

```
pip install numpy
```

Requirement already satisfied: numpy in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (1.22.3)
Note: you may need to restart the kernel to use updated packages.

```
pip install pandas
```

```
Requirement already satisfied: pandas in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (1.4.1)
Requirement already satisfied: numpy>=1.18.5 in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (from pandas) (1.22.3)
Requirement already satisfied: pytz>=2020.1 in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (from pandas) (2021.3)
Requirement already satisfied: python-dateutil>=2.8.1 in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (from pandas) (2.8.2)
Requirement already satisfied: six>=1.5 in c:\users\adiso\appdata\local\programs\python\python39\lib\site-packages (from python-dateutil>=2.8.1->pandas) (1.15.0)
Note: you may need to restart the kernel to use updated packages.
```

```
import pandas as pd
import numpy as np
```

```
movies = pd.read_csv('tmdb_5000_movies.csv')
credits = pd.read_csv('tmdb_5000_credits.csv')
```

```
movies.head(1)
```

	budget	genres	homepage	id	keywords	original_language	original_title	overview	popularity	production_companies
0	237000000	[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}]	http://www.avatarmovie.com/	19995	[{"id": 1463, "name": "culture clash"}, {"id": 1464, "name": "culture clash"}]	en	Avatar	In the 22nd century, a paraplegic Marine is dispatched to the moon Pandora on a unique mission, but becomes torn between following orders and protecting those who have become his family.	150.437577	[{"id": 1, "name": "Twentieth Century Fox Film Partners"}]

```
credits.head(1)
```

	movie_id	title	cast	crew
0	19995	Avatar	[{"cast_id": 242, "character": "Jake Sully", "...	[{"credit_id": "52fe48009251416c750aca23", "de...

```
movies.merge(credits, on='title')
```

Out[8]:

	budget	genres	homepage	id	keywords	original_language	original_title		
0	237000000	[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}]	http://www.avatarmovie.com/	19995	[{"id": 1463, "name": "culture clash"}, {"id": 1463, "name": "culture clash"}, {"id": 1463, "name": "culture clash"}]	en	Avatar	Irish	
1	300000000	[{"id": 12, "name": "Adventure"}, {"id": 14, "name": "Fantasy"}]	http://disney.go.com/disneypictures/pirates/	285	[{"id": 270, "name": "ocean"}, {"id": 726, "name": "ocean"}, {"id": 726, "name": "ocean"}]	en	Pirates of the Caribbean: At World's End	British	
2	245000000	[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}]	http://www.sonypictures.com/movies/spectre/	206647	[{"id": 470, "name": "spy"}, {"id": 818, "name": "spy"}, {"id": 818, "name": "spy"}]	en	Spectre	British	
3	250000000	[{"id": 28, "name": "Action"}, {"id": 80, "name": "Fantasy"}]	http://www.thedarkknightises.com/	49026	[{"id": 849, "name": "dc comics"}, {"id": 853, "name": "dc comics"}, {"id": 853, "name": "dc comics"}]	en	The Dark Knight Rises	British	
4	260000000	[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}]	http://movies.disney.com/john-carter	49529	[{"id": 818, "name": "based on novel"}, {"id": 818, "name": "based on novel"}, {"id": 818, "name": "based on novel"}]	en	John Carter	John Carter	
...	
4804	220000	[{"id": 28, "name": "Action"}, {"id": 80, "name": "Fantasy"}]		NaN	9367	[{"id": 5616, "name": "united states"}, {"id": 2013, "name": "mexico"}, {"id": 2013, "name": "mexico"}]	es	El Mariachi	El Mariachi
4805	9000	[{"id": 35, "name": "Comedy"}, {"id": 10749, "name": "Comedy"}]		NaN	72766	[]	en	Newlyweds	h
4806	0	[{"id": 35, "name": "Comedy"}, {"id": 18, "name": "Comedy"}]	http://www.hallmarkchannel.com/signedsealeddelivered/	231617	[{"id": 248, "name": "date"}, {"id": 699, "name": "date"}, {"id": 699, "name": "date"}]	en	Signed, Sealed, Delivered	l	
4807	0	[]	http://shanghaicalling.com/	126186	[]		en	Shanghai Calling	S
4808	0	[{"id": 99, "name": "Documentary"}]		NaN	25975	[{"id": 1523, "name": "obsession"}, {"id": 224, "name": "obsession"}, {"id": 224, "name": "obsession"}]	en	My Date with Drew	I

