

The background of the slide features a complex network pattern of interconnected nodes and lines, rendered in a light yellow/grey color against a dark blue gradient background. The nodes vary in size, and the lines form a web-like structure across the entire frame.

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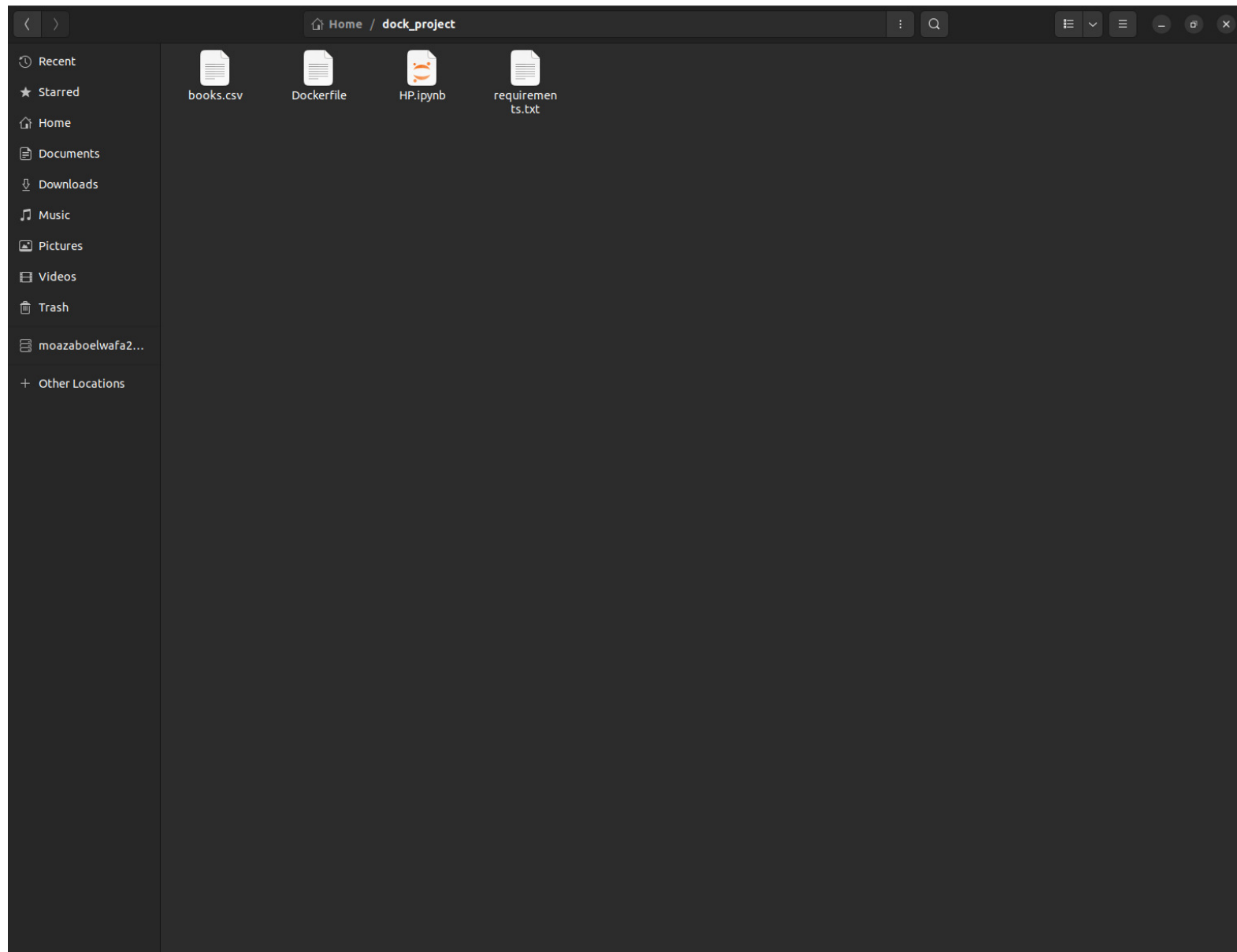
Assignment: Cloud computing

Introduction

- In this assignment we want to make a container that contain books.csv and HP.ipynb and requirements.txt
- And when we run it we can open jupyter local host server and deal with HP.ipynb
- HP.ipynb that contain analysis of books.csv
- Requirements that contain dependences that we need so we need jupyter of course and we used pandas to deal with books.csv
- So first we build Dockerfile, second we ship image, third we run container.
- And I used linux virtual machine because it faster when dealing with docker engine.



