

# **Cloud Computing**

## **Assignment 2**

**Department: Cybersecurity**

**Presented by:**

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1. I Downloaded the image and create directory named Dockerfile.

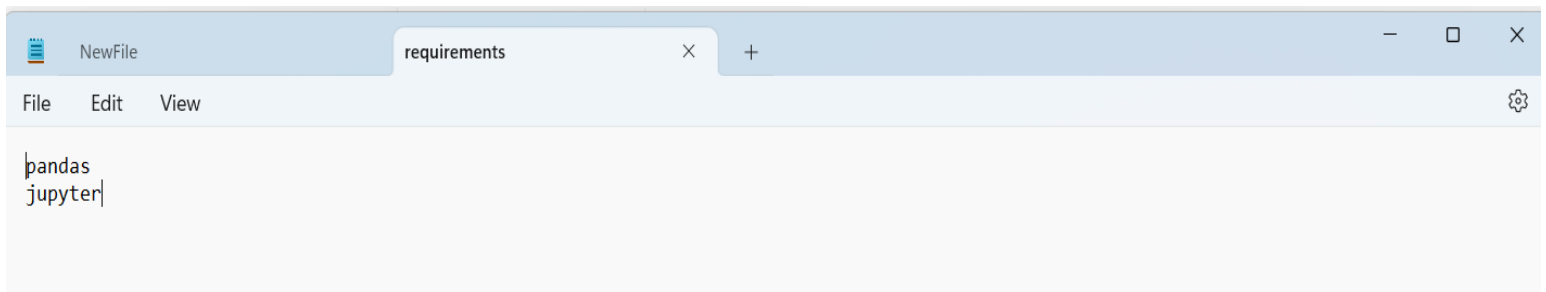
2. I Pulled the image from docker hub:

**docker pull jupyter/datascience-notebook**

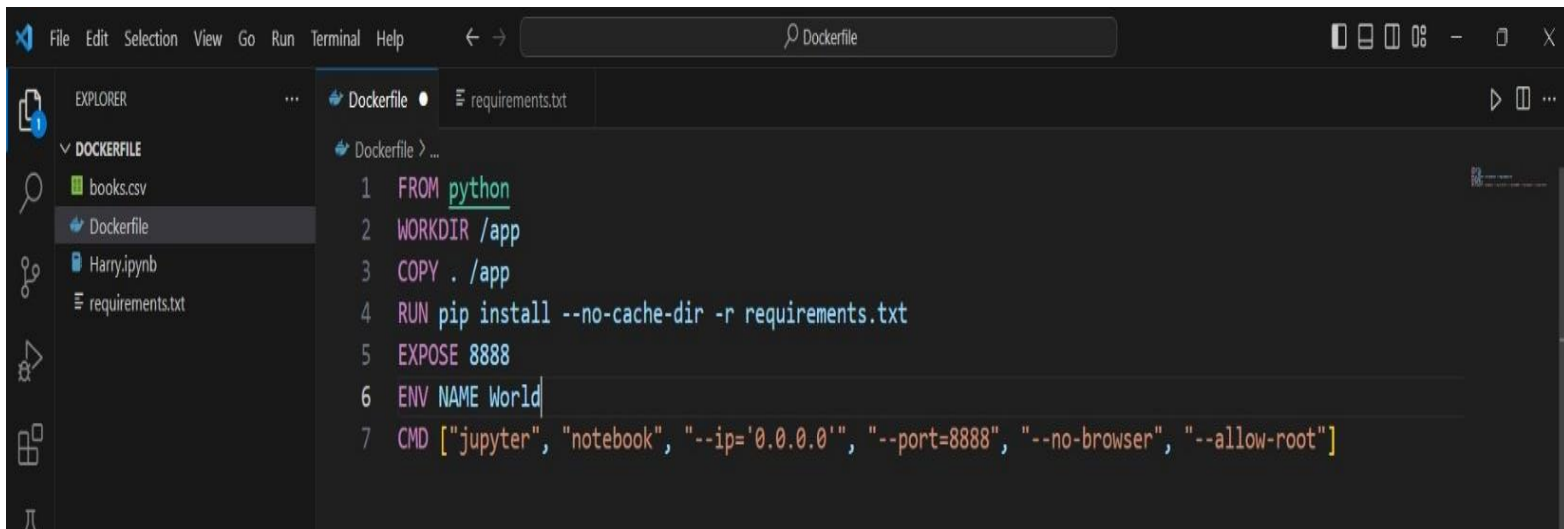
```
C:\Users\Lenovo>docker pull jupyter/datascience-notebook
Using default tag: latest
latest: Pulling from jupyter/datascience-notebook
Digest: sha256:476c6e673e7d5d8b5059f8680b1c6a988942a79263da651bf302dc696ab311f2
Status: Image is up to date for jupyter/datascience-notebook:latest
docker.io/jupyter/datascience-notebook:latest

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview jupyter/datascience-notebook
```