4809 rows × 23 columns

```
In [9]: movies.merge(credits, on='title').shape
```

```
Out[9]: (4809, 23)
```

```
In [10]: movies = movies.merge(credits, on='title')
```

```
In [11]: movies.head(1)
```

```
Out[11]:
```

	budget	genres	homepage	id	keywords	original_language	original_title	overview	popularity	production_company
0	237000000	[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}]	http://www.avatarmovie.com/	19995	[{"id": 1463, "name": "culture clash"}, {"id": 1463, "name": "culture clash"}, {"id": 1463, "name": "culture clash"}]	en	Avatar	In the 22nd century, a paraplegic Marine is di...	150.437577	[{"name": "Ingram Film Partners"}]

1 rows × 23 columns

```
In [12]: #only keep important data and truncate reduntant data
```

```
# movie_id
# cast
# crew --> Director Only
# genres
# title
# overview
# keywords
```

```
movies[['movie_id', 'title', 'overview', 'genres', 'keywords', 'cast', 'crew']]
```

Out[12]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	In the 22nd century, a paraplegic Marine is di...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 1463, "name": "culture clash"], {"id":...	{["cast_id": 242, "character": "Jake Sully", "...	{["credit_id": "52fe48009251416c750aca23", "de...
1	285	Pirates of the Caribbean: At World's End	Captain Barbossa, long believed to be dead, ha...	{["id": 12, "name": "Adventure"], {"id": 14, "...	{["id": 270, "name": "ocean"], {"id": 726, "na...	{["cast_id": 4, "character": "Captain Jack Spa...	{["credit_id": "52fe4232c3a36847f800b579", "de...
2	206647	Spectre	A cryptic message from Bond's past sends him o...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 470, "name": "spy"], {"id": 818, "name...	{["cast_id": 1, "character": "James Bond", "cr...	{["credit_id": "54805967c3a36829b5002c41", "de...
3	49026	The Dark Knight Rises	Following the death of District Attorney Harve...	{["id": 28, "name": "Action"], {"id": 80, "nam...	{["id": 849, "name": "dc comics"], {"id": 853,...	{["cast_id": 2, "character": "Bruce Wayne / Ba...	{["credit_id": "52fe4781c3a36847f81398c3", "de...
4	49529	John Carter	John Carter is a war-weary, former military ca...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 818, "name": "based on novel"], {"id":...	{["cast_id": 5, "character": "John Carter", "c...	{["credit_id": "52fe479ac3a36847f81398c3", "de...
...
4804	9367	El Mariachi	El Mariachi just wants to play his guitar and ...	{["id": 28, "name": "Action"], {"id": 80, "nam...	{["id": 5616, "name": "united states\u2013mexi...	{["cast_id": 1, "character": "El Mariachi", "c...	{["credit_id": "52fe44eec3a36847f80b280b", "de...
4805	72766	Newlyweds	A newlywed couple's honeymoon is upended by th...	{["id": 35, "name": "Comedy"], {"id": 10749, "...	[]	{["cast_id": 1, "character": "Buzzy", "credit_...	{["credit_id": "52fe487dc3a368484e0fb013", "de...
4806	231617	Signed, Sealed, Delivered	"Signed, Sealed, Delivered" introduces a dedic...	{["id": 35, "name": "Comedy"], {"id": 18, "nam...	{["id": 248, "name": "date"], {"id": 699, "nam...	{["cast_id": 8, "character": "Oliver Olu2019To...	{["credit_id": "52fe4df3c3a36847f8275ecf", "de...
4807	126186	Shanghai Calling	When ambitious New York attorney Sam is sent t...	[]	[]	{["cast_id": 3, "character": "Sam", "credit_id...	{["credit_id": "52fe4ad9c3a368484e16a36b", "de...
4808	25975	My Date with Drew	Ever since the second grade when he first saw ...	{["id": 99, "name": "Documentary"]}	{["id": 1523, "name": "obsession"], {"id": 224...	{["cast_id": 3, "character": "Herself", "credi...	{["credit_id": "58ce021b9251415a390165d9", "de...

