunique instead of author name list thing
full_df1 = full_df.groupby(['Article No.', 'Year'])['Author Name'].apply(list).
yearly_publication_counts = full_df1['Year'].value_counts().sort_index('index')
yearly_publication_df = pd.DataFrame(yearly_publication_counts)
yearly_publication_df = yearly_publication_df.reset_index()
yearly_publication_df.columns = ['Year', 'Number of articles']
yearly_publication_df
```

```
/var/folders/5k/sjwwd0rj5cx9swsd9y1mfdzm0000gn/T/ipykernel_6383/3351451387.py:
6: FutureWarning: In a future version of pandas all arguments of Series.sort_i
ndex will be keyword-only.
  yearly_publication_counts = full_df1['Year'].value_counts().sort_index('inde
x')
```

Out[ ]:

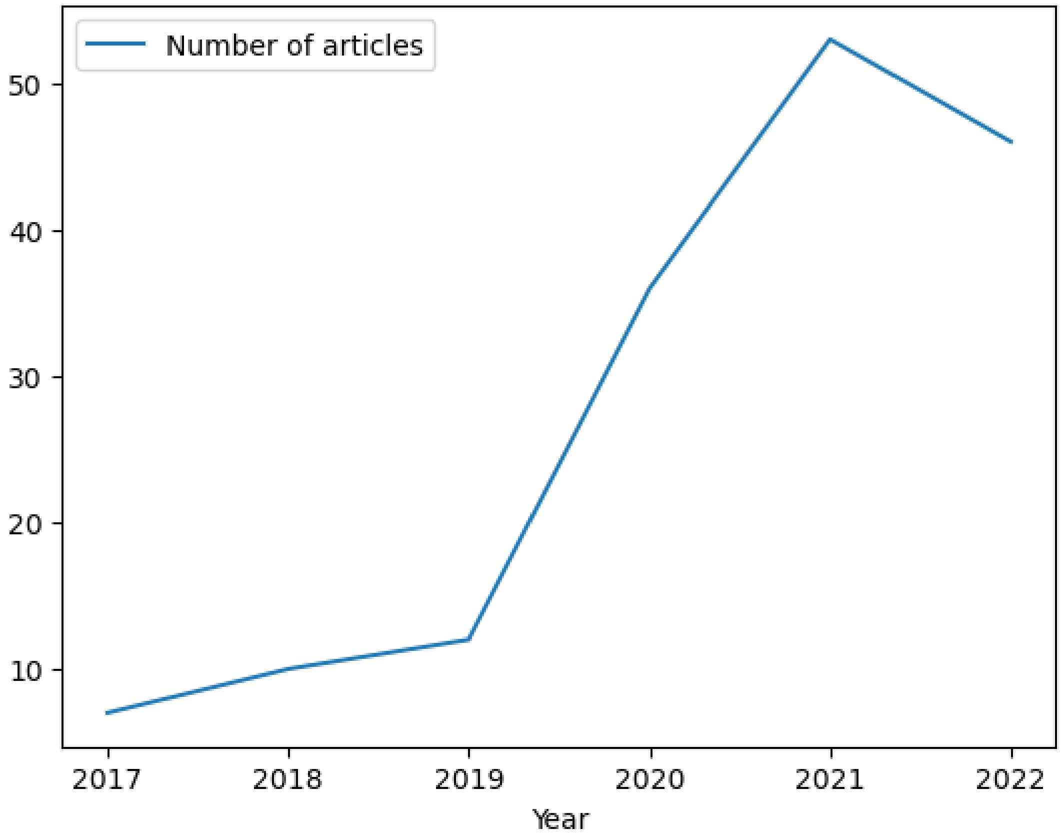
	Year	Number of articles
0	2017	7
1	2018	10
2	2019	12
3	2020	36
4	2021	53
5	2022	46

In [ ]:

```
# Syntax for visualization plot
yearly_publication_df.plot(x='Year', y='Number of articles', kind='line')
```

Out[ ]:

```
<AxesSubplot: xlabel='Year'>
```



In [ ]:

```
# Plot the yearly_citation figure, in which the x-axis is the year, the y-axis

yearly_citation_counts = full_df.groupby(['Year']).sum()['Citation'].sort_index
yearly_citation_df = pd.DataFrame(yearly_citation_counts)
yearly_citation_df = yearly_citation_df.reset_index()
yearly_citation_df.columns = ['Year', 'Number of citations']
yearly_citation_df
```