3. created text file name requirements:



4. I wrote Dockerfile in vs code:

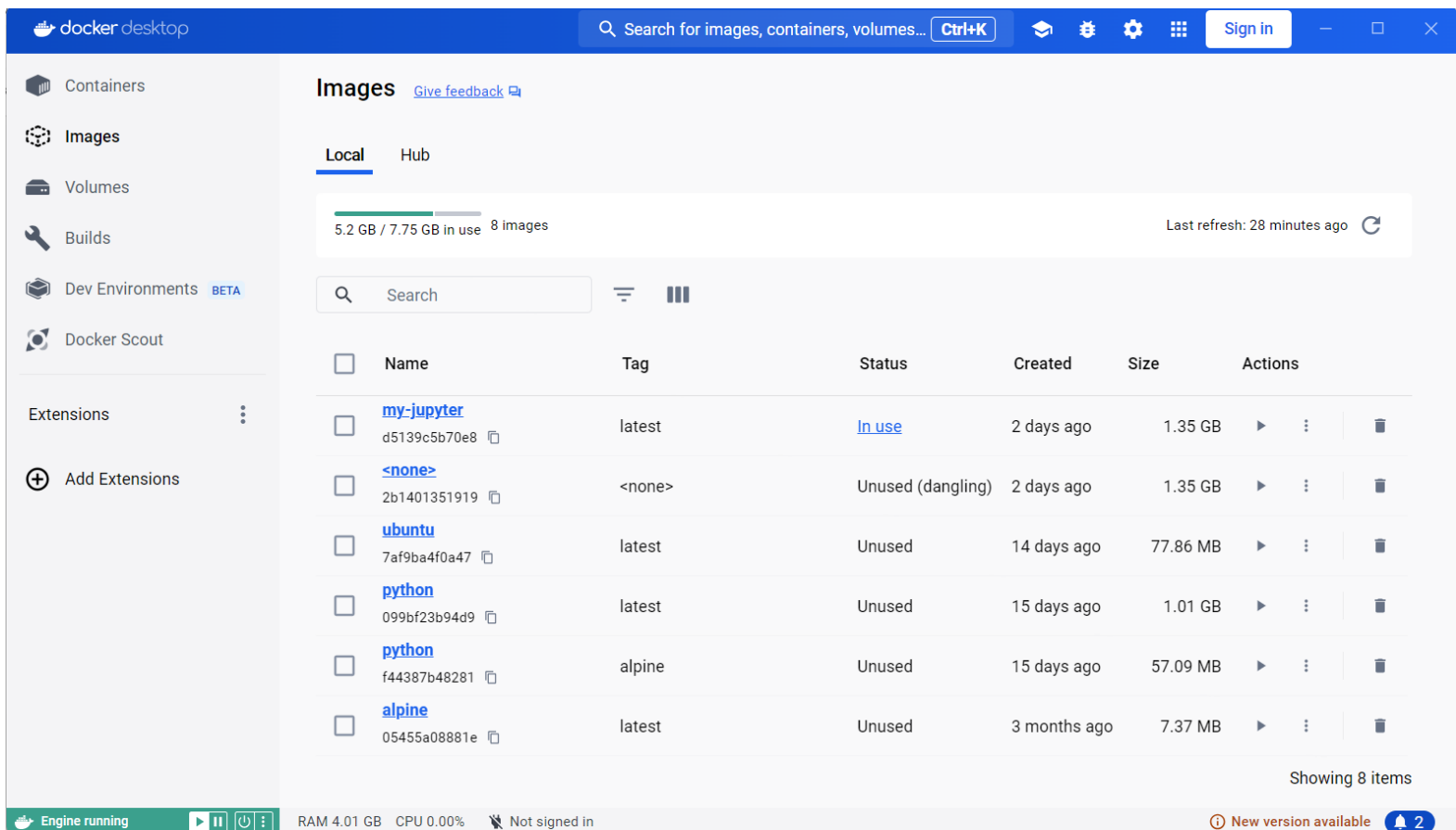


## 5. Build the image:

**docker build -t my-jupyter**

```
Command Prompt - docker r X + v
C:\Dockerfile>docker build -t my-jupyter .
2024/04/22 18:11:53 http2: server: error reading preface from client //./pipe/docker_engine: file has already been closed
[+] Building 232.4s (9/9) FINISHED
=> [internal] load build definition from Dockerfile                                docker:default
=> => transferring dockerfile: 260B                                              0.0s
=> [internal] load metadata for docker.io/library/python:latest                 0.0s
=> [internal] load .dockerignore                                                 0.0s
=> => transferring context: 2B                                                  0.0s
=> [1/4] FROM docker.io/library/python:latest                                  0.0s
=> [internal] load build context                                                0.0s
=> => transferring context: 327B                                               0.0s
=> CACHED [2/4] WORKDIR /app                                                    0.0s
=> [3/4] COPY . /app                                                            0.1s
=> [4/4] RUN pip install --no-cache-dir -r requirements.txt                    229.9s
=> exporting to image                                                            2.2s
=> => exporting layers                                                         2.1s
=> => writing image sha256:d5139c5b70e8c50cef4fdd3350d546c7fd928b0ec9df41a1e14a4a86abbd3125 0.0s
=> => naming to docker.io/library/my-jupyter                                  0.0s

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview
```