4809 rows × 7 columns

```
In [13]: movies = movies[['movie_id', 'title', 'overview', 'genres', 'keywords', 'cast', 'crew']]
```

```
In [14]: movies.head()
```

Out[14]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	In the 22nd century, a paraplegic Marine is di...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 1463, "name": "culture clash"], {"id":...	{["cast_id": 242, "character": "Jake Sully", "...	{["credit_id": "52fe48009251416c750aca23", "de...
1	285	Pirates of the Caribbean: At World's End	Captain Barbossa, long believed to be dead, ha...	{["id": 12, "name": "Adventure"], {"id": 14, "...	{["id": 270, "name": "ocean"], {"id": 726, "na...	{["cast_id": 4, "character": "Captain Jack Spa...	{["credit_id": "52fe4232c3a36847f800b579", "de...
2	206647	Spectre	A cryptic message from Bond's past sends him o...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 470, "name": "spy"], {"id": 818, "name...	{["cast_id": 1, "character": "James Bond", "cr...	{["credit_id": "54805967c3a36829b5002c41", "de...
3	49026	The Dark Knight Rises	Following the death of District Attorney Harve...	{["id": 28, "name": "Action"], {"id": 80, "nam...	{["id": 849, "name": "dc comics"], {"id": 853,...	{["cast_id": 2, "character": "Bruce Wayne / Ba...	{["credit_id": "52fe4781c3a36847f81398c3", "de...
4	49529	John Carter	John Carter is a war-weary, former military ca...	{["id": 28, "name": "Action"], {"id": 12, "nam...	{["id": 818, "name": "based on novel"], {"id":...	{["cast_id": 5, "character": "John Carter", "c...	{["credit_id": "52fe479ac3a36847f81398c3", "de...

```
In [15]: #now check if there is any sort of missing data
```

```
movies.isnull().sum()
```

```
Out[15]: movie_id    0
         title      0
         overview   3
         genres     0
         keywords   0
         cast       0
         crew       0
         dtype: int64
```

```
In [16]: #now drop those 3 movies whose overview is unknown

movies.dropna(inplace=True)
```

```
In [17]: movies.isnull().sum()
```

```
Out[17]: movie_id    0
         title      0
         overview   0
         genres     0
         keywords   0
         cast       0
         crew       0
         dtype: int64
```

```
In [18]: #now there is no missing data in movies data frame
```

```
In [19]: #now check for any duplicate data
movies.duplicated().sum()
```

```
Out[19]: 0
```

EDITING GENRE COLUMN

```
In [20]: #check the format of genre column
movies.iloc[0].genres
```

```
Out[20]: '[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}, {"id": 14, "name": "Fantasy"}, {"id": 878, "name": "Science Fiction"}]'
```

```
In [21]: # the genres are in "List of Dictionary" format
# convert it into a single list --> ['Action', 'Adventure', 'SciFi', 'Romance']

# first check type of genre list
type(movies.iloc[0].genres)
```

```
Out[21]: str
```

```
In [22]: # it is string so convert it into integer using --> 'ast' module
```

```
import ast

#helper function to return list of genres, keywords etc.
def convert(obj):
    List = []
    for i in ast.literal_eval(obj):
        List.append(i['name'])
    return List
```

```
In [23]: # reverify the type of genre list
type(convert(movies.iloc[0].genres))
```

```
Out[23]: list
```

```
In [24]: # list of genres obtained :)

# store list in movies['genres']
movies['genres'] = movies['genres'].apply(convert)
```

```
In [25]: movies.head()
```