Here the files
I need to
make the
image.



Open ▾



requirements.txt
~/dock_project

Save



```
1 pandas
2 jupyter
3
4
```

Plain Text ▾

Tab Width: 8 ▾

Ln 3, Col 1 ▾

INS

Open ▾



Dockerfile

~/dock_project

Save



```
1 FROM python
2 WORKDIR /dock_project
3 COPY . /dock_project
4 RUN pip install --no-cache-dir -r requirements.txt
5 EXPOSE 8888
6 CMD ["jupyter", "notebook", "--ip='0.0.0.0'", "--port=8888", "--no-browser", "--allow-root"]
```

Dockerfile ▾

Tab Width: 8 ▾

Ln 1, Col 12 ▾

INS

Here I made image successful and give it my-jupyter as name

moaz@moaz-VirtualBox: ~/dock_project

```
(base) moaz@moaz-VirtualBox:~/dock_project$ docker build -t my-jupyter .
[+] Building 1.8s (9/9) FINISHED
=> [internal] load build definition from Dockerfile
=> ==> transferring dockerfile: 245B
=> [internal] load metadata for docker.io/library/python:latest
=> [internal] load .dockerignore
=> ==> transferring context: 2B
=> [1/4] FROM docker.io/library/python:latest@sha256:e0e2713ebf0f7b114b8bf9fbcaba9a69ef80e996b9bb3fa5837e42c779dcdc0f
=> [internal] load build context
=> ==> transferring context: 223B
=> CACHED [2/4] WORKDIR /dock_project
=> CACHED [3/4] COPY . /dock_project
=> CACHED [4/4] RUN pip install --no-cache-dir -r requirements.txt
=> exporting to image
=> ==> exporting layers
=> ==> writing image sha256:fc74dc0dd572e9015248c8851f2e89d2e64d7fd2ba6cbef6c3ea798c4c7204fd
=> ==> naming to docker.io/library/my-jupyter
(base) moaz@moaz-VirtualBox:~/dock_project$
```