## 6. Run the container and give it the port:

**docker run -p 8888:8888 my-jupyter**

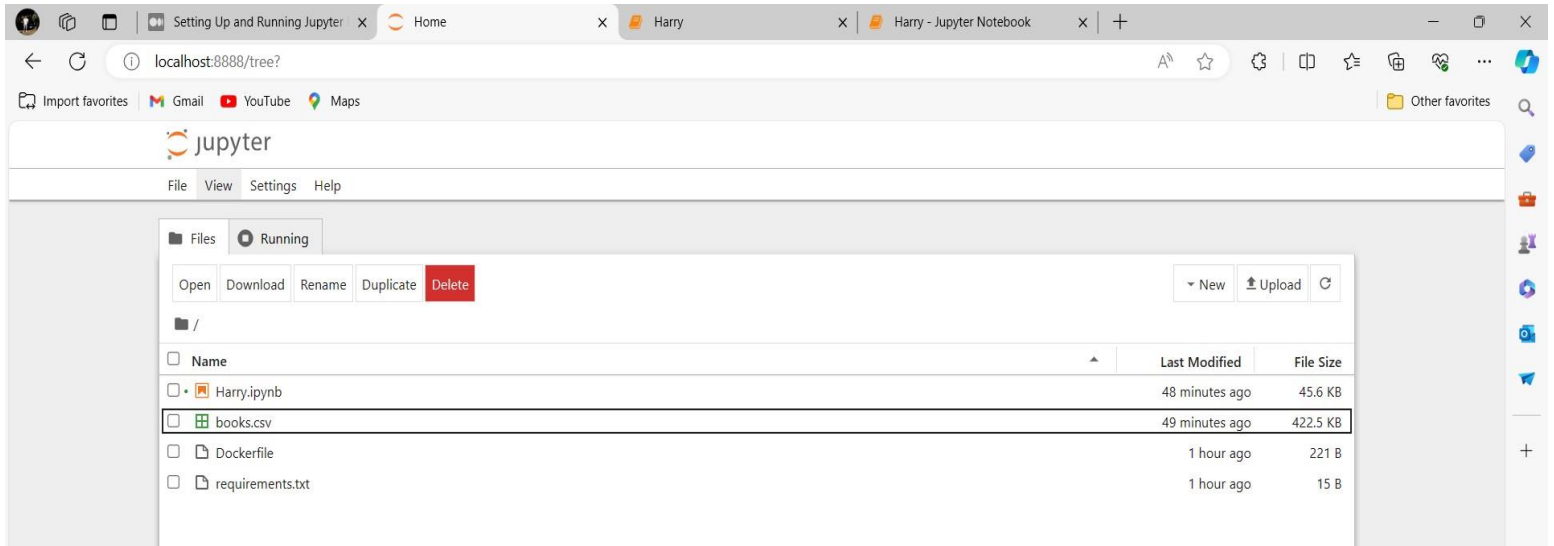
```
Command Prompt - docker r X + v
C:\Dockerfile>docker run -p 8888:8888 my-jupyter
[I 2024-04-22 16:16:49.730 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2024-04-22 16:16:49.736 ServerApp] jupyter_server_terminals | extension was successfully linked.
[I 2024-04-22 16:16:49.742 ServerApp] jupyterlab | extension was successfully linked.
[I 2024-04-22 16:16:49.748 ServerApp] notebook | extension was successfully linked.
[I 2024-04-22 16:16:49.750 ServerApp] Writing Jupyter server cookie secret to /root/.local/share/jupyter/runtime/jupyter_cookie_secret
[I 2024-04-22 16:16:50.039 ServerApp] notebook_shim | extension was successfully linked.
[I 2024-04-22 16:16:50.054 ServerApp] notebook_shim | extension was successfully loaded.
[I 2024-04-22 16:16:50.056 ServerApp] jupyter_lsp | extension was successfully loaded.
[I 2024-04-22 16:16:50.057 ServerApp] jupyter_server_terminals | extension was successfully loaded.
[I 2024-04-22 16:16:50.059 LabApp] JupyterLab extension loaded from /usr/local/lib/python3.12/site-packages/jupyterlab
[I 2024-04-22 16:16:50.059 LabApp] JupyterLab application directory is /usr/local/share/jupyter/lab
[I 2024-04-22 16:16:50.060 LabApp] Extension Manager is 'pypi'.
[I 2024-04-22 16:16:50.088 ServerApp] jupyterlab | extension was successfully loaded.
[I 2024-04-22 16:16:50.091 ServerApp] notebook | extension was successfully loaded.
[I 2024-04-22 16:16:50.092 ServerApp] Serving notebooks from local directory: /app
[I 2024-04-22 16:16:50.092 ServerApp] Jupyter Server 2.14.0 is running at:
[I 2024-04-22 16:16:50.092 ServerApp] http://955edd31a0f1:8888/tree?token=ca735764f6061ad5494d5179f6255ca2eefc7fdea3dfafff
[I 2024-04-22 16:16:50.092 ServerApp] http://127.0.0.1:8888/tree?token=ca735764f6061ad5494d5179f6255ca2eefc7fdea3dfafff
[I 2024-04-22 16:16:50.092 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2024-04-22 16:16:50.095 ServerApp]

To access the server, open this file in a browser:
file:///root/.local/share/jupyter/runtime/jpserver-1-open.html
Or copy and paste one of these URLs:
http://955edd31a0f1:8888/tree?token=ca735764f6061ad5494d5179f6255ca2eefc7fdea3dfafff
http://127.0.0.1:8888/tree?token=ca735764f6061ad5494d5179f6255ca2eefc7fdea3dfafff
[I 2024-04-22 16:16:50.110 ServerApp] Skipped non-installed server(s): bash-language-server, dockerfile-language-server-nodejs, javascript-typescript-langse
rver, jedi-language-server, julia-language-server, pyright, python-language-server, python-lsp-server, r-languageserver, sql-language-server, texlab, typesc
ript-language-server, unified-language-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-json-languageserver-bin, yaml-language-
server
[W 2024-04-22 16:17:41.476 ServerApp] Clearing invalid/expired login cookie username-localhost-8888
[I 2024-04-22 16:17:41.477 JupyterNotebookApp] 302 GET /tree?token=[secret] (@172.17.0.1) 2.30ms
[I 2024-04-22 16:18:22.613 ServerApp] 302 GET / (@172.17.0.1) 0.55ms
[I 2024-04-22 16:18:22.621 JupyterNotebookApp] 302 GET /tree? (@172.17.0.1) 0.83ms
[I 2024-04-22 16:20:18.465 ServerApp] Interrupted...

Command Prompt - docker r X + v
[I 2024-04-22 16:26:47.984 LabApp] JupyterLab application directory is /usr/local/share/jupyter/lab
[I 2024-04-22 16:26:47.985 LabApp] Extension Manager is 'pypi'.
[I 2024-04-22 16:26:48.042 ServerApp] jupyterlab | extension was successfully loaded.
[I 2024-04-22 16:26:48.048 ServerApp] notebook | extension was successfully loaded.
[I 2024-04-22 16:26:48.049 ServerApp] Serving notebooks from local directory: /app
[I 2024-04-22 16:26:48.049 ServerApp] Jupyter Server 2.14.0 is running at:
[I 2024-04-22 16:26:48.049 ServerApp] http://3c1c01bd8558:8888/tree?token=f33476d4bc5e087a52e74da5851c8ffea0b8fc03f1ba0aac
[I 2024-04-22 16:26:48.049 ServerApp] http://127.0.0.1:8888/tree?token=f33476d4bc5e087a52e74da5851c8ffea0b8fc03f1ba0aac
[I 2024-04-22 16:26:48.049 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2024-04-22 16:26:48.055 ServerApp]

To access the server, open this file in a browser:
file:///root/.local/share/jupyter/runtime/jpserver-1-open.html
Or copy and paste one of these URLs:
http://3c1c01bd8558:8888/tree?token=f33476d4bc5e087a52e74da5851c8ffea0b8fc03f1ba0aac