Out[25]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	In the 22nd century, a paraplegic Marine is di...	[Action, Adventure, Fantasy, Science Fiction]	{["id": 1463, "name": "culture clash"}, {"id":...	{["cast_id": 242, "character": "Jake Sully", "...	{["credit_id": "52fe48009251416c750aca23", "de...
1	285	Pirates of the Caribbean: At World's End	Captain Barbossa, long believed to be dead, ha...	[Adventure, Fantasy, Action]	{["id": 270, "name": "ocean"}, {"id": 726, "na...	{["cast_id": 4, "character": "Captain Jack Spa...	{["credit_id": "52fe4232c3a36847f800b579", "de...
2	206647	Spectre	A cryptic message from Bond's past sends him o...	[Action, Adventure, Crime]	{["id": 470, "name": "spy"}, {"id": 818, "name...	{["cast_id": 1, "character": "James Bond", "cr...	{["credit_id": "54805967c3a36829b5002c41", "de...
3	49026	The Dark Knight Rises	Following the death of District Attorney Harve...	[Action, Crime, Drama, Thriller]	{["id": 849, "name": "dc comics"}, {"id": 853,...	{["cast_id": 2, "character": "Bruce Wayne / Ba...	{["credit_id": "52fe4781c3a36847f81398c3", "de...
4	49529	John Carter	John Carter is a war-weary, former military ca...	[Action, Adventure, Science Fiction]	{["id": 818, "name": "based on novel"}, {"id":...	{["cast_id": 5, "character": "John Carter", "c...	{["credit_id": "52fe479ac3a36847f813eaa3", "de...

EDITING KEYWORDS COLUMN

In [26]:

```
# repeat same step on keywords column and convert list of dicts into list of strings
type(movies.iloc[0].keywords)
```

Out[26]:

```
str
```

In [27]:

```
type(convert(movies.iloc[0].keywords))
```

Out[27]:

```
list
```

In [28]:

```
#store result in movies['keywords']
movies['keywords'] = movies['keywords'].apply(convert)
```

In [29]:

```
movies.head()
```

Out[29]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	In the 22nd century, a paraplegic Marine is di...	[Action, Adventure, Fantasy, Science Fiction]	[culture clash, future, space war, space colon...	{["cast_id": 242, "character": "Jake Sully", "...	{["credit_id": "52fe48009251416c750aca23", "de...
1	285	Pirates of the Caribbean: At World's End	Captain Barbossa, long believed to be dead, ha...	[Adventure, Fantasy, Action]	[ocean, drug abuse, exotic island, east india ...	{["cast_id": 4, "character": "Captain Jack Spa...	{["credit_id": "52fe4232c3a36847f800b579", "de...
2	206647	Spectre	A cryptic message from Bond's past sends him o...	[Action, Adventure, Crime]	[spy, based on novel, secret agent, sequel, mi...	{["cast_id": 1, "character": "James Bond", "cr...	{["credit_id": "54805967c3a36829b5002c41", "de...
3	49026	The Dark Knight Rises	Following the death of District Attorney Harve...	[Action, Crime, Drama, Thriller]	[dc comics, crime fighter, terrorist, secret i...	{["cast_id": 2, "character": "Bruce Wayne / Ba...	{["credit_id": "52fe4781c3a36847f81398c3", "de...
4	49529	John Carter	John Carter is a war-weary, former military ca...	[Action, Adventure, Science Fiction]	[based on novel, mars, medallion, space travel...	{["cast_id": 5, "character": "John Carter", "c...	{["credit_id": "52fe479ac3a36847f813eaa3", "de...

