**import** numpy **as** np

**import** pandas **as** pd

In [2]:

movies**=**pd**.**read\_csv("tmdb\_5000\_movies.csv")

In [3]:

movies

Out[3]:

|  | **budget** | **genres** | **homepage** | **id** | **keywords** | **original\_language** | **original\_title** | **overview** | **popularity** | **production\_companies** | **production\_countries** | **release\_date** | **revenue** | **runtime** | **spoken\_languages** | **status** | **tagline** | **title** | **vote\_average** | **vote\_count** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | 237000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.avatarmovie.com/ | 19995 | [{"id": 1463, "name": "culture clash"}, {"id":... | en | Avatar | In the 22nd century, a paraplegic Marine is di... | 150.437577 | [{"name": "Ingenious Film Partners", "id": 289... | [{"iso\_3166\_1": "US", "name": "United States o... | 2009-12-10 | 2787965087 | 162.0 | [{"iso\_639\_1": "en", "name": "English"}, {"iso... | Released | Enter the World of Pandora. | Avatar | 7.2 | 11800 |
| **1** | 300000000 | [{"id": 12, "name": "Adventure"}, {"id": 14, "... | http://disney.go.com/disneypictures/pirates/ | 285 | [{"id": 270, "name": "ocean"}, {"id": 726, "na... | en | Pirates of the Caribbean: At World's End | Captain Barbossa, long believed to be dead, ha... | 139.082615 | [{"name": "Walt Disney Pictures", "id": 2}, {"... | [{"iso\_3166\_1": "US", "name": "United States o... | 2007-05-19 | 961000000 | 169.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | At the end of the world, the adventure begins. | Pirates of the Caribbean: At World's End | 6.9 | 4500 |
| **2** | 245000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.sonypictures.com/movies/spectre/ | 206647 | [{"id": 470, "name": "spy"}, {"id": 818, "name... | en | Spectre | A cryptic message from Bond’s past sends him o... | 107.376788 | [{"name": "Columbia Pictures", "id": 5}, {"nam... | [{"iso\_3166\_1": "GB", "name": "United Kingdom"... | 2015-10-26 | 880674609 | 148.0 | [{"iso\_639\_1": "fr", "name": "Fran\u00e7ais"},... | Released | A Plan No One Escapes | Spectre | 6.3 | 4466 |
| **3** | 250000000 | [{"id": 28, "name": "Action"}, {"id": 80, "nam... | http://www.thedarkknightrises.com/ | 49026 | [{"id": 849, "name": "dc comics"}, {"id": 853,... | en | The Dark Knight Rises | Following the death of District Attorney Harve... | 112.312950 | [{"name": "Legendary Pictures", "id": 923}, {"... | [{"iso\_3166\_1": "US", "name": "United States o... | 2012-07-16 | 1084939099 | 165.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | The Legend Ends | The Dark Knight Rises | 7.6 | 9106 |
| **4** | 260000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://movies.disney.com/john-carter | 49529 | [{"id": 818, "name": "based on novel"}, {"id":... | en | John Carter | John Carter is a war-weary, former military ca... | 43.926995 | [{"name": "Walt Disney Pictures", "id": 2}] | [{"iso\_3166\_1": "US", "name": "United States o... | 2012-03-07 | 284139100 | 132.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | Lost in our world, found in another. | John Carter | 6.1 | 2124 |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **4798** | 220000 | [{"id": 28, "name": "Action"}, {"id": 80, "nam... | NaN | 9367 | [{"id": 5616, "name": "united states\u2013mexi... | es | El Mariachi | El Mariachi just wants to play his guitar and ... | 14.269792 | [{"name": "Columbia Pictures", "id": 5}] | [{"iso\_3166\_1": "MX", "name": "Mexico"}, {"iso... | 1992-09-04 | 2040920 | 81.0 | [{"iso\_639\_1": "es", "name": "Espa\u00f1ol"}] | Released | He didn't come looking for trouble, but troubl... | El Mariachi | 6.6 | 238 |
| **4799** | 9000 | [{"id": 35, "name": "Comedy"}, {"id": 10749, "... | NaN | 72766 | [] | en | Newlyweds | A newlywed couple's honeymoon is upended by th... | 0.642552 | [] | [] | 2011-12-26 | 0 | 85.0 | [] | Released | A newlywed couple's honeymoon is upended by th... | Newlyweds | 5.9 | 5 |
| **4800** | 0 | [{"id": 35, "name": "Comedy"}, {"id": 18, "nam... | http://www.hallmarkchannel.com/signedsealeddel... | 231617 | [{"id": 248, "name": "date"}, {"id": 699, "nam... | en | Signed, Sealed, Delivered | "Signed, Sealed, Delivered" introduces a dedic... | 1.444476 | [{"name": "Front Street Pictures", "id": 3958}... | [{"iso\_3166\_1": "US", "name": "United States o... | 2013-10-13 | 0 | 120.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | NaN | Signed, Sealed, Delivered | 7.0 | 6 |
| **4801** | 0 | [] | http://shanghaicalling.com/ | 126186 | [] | en | Shanghai Calling | When ambitious New York attorney Sam is sent t... | 0.857008 | [] | [{"iso\_3166\_1": "US", "name": "United States o... | 2012-05-03 | 0 | 98.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | A New Yorker in Shanghai | Shanghai Calling | 5.7 | 7 |
| **4802** | 0 | [{"id": 99, "name": "Documentary"}] | NaN | 25975 | [{"id": 1523, "name": "obsession"}, {"id": 224... | en | My Date with Drew | Ever since the second grade when he first saw ... | 1.929883 | [{"name": "rusty bear entertainment", "id": 87... | [{"iso\_3166\_1": "US", "name": "United States o... | 2005-08-05 | 0 | 90.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | NaN | My Date with Drew | 6.3 | 16 |