http://127.0.0.1:8888/tree?token=f33476d4bc5e087a52e74da5851c8ffea0b8fc03f1ba0aac
[I 2024-04-22 16:26:48.091 ServerApp] Skipped non-installed server(s): bash-language-server, dockerfile-language-server-nodejs, javascript-typescript-langse
rver, jedi-language-server, julia-language-server, pyright, python-language-server, python-lsp-server, r-languageserver, sql-language-server, texlab, typesc
ript-language-server, unified-language-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-json-languageserver-bin, yaml-language-
server
[I 2024-04-22 16:26:52.193 ServerApp] 302 GET / (@172.17.0.1) 0.60ms
[I 2024-04-22 16:26:52.203 JupyterNotebookApp] 302 GET /tree? (@172.17.0.1) 1.31ms
[I 2024-04-22 16:26:52.709 ServerApp] 302 GET / (@172.17.0.1) 1.13ms
[I 2024-04-22 16:26:52.715 JupyterNotebookApp] 302 GET /tree? (@172.17.0.1) 0.86ms
[I 2024-04-22 16:27:23.056 ServerApp] User d0e4bc0eabfb4dd3b2516de9a6ddb804 logged in.
[I 2024-04-22 16:27:23.057 ServerApp] 302 POST /login?next=%2Ftree%3F (d0e4bc0eabfb4dd3b2516de9a6ddb804@172.17.0.1) 44.74ms
[I 2024-04-22 16:29:50.405 ServerApp] Writing notebook-signing key to /root/.local/share/jupyter/notebook_secret
[W 2024-04-22 16:29:50.417 ServerApp] Notebook Harry.ipynb is not trusted
[W 2024-04-22 16:29:51.346 ServerApp] Notebook Harry.ipynb is not trusted
[I 2024-04-22 16:29:51.688 ServerApp] Kernel started: 8b4fa70e-8954-42ef-944f-aede089b0157
[I 2024-04-22 16:29:52.410 ServerApp] Connecting to kernel 8b4fa70e-8954-42ef-944f-aede089b0157.
[I 2024-04-22 16:29:52.420 ServerApp] Connecting to kernel 8b4fa70e-8954-42ef-944f-aede089b0157.
[I 2024-04-22 16:29:52.436 ServerApp] Connecting to kernel 8b4fa70e-8954-42ef-944f-aede089b0157.
[I 2024-04-22 16:29:52.964 ServerApp] Connecting to kernel 8b4fa70e-8954-42ef-944f-aede089b0157.
[I 2024-04-22 16:30:56.479 ServerApp] Uploading file to /archive.zip
[W 2024-04-22 16:31:06.471 ServerApp] delete /archive.zip
[I 2024-04-22 16:31:52.031 ServerApp] Saving file at /Harry.ipynb
[W 2024-04-22 16:31:52.032 ServerApp] Notebook Harry.ipynb is not trusted
[I 2024-04-22 16:32:25.843 ServerApp] Uploading file to /books.csv
[I 2024-04-22 16:33:52.977 ServerApp] Saving file at /Harry.ipynb
```