```
/var/folders/5k/sjwwd0rj5cx9swsd9y1mfdzm0000gn/T/ipykernel_6383/1624899623.py:
3: FutureWarning: In a future version of pandas all arguments of Series.sort_i
ndex will be keyword-only.
  yearly_citation_counts = full_df.groupby(['Year']).sum()['Citation'].sort_in
dex('index')
```

Out[ ]:

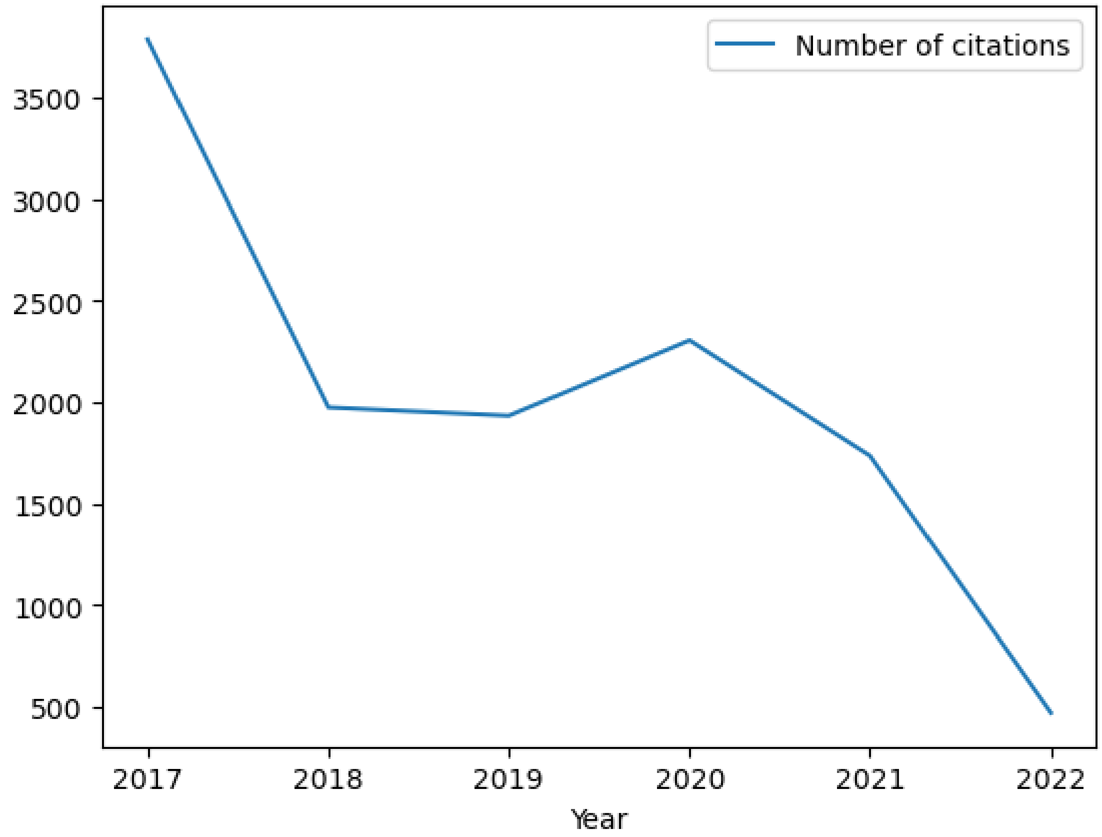
	Year	Number of citations
0	2017	3788
1	2018	1974
2	2019	1933
3	2020	2305
4	2021	1735
5	2022	469

In [ ]:

```
yearly_citation_df.plot(x='Year', y='Number of citations', kind='line')
```

Out[ ]:

```
<AxesSubplot: xlabel='Year'>
```



In [ ]:

```
# Plot the figure of the number of publications across countries. You may use a

publication_country_counts = full_df.groupby(['Country']).count()
publication_country_df = pd.DataFrame(publication_country_counts).iloc[:, 0:1]
publication_country_df = publication_country_df.reset_index()
publication_country_df.columns = ['Country', 'Number of countries']
publication_country_df.at[0,'Country'] = 'No country'
publication_country_df
```

Out[ ]:

	Country	Number of countries
0	No country	85
1	Australia	13
2	Bristol	1
3	Canada	12
4	Chian	1
5	Chile	3
6	Chile	6
7	China	34
8	Cyprus	7
9	Czech Republic	15
10	Denamrk	8
11	Denmark	5
12	France	7
13	Germany	26
14	Greece	5
15	Hong Kong	8
16	India	3
17	Ireland	17
18	Israel	1
19	Italy	19
20	Korea	3
21	Kyrgyzstan	1
22	Liechtenstein	2
23	Malaysia	6
24	Mexico	3
25	New Zealand	6
26	Norway	2
27	Pakistan	6
28	Palestine	1
29	Russia	5
30	Slovakia	7
31	South Africa	17
32	Spain	9
33	Spain	10
34	Switzerland	5

	Country	Number of countries
35	Taiwan	13
36	USA	62
37	Ukraine	6
38	United Arab Emirates	1
39	United Kingdom	30

In [ ]:

```
# What are the top 5 institutions that have the most published articles in this

top_institution_by_topic_counts = full_df.groupby(['Author Affiliation']).count
top_instutution_by_topic_df = pd.DataFrame(top_institution_by_topic_counts).ilo
top_instutution_by_topic_df = top_instutution_by_topic_df.reset_index()
top_instutution_by_topic_df.columns = ['Institution', 'Number of articles publi
top_instutution_by_topic_df.sort_values(by='Number of articles published', asce
top_instutution_by_topic_df = top_instutution_by_topic_df.reset_index(drop=True
top_instutution_by_topic_df.head()
```

Out[ ]:

	Institution	Number of articles published
0	University of the Western Cape	17
1	Masaryk University	12
2	University College Cork	11
3	Intel Corporation	11
4	The Chinese University of Hong Kong	8

In [ ]:

```
# Who are the top 5 researchers that have the most h-index in this area?

top_hindex_df = author_df.iloc[:, [0,-1]].fillna(0, downcast='infer').sort_valu
top_hindex_df.head()
```

Out[ ]:

	Author Name	h-index
0	Ulrich Trautwein	95
1	Nicolas Molinari	63
2	George S. Athwal	59
3	Maria Luisa Lorusso	33
4	Vicente A. González	33