

```
In [1]: import numpy as np
import pandas as pd
```

```
In [2]: movies = pd.read_csv('tmdb_5000_movies.csv')
credits = pd.read_csv('tmdb_5000_credits.csv')
```

```
In [3]: movies.head(1)
```

```
Out[3]:
```

| | 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": 1464, "name": "culture clash"}] | en | Avatar |

```
In [4]: credits.head(1)
```

```
Out[4]:
```

| | movie_id | title | cast | crew |
|---|----------|--------|--|--|
| 0 | 19995 | Avatar | [{"cast_id": 242, "character": "Jake Sully", "credit_id": "52fe48009251416c750aca23", "name": "Sam Worthington", "order": 1, "role": "Actor"}] | [{"credit_id": "52fe48009251416c750aca23", "name": "James Cameron", "role": "Director"}] |

Merging the data

```
In [5]: movies = movies.merge(credits, on = 'title')
```

```
In [6]: movies.head(1)
```

```
Out[6]:
```

| | 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": 1464, "name": "culture clash"}] | en | Avatar |

1 rows × 23 columns

Removing the unwanted column

```
In [7]: movies = movies[['movie_id', 'title', 'overview', 'genres', 'keywords', 'cast', 'crew']]
```

```
In [8]: movies.head()
```

Out[8]:

| | 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": "52fe48009251416c750aca2...", "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": "54805967c3a36829b5002c4...", "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": "52fe4781c3a36847f81398c...", "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": "52fe479ac3a36847f813eaa...", "de... |

```
In [9]: movies.isnull().sum()
```

Out[9]:

| | |
|----------|-------|
| movie_id | 0 |
| title | 0 |
| overview | 3 |
| genres | 0 |
| keywords | 0 |
| cast | 0 |
| crew | 0 |
| dtype: | int64 |

```
In [10]: movies.dropna(inplace=True)
```

```
In [11]: movies.isnull().sum()
```

```
Out[11]: movie_id    0
         title      0
         overview   0
         genres     0
         keywords   0
         cast       0
         crew       0
         dtype: int64
```

```
In [12]: movies.duplicated().sum()
```

```
Out[12]: 0
```

```
In [13]: movies.iloc[0].genres
```

```
Out[13]: '[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}, {"id": 14, "name": "Fantasy"}, {"id": 878, "name": "Science Fiction"}]'
```

```
In [14]: import ast
         ast.literal_eval('[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}, {"id": 14, "name": "Fantasy"}, {"id": 878, "name": "Science Fiction"}]')
```

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

```
In [15]: def convert(obj):
         L = []
         for i in ast.literal_eval(obj):
             L.append(i['name'])
         return L
```

```
In [16]: movies['genres'] = movies['genres'].apply(convert)
```

```
In [17]: movies['keywords'] = movies['keywords'].apply(convert)
```

```
In [18]: movies.head()
```

Out[18]:

| | 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.. |

```

In [19]: def convert3(obj):
          L = []
          counter = 0
          for i in ast.literal_eval(obj):
              if counter != 3:
                  L.append(i['name'])
                  counter+=1
              else:
                  break
          return L

```

```

In [20]: movies['cast'] = movies['cast'].apply(convert3)

```

```

In [21]: movies.head()

```

Out[21]:

| | movie_id | title | overview | genres | keywords | cast | cre |
|---|----------|--|---|---|---|--|---|
| 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] | ["credit_i "52fe48009251416c750aca2. "d |
| 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] | ["credit_i "52fe4232c3a36847f800b57/ "d |
| 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] | ["credit_i "54805967c3a36829b5002c4 "d |
| 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] | ["credit_i "52fe4781c3a36847f81398c "d |
| 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] | ["credit_i "52fe479ac3a36847f813eaa. "d |

```

In [22]: def fetch_director(obj):
          L = []
          for i in ast.literal_eval(obj):
              if i['job'] == 'Director':
                  L.append(i['name'])
              break
          return L

```

```

In [23]: movies['crew'] = movies['crew'].apply(fetch_director)

```

```

In [24]: movies.head()

```

Out[24]:

| | 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] |

```
In [25]: movies['overview'] = movies['overview'].apply(lambda x:x.split())
```

```
In [26]: movies.head()
```

Out[26]:

| | 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] |

Removing Space Between Word

```
In [27]: 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 [28]: movies.head()
```

Out[28]:

| | movie_id | title | overview | genres | keywords | cast | |
|---|----------|--|---|--|--|---|----------------|
| 0 | 1995 | Avatar | [In, the, 22nd, century,, a, paraplegic, Marin... | [Action, Adventure, Fantasy, ScienceFiction] | [cultureclash, future, spacewar, spacecolony, ...] | [SamWorthington, ZoeSaldana, SigourneyWeaver] | [JamesCamer |
| 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] | [GoreVerbir |
| 2 | 206647 | Spectre | [A, cryptic, message, from, Bond's, past, send... | [Action, Adventure, Crime] | [spy, basedonnovel, secretagent, sequel, mi6, ...] | [DanielCraig, ChristophWaltz, LéaSeydoux] | [SamMen |
| 3 | 49026 | The Dark Knight Rises | [Following, the, death, of, District, Attorney... | [Action, Crime, Drama, Thriller] | [dccomics, crimefighter, terrorist, secretiden... | [ChristianBale, MichaelCaine, GaryOldman] | [ChristopherNo |
| 4 | 49529 | John Carter | [John, Carter, is, a, war-weary,, former, mili... | [Action, Adventure, ScienceFiction] | [basedonnovel, mars, medallion, spacetravel, p... | [TaylorKitsch, LynnCollins, SamanthaMorton] | [AndrewStant |