## 7. open my jupyter notebook and upload the csv :



## 8. My code:

```
[31]: import pandas as pd

[32]: data=pd.read_csv("books.csv")

[33]: data=data[data.columns.drop(["isbn","isbn13","image_url","small_image_url"])]
print(data.info())
print("."*50)
print(data.isnull().sum())

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1354 entries, 0 to 1353
Data columns (total 19 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   book_id                               1354 non-null   int64
1   goodreads_book_id                     1354 non-null   int64
2   best_book_id                           1354 non-null   int64
3   work_id                               1354 non-null   int64
4   books_count                           1354 non-null   int64
5   authors                               1354 non-null   object
6   original_publication_year              1351 non-null   float64
7   original_title                         1302 non-null   object
8   title                                 1354 non-null   object
9   language_code                         1245 non-null   object
10  average_rating                         1354 non-null   float64
11  ratings_count                          1354 non-null   int64
12  work_ratings_count                     1354 non-null   int64
13  work_text_reviews_count                1354 non-null   int64
14  ratings_1                             1354 non-null   int64
15  ratings_2                             1354 non-null   int64
16  ratings_3                             1354 non-null   int64
17  ratings_4                             1354 non-null   int64
```



```

15 ratings_2 1354 non-null int64
16 ratings_3 1354 non-null int64
17 ratings_4 1354 non-null int64
18 ratings_5 1354 non-null int64
dtypes: float64(2), int64(13), object(4)
memory usage: 201.1+ KB
None
.....
book_id 0
goodreads_book_id 0
best_book_id 0
work_id 0
books_count 0
authors 0
original_publication_year 3
original_title 52
title 0
language_code 109
average_rating 0
ratings_count 0
work_ratings_count 0
work_text_reviews_count 0
ratings_1 0
ratings_2 0
ratings_3 0
ratings_4 0
ratings_5 0
dtype: int64

```

```

[34]: dataWithoutNullRows=data.dropna()
print(data.shape)
print(dataWithoutNullRows.shape)

(1354, 19)
(1197, 19)