EDITING CAST COLUMN

In [30]:

```
#helper function to return first 3 cast names of each movie

def convertCast(obj):
    List = []
    counter = 0;
    for i in ast.literal_eval(obj):
        if counter < 3:
            List.append(i['name'])
            counter += 1
        else:
            break
    return List
```

In [31]:

```
#store result in movies['cast']
movies['cast'] = movies['cast'].apply(convertCast)
```

EDITING CREW COLUMN

```
In [32]: #view crew column format
movies['crew'][0]
```

```
Out[32]: '[{"credit_id": "52fe48009251416c750aca23", "department": "Editing", "gender": 0, "id": 1721, "job": "Editor",
"name": "Stephen E. Rivkin"}, {"credit_id": "539c47ecc3a36810e3001f87", "department": "Art", "gender": 2, "id":
496, "job": "Production Design", "name": "Rick Carter"}, {"credit_id": "54491c89c3a3680fb4001cf7", "department":
"Sound", "gender": 0, "id": 900, "job": "Sound Designer", "name": "Christopher Boyes"}, {"credit_id": "54491c
b70e0a267480001bd0", "department": "Sound", "gender": 0, "id": 900, "job": "Supervising Sound Editor", "name":
"Christopher Boyes"}, {"credit_id": "539c4a4cc3a36810c9002101", "department": "Production", "gender": 1, "id":
1262, "job": "Casting", "name": "Mali Finn"}, {"credit_id": "5544ee3b925141499f0008fc", "department": "Sound",
"gender": 2, "id": 1729, "job": "Original Music Composer", "name": "James Horner"}, {"credit_id": "52fe48009251
416c750ac9c3", "department": "Directing", "gender": 2, "id": 2710, "job": "Director", "name": "James Cameron"},
{"credit_id": "52fe48009251416c750ac9d9", "department": "Writing", "gender": 2, "id": 2710, "job": "Writer", "n
ame": "James Cameron"}, {"credit_id": "52fe48009251416c750aca17", "department": "Editing", "gender": 2, "id": 2
710, "job": "Editor", "name": "James Cameron"}, {"credit_id": "52fe48009251416c750aca29", "department": "Produc
tion", "gender": 2, "id": 2710, "job": "Producer", "name": "James Cameron"}, {"credit_id": "52fe48009251416c750
aca3f", "department": "Writing", "gender": 2, "id": 2710, "job": "Screenplay", "name": "James Cameron"}, {"cred
it_id": "539c4987c3a36810ba0021a4", "department": "Art", "gender": 2, "id": 7236, "job": "Art Direction", "name
": "Andrew Menzies"}, {"credit_id": "549598c3c3a3686ae9004383", "department": "Visual Effects", "gender": 0, "i
d": 6690, "job": "Visual Effects Producer", "name": "Jill Brooks"}, {"credit_id": "52fe48009251416c750aca4b", "
department": "Production", "gender": 1, "id": 6347, "job": "Casting", "name": "Margery Simkin"}, {"credit_id":
"570b6f419251417da70032fe", "department": "Art", "gender": 2, "id": 6878, "job": "Supervising Art Director", "n
ame": "Kevin Ishioka"}, {"credit_id": "5495a0fac3a3686ae9004468", "department": "Sound", "gender": 0, "id": 688
3, "job": "Music Editor", "name": "Dick Bernstein"}, {"credit_id": "54959706c3a3686af3003e81", "department": "S
ound", "gender": 0, "id": 8159, "job": "Sound Effects Editor", "name": "Shannon Mills"}, {"credit_id": "54491d5
8c3a3680fb1001ccb", "department": "Sound", "gender": 0, "id": 8160, "job": "Foley", "name": "Dennie Thorpe"}, {
"credit_id": "54491d6cc3a3680fa5001b2c", "department": "Sound", "gender": 0, "id": 8163, "job": "Foley", "name"