Creating a new column

```
In [29]: movies['tags'] = movies['overview'] + movies['keywords'] + movies['cast'] + movies['director']
```

```
In [30]: movies.head()
```


Out[30]:

| | movie_id | title | overview | genres | keywords | cast | director |
|---|----------|--|---|--|--|---|-----------------|
| 0 | 1995 | 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] | [ChristopherNo |
| 4 | 49529 | John Carter | [John, Carter, is, a, war-weary,, former, mili... | [Action, Adventure, ScienceFiction] | [basedonnovel, mars, medallion, spacetravel, p... | [TaylorKitsch, LynnCollins, SamanthaMorton] | [AndrewStanton] |

Creating new dataframe

```
In [31]: new_df = movies[['movie_id', 'title', 'tags']]

In [32]: new_df
```

Out[32]:

| | movie_id | | title | tags |
|------|----------|--|-------------|---|
| 0 | 19995 | | Avatar | [In, the, 22nd, century,, a, paraplegic, Marin... |
| 1 | 285 | Pirates of the Caribbean: At World's End | | [Captain, Barbossa,, long, believed, to, be, d... |
| 2 | 206647 | | Spectre | [A, cryptic, message, from, Bond's, past, send... |
| 3 | 49026 | The Dark Knight Rises | | [Following, the, death, of, District, Attorney... |
| 4 | 49529 | | John Carter | [John, Carter, is, a, war-weary,, former, mili... |
| ... | ... | | ... | ... |
| 4804 | 9367 | | El Mariachi | [El, Mariachi, just, wants, to, play, his, gui... |
| 4805 | 72766 | | Newlyweds | [A, newlywed, couple's, honeymoon, is, upended... |
| 4806 | 231617 | Signed, Sealed, Delivered | | ["Signed,, Sealed,, Delivered", introduces, a,... |
| 4807 | 126186 | Shanghai Calling | | [When, ambitious, New, York, attorney, Sam, is... |
| 4808 | 25975 | My Date with Drew | | [Ever, since, the, second, grade, when, he, fi... |

4806 rows × 3 columns

In [33]: `new_df['tags'] = new_df['tags'].apply(lambda x: " ".join(x))`

C:\Users\shail\AppData\Local\Temp\ipykernel_14420\3089450492.py:1: 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 [34]: `new_df.head()`

Out[34]:

| | 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 [35]: `new_df['tags'][0]`

```
Out[35]: '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. cultureclash future spacewar spacecolony society spacetravel futurist ic romance space alien tribe alienplanet cgi marine soldier battle loveaffair anti war powerrelations mindandsoul 3d SamWorthington ZoeSaldana SigourneyWeaver JamesCameron'
```

Convert into lower case

```
In [36]: new_df['tags'] = new_df['tags'].apply(lambda x:x.lower())
```

C:\Users\shail\AppData\Local\Temp\ipykernel_14420\3214958533.py:1: 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 [37]: new_df.head()
```

```
Out[37]:
```

| | 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... |

Vectorization for recommendation ML projects

```
In [38]: from sklearn.feature_extraction.text import CountVectorizer
cv = CountVectorizer(max_features=5000,stop_words='english')
```

```
In [39]: vectors = cv.fit_transform(new_df['tags']).toarray()
```

```
In [40]: cv.fit_transform(new_df['tags']).toarray().shape
```

```
Out[40]: (4806, 5000)
```

```
In [41]: vectors[0]
```

```
Out[41]: array([0, 0, 0, ..., 0, 0, 0], dtype=int64)
```

```
In [42]: !pip install nltk
```

```
Requirement already satisfied: nltk in c:\users\shail\anaconda3\lib\site-packages (3.8.1)  
Requirement already satisfied: click in c:\users\shail\anaconda3\lib\site-packages (from nltk) (8.0.4)  
Requirement already satisfied: joblib in c:\users\shail\anaconda3\lib\site-packages (from nltk) (1.2.0)  
Requirement already satisfied: regex>=2021.8.3 in c:\users\shail\anaconda3\lib\site-packages (from nltk) (2022.7.9)  
Requirement already satisfied: tqdm in c:\users\shail\anaconda3\lib\site-packages (from nltk) (4.65.0)  
Requirement already satisfied: colorama in c:\users\shail\anaconda3\lib\site-packages (from click->nltk) (0.4.6)
```

```
In [43]: import nltk
```

```
In [44]: from nltk.stem.porter import PorterStemmer  
ps = PorterStemmer()
```