```

```

[35]: dataHarryWithNulls=data[data["title"].str.contains("Harry Potter",case=False)]
dataHarryWithNulls

```

[35]:

	book_id	goodreads_book_id	best_book_id	work_id	books_count	authors	original_publication_year	original_title	title	language_code	average_rating	
	1	2	3	3	4640799	491	J.K. Rowling, Mary GrandPré	1997.0	Harry Potter and the Philosopher's Stone	Harry Potter and the Sorcerer's Stone (Harry P...	eng	4.44
	6	18	5	5	2402163	376	J.K. Rowling, Mary GrandPré, Rufus Beck	1999.0	Harry Potter and the Prisoner of Azkaban	Harry Potter and the Prisoner of Azkaban (Harr...	eng	4.53
	8	21	2	2	2809203	307	J.K. Rowling, Mary GrandPré	2003.0	Harry Potter and the Order of the Phoenix	Harry Potter and the Order of the Phoenix (Har...	eng	4.46
	9	23	15881	15881	6231171	398	J.K. Rowling, Mary GrandPré	1998.0	Harry Potter and the Chamber of Secrets	Harry Potter and the Chamber of Secrets (Harry...	eng	4.37
	10	24	6	6	3046572	332	J.K. Rowling, Mary GrandPré	2000.0	Harry Potter and the Goblet of Fire	Harry Potter and the Goblet of Fire (Harry Pot...	eng	4.53
	11	25	136251	136251	2963218	263	J.K. Rowling, Mary GrandPré	2007.0	Harry Potter and the Deathly Hallows	Harry Potter and the Deathly Hallows (Harry Po...	eng	4.61
	12	27	1	1	41335427	275	J.K. Rowling, Mary GrandPré	2005.0	Harry Potter and the Half-Blood Prince	Harry Potter and the Half-Blood Prince (Harry ...	eng	4.54
	96	422	862041	862041	2962492	76	J.K. Rowling	1998.0	Complete Harry Potter Boxed Set	Harry Potter Boxset (Harry Potter, #1-7)	eng	4.74
	613	3753	10	10	21457570	6	J.K. Rowling	2005.0	Harry Potter Collection (Harry Potter, #1-6)	Harry Potter Collection (Harry Potter, #1-6)	eng	4.73
	1036	7018	483445	483445	471792	42	David Colbert	2001.0	The Magical Worlds of Harry Potter: A Treasury...	The Magical Worlds of Harry Potter: A Treasury...	eng	3.96
	1266	9048	2002	2002	8621948	5	J.K. Rowling	2001.0	NaN	Harry Potter Schoolbooks Box Set: Two	eng	4.40

[36]: dataHarryWithoutNulls=dataWithoutNullRows[dataWithoutNullRows["original\_title"].str.contains("Harry Potter",case=False)]

dataHarryWithoutNulls

[36]:	book_id	goodreads_book_id	best_book_id	work_id	books_count	authors	original_publication_year	original_title	title	language_code	average_rating	r
	1	2	3	3	4640799	491	J.K. Rowling, Mary GrandPré	1997.0	Harry Potter and the Philosopher's Stone	Harry Potter and the Sorcerer's Stone (Harry P...	eng	4.44
	6	18	5	5	2402163	376	J.K. Rowling, Mary GrandPré, Rufus Beck	1999.0	Harry Potter and the Prisoner of Azkaban	Harry Potter and the Prisoner of Azkaban (Harr...	eng	4.53
	8	21	2	2	2809203	307	J.K. Rowling, Mary GrandPré	2003.0	Harry Potter and the Order of the Phoenix	Harry Potter and the Order of the Phoenix (Har...	eng	4.46
	9	23	15881	15881	6231171	398	J.K. Rowling, Mary GrandPré	1998.0	Harry Potter and the Chamber of Secrets	Harry Potter and the Chamber of Secrets (Harry...	eng	4.37
	10	24	6	6	3046572	332	J.K. Rowling, Mary GrandPré	2000.0	Harry Potter and the Goblet of Fire	Harry Potter and the Goblet of Fire (Harry Pot...	eng	4.53
	11	25	136251	136251	2963218	263	J.K. Rowling, Mary GrandPré	2007.0	Harry Potter and the Deathly Hallows	Harry Potter and the Deathly Hallows (Harry Po...	eng	4.61
	12	27	1	1	41335427	275	J.K. Rowling, Mary GrandPré	2005.0	Harry Potter and the Half-Blood Prince	Harry Potter and the Half-Blood Prince (Harry ...	eng	4.54
	96	422	862041	862041	2962492	76	J.K. Rowling	1998.0	Complete Harry Potter Boxed Set	Harry Potter Boxset (Harry Potter, #1-7)	eng	4.74
	613	3753	10	10	21457570	6	J.K. Rowling	2005.0	Harry Potter Collection (Harry Potter,	Harry Potter Collection (Harry	eng	4.73