docker:default
0.1s
0.0s
0.9s
0.0s
0.0s
0.0s
0.1s
0.0s
0.0s
0.0s
0.1s
0.0s
0.0s

Here I run the container successful and the id after token we use it to login

```
moaz@moaz-VirtualBox: ~/dock_project
(base) moaz@moaz-VirtualBox:~/dock_project$ docker run -p 8888:8888 my-jupyter
[I 2024-04-22 18:04:32.171 ServerApp] jupyter_lsp | extension was successfully linked.
[I 2024-04-22 18:04:32.176 ServerApp] jupyter_server_terminals | extension was successfully linked.
[I 2024-04-22 18:04:32.181 ServerApp] jupyterlab | extension was successfully linked.
[I 2024-04-22 18:04:32.185 ServerApp] notebook | extension was successfully linked.
[I 2024-04-22 18:04:32.190 ServerApp] Writing Jupyter server cookie secret to /root/.local/share/jupyter/runtime/jupyter_cookie_secret
[I 2024-04-22 18:04:32.502 ServerApp] notebook_shim | extension was successfully linked.
[I 2024-04-22 18:04:32.526 ServerApp] notebook_shim | extension was successfully loaded.
[I 2024-04-22 18:04:32.529 ServerApp] jupyter_lsp | extension was successfully loaded.
[I 2024-04-22 18:04:32.530 ServerApp] jupyter_server_terminals | extension was successfully loaded.
[I 2024-04-22 18:04:32.532 LabApp] JupyterLab extension loaded from /usr/local/lib/python3.12/site-packages/jupyterlab
[I 2024-04-22 18:04:32.533 LabApp] JupyterLab application directory is /usr/local/share/jupyter/lab
[I 2024-04-22 18:04:32.534 LabApp] Extension Manager is 'pypi'.
[I 2024-04-22 18:04:32.588 ServerApp] jupyterlab | extension was successfully loaded.
[I 2024-04-22 18:04:32.599 ServerApp] notebook | extension was successfully loaded.
[I 2024-04-22 18:04:32.601 ServerApp] Serving notebooks from local directory: /dock_project
[I 2024-04-22 18:04:32.601 ServerApp] Jupyter Server 2.14.0 is running at:
[I 2024-04-22 18:04:32.601 ServerApp] http://2eb7a242abf9:8888/tree?token=dc8a41def61607d557b9b5d2be3e438656a9de4601697ad7
[I 2024-04-22 18:04:32.601 ServerApp] http://127.0.0.1:8888/tree?token=dc8a41def61607d557b9b5d2be3e438656a9de4601697ad7
[I 2024-04-22 18:04:32.601 ServerApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 2024-04-22 18:04:32.606 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://2eb7a242abf9:8888/tree?token=dc8a41def61607d557b9b5d2be3e438656a9de4601697ad7
http://127.0.0.1:8888/tree?token=dc8a41def61607d557b9b5d2be3e438656a9de4601697ad7
[I 2024-04-22 18:04:32.629 ServerApp] Skipped non-installed server(s): bash-language-server, dockerfile-language-server-nodejs, javascript-typescript-langserver, jedi-l
anguage-server, julia-language-server, pyright, python-language-server, python-lsp-server, r-languageserver, sql-language-server, texlab, typescript-language-server, un
ified-language-server, vscode-css-languageserver-bin, vscode-html-languageserver-bin, vscode-json-languageserver-bin, yaml-language-server
[I 2024-04-22 18:05:23.463 ServerApp] 302 GET / (@172.17.0.1) 0.88ms
[I 2024-04-22 18:05:23.483 JupyterNotebookApp] 302 GET /tree? (@172.17.0.1) 0.85ms
```

Here we check that the container is running and state is up

moaz@moaz-VirtualBox: ~

```
(base) moaz@moaz-VirtualBox:~$ docker ps -a
```


CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
2eb7a242abf9	my-jupyter	"jupyter notebook --..."	2 minutes ago	Up 2 minutes	0.0.0.0:8888->8888/tcp, :::8888->8888/tcp	angry_ritchie
b8d5155ef40b	img_run_env	"bash"	30 hours ago	Exited (0) 30 hours ago		gifted_elbakyan
37d6de48d40e	img_run_env	"bash"	30 hours ago	Exited (0) 30 hours ago		cont_run_env
f91cbb0ab1c9	img_from	"bash"	31 hours ago	Exited (0) 31 hours ago		nervous_booth

```
(base) moaz@moaz-VirtualBox:~$
```


Here the jupyter server in localhost that we used port 8888 to mapping to it and we use the token to log in

Jupyter Server

localhost:8888/login?next=%2Ftree%3F



Password or token:

Log in

Token authentication is enabled

If no password has been configured, you need to open the server with its login token in the URL, or paste it above. This requirement will be lifted if you [enable a password](#).

The command:

```
jupyter server list
```

will show you the URLs of running servers with their tokens, which you can copy and paste into your browser. For example:

```
Currently running servers:
http://localhost:8888/?token=c8de56fa... :: /Users/you/notebooks
```

or you can paste just the token value into the password field on this page.

See [the documentation on how to enable a password](#) in place of token authentication, if you would like to avoid dealing with random tokens.

Cookies are required for authenticated access to the Jupyter server.

Setup a Password

You can also setup a password by entering your token and a new password on the fields below:

Token

New Password

Log in and set new password

Here the file in the workdir we put it to build the image and we will use HP.ipynb and books.csv here

Home

HP

localhost:8888/tree?

jupyter

FileViewSettingsHelp

FilesRunning

Select items to perform actions on them.