```
In [45]: def stem(text):  
    y = []  
  
    for i in text.split():  
        y.append(ps.stem(i))  
    return " ".join(y)
```

```
In [46]: new_df['tags'] = new_df['tags'].apply(stem)
```

```
C:\Users\shail\AppData\Local\Temp\ipykernel_14420\3021978705.py:1: 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(stem)
```

```
In [47]: # Example  
ps.stem('loved')
```

```
Out[47]: 'love'
```

Cosine Similarities

```
In [48]: from sklearn.metrics.pairwise import cosine_similarity
```

```
In [49]: cosine_similarity(vectors).shape
```

Out[49]: (4806, 4806)

```
In [50]: similarity = cosine_similarity(vectors)
```

```
In [51]: similarity
```

```
Out[51]: array([[1.         , 0.         , 0.         , ..., 0.         , 0.02752409,
                0.         ],
                [0.         , 1.         , 0.         , ..., 0.02865341, 0.         ,
                0.         ],
                [0.         , 0.         , 1.         , ..., 0.02865341, 0.         ,
                0.         ],
                ...,
                [0.         , 0.02865341, 0.02865341, ..., 1.         , 0.048795  ,
                0.05006262],
                [0.02752409, 0.         , 0.         , ..., 0.048795  , 1.         ,
                0.05129892],
                [0.         , 0.         , 0.         , ..., 0.05006262, 0.05129892,
                1.         ]])
```

```
In [52]: similarity[2]
```

```
Out[52]: array([0.         , 0.         , 1.         , ..., 0.02865341, 0.         ,
                0.         ])
```

```
In [53]: # Fixing the index
```

```
list(enumerate(similarity[0]))
```

```
Out[53]: [(0, 1.0000000000000004),
(1, 0.0),
(2, 0.0),
(3, 0.0211110016546037454),
(4, 0.11295649894498103),
(5, 0.05025189076296061),
(6, 0.0),
(7, 0.05647824947249051),
(8, 0.0),
(9, 0.0),
(10, 0.0),
(11, 0.029424494316824985),
(12, 0.0),
(13, 0.0),
(14, 0.0),
(15, 0.0),
(16, 0.0),
(17, 0.06917144638660747),
(18, 0.07173421497882157),
(19, 0.022662980454966834),
(20, 0.0),
(21, 0.033501260508640406),
(22, 0.0),
(23, 0.0),
(24, 0.0),
(25, 0.03798685881987932),
(26, 0.09231861823449955),
(27, 0.12562972690740154),
(28, 0.03481553119113957),
(29, 0.025125945381480306),
(30, 0.0),
(31, 0.07106690545187017),
(32, 0.02461829819586655),
(33, 0.0),
(34, 0.0),
(35, 0.0),
(36, 0.11769797726729994),
(37, 0.030303030303030307),
(38, 0.0),
(39, 0.0),
(40, 0.0),
(41, 0.0787295821622217),
(42, 0.0),
(43, 0.051899929610768204),
(44, 0.0),
(45, 0.0492365963917331),
(46, 0.0646508183835236),
(47, 0.16000261230887305),
(48, 0.023911404992940522),
(49, 0.03413943709994595),
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```

```
In [55]: sorted(list(enumerate(similarity[0])), reverse=True, key= lambda x:x[1]) [1:6]
```

```
Out[55]: [(3608, 0.21320071635561044),
          (1216, 0.20769510081357428),
          (1920, 0.2059714602177749),
          (582, 0.20533080093573816),
          (539, 0.20100756305184245)]
```

```
In [56]: def recommend(movie):
          movie_index = movies[movies['title'] == movie].index[0]
          distances = similarity[movie_index]
          movies_list = sorted(list(enumerate(distances)), reverse=True, key=lambda x: x[
          for i in movies_list:
              print(i[0])
```

```
In [57]: recommend('Avatar')
```

```
3608
1216
1920
582
539
```

```
In [58]: def recommend(movie):
          movie_index = movies[movies['title'] == movie].index[0]
          distances = similarity[movie_index]
          movies_list = sorted(list(enumerate(distances)), reverse=True, key=lambda x: x[
          for i in movies_list:
              print(new_df.iloc[i[0]].title)
```

```
In [59]: recommend('Avatar') # Every movie based on the Alien
```

```
Apollo 18
Aliens vs Predator: Requiem
Lifeforce
Battle: Los Angeles
Titan A.E.
```

```
In [61]: import pickle
```

```
In [62]: pickle.dump(new_df, open('movies.pkl', 'wb'))
```

```
In [64]: new_df['title'].values
```

```
Out[64]: array(['Avatar', 'Pirates of the Caribbean: At World's End', 'Spectre',
                ..., 'Signed, Sealed, Delivered', 'Shanghai Calling',
                'My Date with Drew'], dtype=object)
```

```
In [65]: pickle.dump(new_df.to_dict(), open('movie_dict.pkl', 'wb'))
```

```
In [66]: pickle.dump(similarity, open('similarity.pkl', 'wb'))
```

```
In [ ]:
```