1036	7018	483445	483445	471792	42	David Colbert	2001.0	The Magical Worlds of Harry Potter: A Treasury...	Magical Worlds of Harry Potter: A Treasury...	eng	3.96
------	------	--------	--------	--------	----	---------------	--------	---	---	-----	------

```
[37]: print("so the data_harry with nulls is 11 rows and data_harry without nulls is 10 rows because the original_title that has book_id 9048 is null ")
so the data_harry with nulls is 11 rows and data_harry without nulls is 10 rows because the original_title that has book_id 9048 is null
```

```
[38]: dataHarryWithNulls.loc[:,["book_id","title","average_rating"]]
```

```
[38]:
```

	book_id		title	average_rating
	1	2	Harry Potter and the Sorcerer's Stone (Harry P...	4.44
	6	18	Harry Potter and the Prisoner of Azkaban (Harr...	4.53
	8	21	Harry Potter and the Order of the Phoenix (Har...	4.46
	9	23	Harry Potter and the Chamber of Secrets (Harry...	4.37
	10	24	Harry Potter and the Goblet of Fire (Harry Pot...	4.53
	11	25	Harry Potter and the Deathly Hallows (Harry Po...	4.61
	12	27	Harry Potter and the Half-Blood Prince (Harry ...	4.54
	96	422	Harry Potter Boxset (Harry Potter, #1-7)	4.74
	613	3753	Harry Potter Collection (Harry Potter, #1-6)	4.73
	1036	7018	The Magical Worlds of Harry Potter: A Treasury...	3.96
	1266	9048	Harry Potter Schoolbooks Box Set: Two Classic ...	4.40

```
[39]: print(dataHarryWithNulls.ratings_count.max())
maxrating=dataHarryWithNulls.ratings_count.max()
```

4602479

```
[42]: maxrow=dataHarryWithNulls[dataHarryWithNulls.ratings_count==maxrating]
```

```
[43]: maxrow
```

```
[43]:
```

	book_id	goodreads_book_id	best_book_id	work_id	books_count	authors	original_publication_year	original_title	title	language_code	average_rating	rating
	1	2	3	3	4640799	491	J.K. Rowling, Mary GrandPré	1997.0	Harry Potter and the Philosopher's Stone	Harry Potter and the Sorcerer's Stone (Harry P...	eng	4.44

```
[39]: print(dataHarryWithNulls.ratings_count.max())
maxrating=dataHarryWithNulls.ratings_count.max()
```

4602479

```
[42]: maxrow=dataHarryWithNulls[dataHarryWithNulls.ratings_count==maxrating]
```

```
[43]: maxrow
```

```
[43]:
```

	original_title	title	language_code	average_rating	ratings_count	work_ratings_count	work_text_reviews_count	ratings_1	ratings_2	ratings_3	ratings_4	ratings_5
	Harry Potter and the Philosopher's Stone	Harry Potter and the Sorcerer's Stone (Harry P...	eng	4.44	4602479	4800065	75867	75504	101676	455024	1156318	3011543