: "Jana Vance"}, {"credit_id": "52fe48009251416c750aca57", "department": "Costume & Make-Up", "gender": 1, "id"
: 8527, "job": "Costume Design", "name": "Deborah Lynn Scott"}, {"credit_id": "52fe48009251416c750aca2f", "depa
rtment": "Production", "gender": 2, "id": 8529, "job": "Producer", "name": "Jon Landau"}, {"credit_id": "539c49
37c3a36810ba002194", "department": "Art", "gender": 0, "id": 9618, "job": "Art Direction", "name": "Sean Hawort
h"}, {"credit_id": "539c49b6c3a36810c10020e6", "department": "Art", "gender": 1, "id": 12653, "job": "Set Decor
ation", "name": "Kim Sinclair"}, {"credit_id": "570b6f2f9251413a0e00020d", "department": "Art", "gender": 1, "i
d": 12653, "job": "Supervising Art Director", "name": "Kim Sinclair"}, {"credit_id": "54491a6c0e0a26748c001b19"
, "department": "Art", "gender": 2, "id": 14350, "job": "Set Designer", "name": "Richard F. Mays"}, {"credit_id
": "56928cf4c3a3684cff0025c4", "department": "Production", "gender": 1, "id": 20294, "job": "Executive Producer
", "name": "Laeta Kalogridis"}, {"credit_id": "52fe48009251416c750aca51", "department": "Costume & Make-Up", "g
ender": 0, "id": 17675, "job": "Costume Design", "name": "Mayes C. Rubeo"}, {"credit_id": "52fe48009251416c750a
call", "department": "Camera", "gender": 2, "id": 18265, "job": "Director of Photography", "name": "Mauro Fiore
"}, {"credit_id": "5449194d0e0a26748f001b39", "department": "Art", "gender": 0, "id": 42281, "job": "Set Design
er", "name": "Scott Herbertson"}, {"credit_id": "52fe48009251416c750aca05", "department": "Crew", "gender": 0,
"id": 42288, "job": "Stunts", "name": "Woody Schultz"}, {"credit_id": "5592aefb92514152de0010f5", "department":
"Costume & Make-Up", "gender": 0, "id": 29067, "job": "Makeup Artist", "name": "Linda DeVetta"}, {"credit_id":
"5592afa492514152de00112c", "department": "Costume & Make-Up", "gender": 0, "id": 29067, "job": "Hairstylist",
"name": "Linda DeVetta"}, {"credit_id": "54959ed592514130fc002e5d", "department": "Camera", "gender": 2, "id":
33302, "job": "Camera Operator", "name": "Richard Bluck"}, {"credit_id": "539c4891c3a36810ba002147", "departmen
t": "Art", "gender": 2, "id": 33303, "job": "Art Direction", "name": "Simon Bright"}, {"credit_id": "54959c0692
51417a81001f3a", "department": "Visual Effects", "gender": 0, "id": 113145, "job": "Visual Effects Supervisor",
"name": "Richard Martin"}, {"credit_id": "54959a0dc3a3680ff5002c8d", "department": "Crew", "gender": 2, "id": 5
8188, "job": "Visual Effects Editor", "name": "Steve R. Moore"}, {"credit_id": "52fe48009251416c750acal0", "dep
artment": "Editing", "gender": 2, "id": 58871, "job": "Editor", "name": "John Refoua"}, {"credit_id": "54491a4d
c3a3680fc30018ca", "department": "Art", "gender": 0, "id": 92359, "job": "Set Designer", "name": "Karl J. Marti
n"}, {"credit_id": "52fe48009251416c750aca35", "department": "Camera", "gender": 1, "id": 72201, "job": "Direct
or of Photography", "name": "Chiling Lin"}, {"credit_id": "52fe48009251416c750ac9ff", "department": "Crew", "ge
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In [33]: *#we only need director for our purpose*