NewUploadRefresh

/

<input type="checkbox"/> Name	Last Modified	File Size
<input type="checkbox"/> HP.ipynb	1 minute ago	45.9 KB
<input type="checkbox"/> books.csv	13 hours ago	422.5 KB
<input type="checkbox"/> Dockerfile	38 minutes ago	206 B
<input type="checkbox"/> requirements.txt	22 minutes ago	17 B

Home

HP

localhost:8888/notebooks/HP.ipynb

HP Last Checkpoint: 7 hours ago

Not Trusted

File Edit View Run Kernel Settings Help

JupyterLab Python 3 (ipykernel)

[24]: import pandas as pd

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

[26]: data=data[data.columns.drop(["isbn","isbn13","image_url","small_image_url"])]
print(data.info())
print("*"*60)
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
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

Home

HP

localhost:8888/notebooks/HP.ipynb

jupyter HP Last Checkpoint: 8 hours ago

File Edit View Run Kernel Settings Help

Not Trusted

Python 3 (ipykernel)

```
ratings_3
ratings_4
ratings_5
dtype: int64

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

      (1354, 19)
      (1197, 19)

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

[21]:
```

	book_id	goodreads_book_id	best_book_id	work_id	books_count	authors	original_publication_year	original_title	title	language_code	average_ratin
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	4.4
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	4.5
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	4.4
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	4.3
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	4.5
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	4.6
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	4.5
96	422	862041	862041	2962492	76	J.K. Rowling	1998.0	Complete Harry Potter	Harry Potter Boxset (Harry	eng	4.7

Home

HP

localhost:8888/notebooks/HP.ipynb

HP Last Checkpoint: 8 hours ago

Not Trusted

FileEditViewRunKernelSettingsHelp

JupyterLabPython 3 (ipykernel)

1	2	3	3	4640799	491	J.K. Rowling, Mary GrandPré	1997.0	Harry Potter and the Philosopher's Stone	and the Sorcerer's Stone (Harry P...	eng	4.4
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	4.5
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	4.4
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	4.3
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	4.5
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	4.6
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	4.5
96	422	862041	862041	2962492	76	J.K. Rowling	1998.0	Complete Harry Potter Boxed Set	Harry Potter Boxset (Harry Potter, #1-7)	eng	4.7
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	4.7
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	3.5
1266	9048	2002	2002	8621948	5	J.K. Rowling	2001.0	NaN	Harry Potter Schoolbooks Box Set: Two Classic ...	eng	4.4

Home

HP

localhost:8888/notebooks/HP.ipynb

HP Last Checkpoint: 8 hours ago

Not Trusted

FileEditViewRunKernelSettingsHelp

JupyterLabPython 3 (ipykernel)

[20]: dataHarryWithoutNulls=dataWithoutNullRows[dataWithoutNullRows["original_title"].str.contains("Harry Potter",case=False)]

[20]:

	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

Home

HP

localhost:8888/notebooks/HP.ipynb

jupyter HP Last Checkpoint: 8 hours ago

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File Edit View Run Kernel Settings Help

JupyterLab Python 3 (ipykernel)

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

[9]:

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

[19]:

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

[19]:

book_id	title	average_rating
1	Harry Potter and the Sorcerer's Stone (Harry P...	4.44

Home

HP

localhost:8888/notebooks/HP.ipynb

jupyter HP Last Checkpoint: 8 hours ago

Not Trusted

File Edit View Run Kernel Settings Help

Code

Python 3 (ipykernel)

[1036]:

701848344548344547179242David Colbert2001.0The Magical Worlds of Harry Potter: A Treasury...Harry Potter: A Treasury...

[9]:

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")

[19]:

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

[19]:

	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

[14]:

print(dataHarryWithNulls.ratings_count.max())
maxrating=dataHarryWithNulls.ratings_count.max()

4602479

[18]:

maxrow=dataHarryWithNulls[dataHarryWithNulls.ratings_count==maxrating]

[17]:

maxrow

[17]:

	book_id	goodreads_book_id	best_book_id	work_id	books_count	authors	original_publication_year	original_title	title	language_code	average_rating	ratio
	1	2	3	3	4640799	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	

[11]:

import os
os.getcwd()

[11]:

'/home/moaz/Desktop/docks/dock_project'