```
#helper function to fetch director
def fetch_director(obj):
    List = []
    for i in ast.literal_eval(obj):
        if i['job'] == "Director":
            List.append(i['name'])
            break
    return List
```

In [34]: `movies['crew'] = movies['crew'].apply(fetch_director)`

In [35]: `movies.head()`

Out[35]:	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	In the 22nd century, a paraplegic Marine is di...	[Action, Adventure, Fantasy, Science Fiction]	[culture clash, future, space war, space colon...	[Sam Worthington, Zoe Saldana, Sigourney Weaver]	[James Cameron]
1	285	Pirates of the Caribbean: At World's End	Captain Barbossa, long believed to be dead, ha...	[Adventure, Fantasy, Action]	[ocean, drug abuse, exotic island, east india ...	[Johnny Depp, Orlando Bloom, Keira Knightley]	[Gore Verbinski]
2	206647	Spectre	A cryptic message from Bond's past sends him o...	[Action, Adventure, Crime]	[spy, based on novel, secret agent, sequel, mi...	[Daniel Craig, Christoph Waltz, Léa Seydoux]	[Sam Mendes]
3	49026	The Dark Knight Rises	Following the death of District Attorney Harve...	[Action, Crime, Drama, Thriller]	[dc comics, crime fighter, terrorist, secret i...	[Christian Bale, Michael Caine, Gary Oldman]	[Christopher Nolan]
4	49529	John Carter	John Carter is a war-weary, former military ca...	[Action, Adventure, Science Fiction]	[based on novel, mars, medallion, space travel...	[Taylor Kitsch, Lynn Collins, Samantha Morton]	[Andrew Stanton]

EDITING OVERVIEW COLUMN

In [36]: *# check overview data format*
`movies['overview'][0]`

Out[36]: 'In the 22nd century, a paraplegic Marine is dispatched to the moon Pandora on a unique mission, but becomes to rn between following orders and protecting an alien civilization.'

In [37]: *# it is in string format --> convert it into a list and store in movies['overview']*
`movies['overview'] = movies['overview'].apply(lambda x: x.split())`

In [38]: *#verify type*
`type(movies['overview'][0])`

Out[38]: list

In [39]: `movies.head()`

Out[39]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	[In, the, 22nd, century,, a, paraplegic, Marin...	[Action, Adventure, Fantasy, Science Fiction]	[culture clash, future, space war, space colon...	[Sam Worthington, Zoe Saldana, Sigourney Weaver]	[James Cameron]
1	285	Pirates of the Caribbean: At World's End	[Captain, Barbossa,, long, believed, to, be, d...	[Adventure, Fantasy, Action]	[ocean, drug abuse, exotic island, east india ...	[Johnny Depp, Orlando Bloom, Keira Knightley]	[Gore Verbinski]
2	206647	Spectre	[A, cryptic, message, from, Bond's, past, send...	[Action, Adventure, Crime]	[spy, based on novel, secret agent, sequel, mi...	[Daniel Craig, Christoph Waltz, Léa Seydoux]	[Sam Mendes]
3	49026	The Dark Knight Rises	[Following, the, death, of, District, Attorney...	[Action, Crime, Drama, Thriller]	[dc comics, crime fighter, terrorist, secret i...	[Christian Bale, Michael Caine, Gary Oldman]	[Christopher Nolan]
4	49529	John Carter	[John, Carter, is, a, war-weary,, former, mili...	[Action, Adventure, Science Fiction]	[based on novel, mars, medallion, space travel...	[Taylor Kitsch, Lynn Collins, Samantha Morton]	[Andrew Stanton]

Remove spaces between words of same entity

In [40]: *# repeat this step for genres keywords cast and crew*

```
movies['genres'] = movies['genres'].apply(lambda x: [i.replace(" ", "") for i in x])
movies['keywords'] = movies['keywords'].apply(lambda x: [i.replace(" ", "") for i in x])
movies['cast'] = movies['cast'].apply(lambda x: [i.replace(" ", "") for i in x])
movies['crew'] = movies['crew'].apply(lambda x: [i.replace(" ", "") for i in x])
```

In [41]: `movies.head()`

Out[41]:

	movie_id	title	overview	genres	keywords	cast	crew
0	19995	Avatar	[In, the, 22nd, century,, a, paraplegic, Marin...	[Action, Adventure, Fantasy, ScienceFiction]	[cultureclash, future, spacewar, spacecolony, ...	[SamWorthington, ZoeSaldana, SigourneyWeaver]	[JamesCameron]
1	285	Pirates of the Caribbean: At World's End	[Captain, Barbossa,, long, believed, to, be, d...	[Adventure, Fantasy, Action]	[ocean, drugabuse, exoticisland, eastindiatrad...	[JohnnyDepp, OrlandoBloom, KeiraKnightley]	[GoreVerbinski]
2	206647	Spectre	[A, cryptic, message, from, Bond's, past, send...	[Action, Adventure, Crime]	[spy, basedonnovel, secretagent, sequel, mi6, ...	[DanielCraig, ChristophWaltz, LéaSeydoux]	[SamMendes]
3	49026	The Dark Knight Rises	[Following, the, death, of, District, Attorney...	[Action, Crime, Drama, Thriller]	[dccomics, crimefighter, terrorist, secretiden...	[ChristianBale, MichaelCaine, GaryOldman]	[ChristopherNolan]
4	49529	John Carter	[John, Carter, is, a, war-weary,, former, mili...	[Action, Adventure, ScienceFiction]	[basedonnovel, mars, medallion, spacetravel, p...	[TaylorKitsch, LynnCollins, SamanthaMorton]	[AndrewStanton]

Create a final Data Frame Composed only of 3 columns

movie_id, title & tags

In [42]: *# here tag column contains every detail of overview, genre, keywords, cast & crew*

```
movies['tags'] = movies['overview'] + movies['genres'] + movies['keywords'] + movies['cast'] + movies['crew']
```

In [43]: *# remove redundant columns and create a new data frame*

```
new_df = movies[['movie_id', 'title', 'tags']]
```

In [44]: *# convert lists in tags column into strings*

```
new_df['tags'] = new_df['tags'].apply(lambda x: " ".join(x))
```

```
C:\Users\adiso\AppData\Local\Temp\ipykernel_18960\2487449930.py:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
new_df['tags'] = new_df['tags'].apply(lambda x: " ".join(x))
```

```
In [45]: new_df['tags'][0]
```

```
Out[45]: 'In the 22nd century, a paraplegic Marine is dispatched to the moon Pandora on a unique mission, but becomes torn between following orders and protecting an alien civilization. Action Adventure Fantasy ScienceFiction culture clash future spacewar spacecolony society spacetravel futuristic romance space alien tribe alienplanet cgi marine soldier battle loveaffair antiwar powerrelations mindandsoul 3d SamWorthington ZoeSaldana SigourneyWeaver JamesCameron'
```

```
In [46]: # convert tags strings into Lower Case --> RECOMMENDED

new_df['tags'] = new_df['tags'].apply(lambda x: x.lower())
```

```
C:\Users\adiso\AppData\Local\Temp\ipykernel_18960\1211957509.py:3: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
new_df['tags'] = new_df['tags'].apply(lambda x: x.lower())
```

```
In [47]: # OUR FINAL DATA FRAME

new_df.head()
```

```
Out[47]:
```

	movie_id		title	tags
0	19995		Avatar	in the 22nd century, a paraplegic marine is di...
1	285	Pirates of the Caribbean: At World's End		captain barbossa, long believed to be dead, ha...
2	206647		Spectre	a cryptic message from bond's past sends him o...
3	49026	The Dark Knight Rises		following the death of district attorney harve...
4	49529		John Carter	john carter is a war-weary, former military ca...

```
In [ ]:
```

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