4803 rows × 20 columns

In [4]:

movies**.**columns

Out[4]:

Index(['budget', 'genres', 'homepage', 'id', 'keywords', 'original\_language',

'original\_title', 'overview', 'popularity', 'production\_companies',

'production\_countries', 'release\_date', 'revenue', 'runtime',

'spoken\_languages', 'status', 'tagline', 'title', 'vote\_average',

'vote\_count'],

dtype='object')

In [5]:

credits**=**pd**.**read\_csv("tmdb\_5000\_credits.csv")

In [6]:

credits

Out[6]:

|  | **movie\_id** | **title** | **cast** | **crew** |
| --- | --- | --- | --- | --- |
| **0** | 19995 | Avatar | [{"cast\_id": 242, "character": "Jake Sully", "... | [{"credit\_id": "52fe48009251416c750aca23", "de... |
| **1** | 285 | Pirates of the Caribbean: At World's End | [{"cast\_id": 4, "character": "Captain Jack Spa... | [{"credit\_id": "52fe4232c3a36847f800b579", "de... |
| **2** | 206647 | Spectre | [{"cast\_id": 1, "character": "James Bond", "cr... | [{"credit\_id": "54805967c3a36829b5002c41", "de... |
| **3** | 49026 | The Dark Knight Rises | [{"cast\_id": 2, "character": "Bruce Wayne / Ba... | [{"credit\_id": "52fe4781c3a36847f81398c3", "de... |
| **4** | 49529 | John Carter | [{"cast\_id": 5, "character": "John Carter", "c... | [{"credit\_id": "52fe479ac3a36847f813eaa3", "de... |
| **...** | ... | ... | ... | ... |
| **4798** | 9367 | El Mariachi | [{"cast\_id": 1, "character": "El Mariachi", "c... | [{"credit\_id": "52fe44eec3a36847f80b280b", "de... |
| **4799** | 72766 | Newlyweds | [{"cast\_id": 1, "character": "Buzzy", "credit\_... | [{"credit\_id": "52fe487dc3a368484e0fb013", "de... |
| **4800** | 231617 | Signed, Sealed, Delivered | [{"cast\_id": 8, "character": "Oliver O\u2019To... | [{"credit\_id": "52fe4df3c3a36847f8275ecf", "de... |
| **4801** | 126186 | Shanghai Calling | [{"cast\_id": 3, "character": "Sam", "credit\_id... | [{"credit\_id": "52fe4ad9c3a368484e16a36b", "de... |
| **4802** | 25975 | My Date with Drew | [{"cast\_id": 3, "character": "Herself", "credi... | [{"credit\_id": "58ce021b9251415a390165d9", "de... |

4803 rows × 4 columns

In [7]:

movies**.**head()

Out[7]:

|  | **budget** | **genres** | **homepage** | **id** | **keywords** | **original\_language** | **original\_title** | **overview** | **popularity** | **production\_companies** | **production\_countries** | **release\_date** | **revenue** | **runtime** | **spoken\_languages** | **status** | **tagline** | **title** | **vote\_average** | **vote\_count** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | 237000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.avatarmovie.com/ | 19995 | [{"id": 1463, "name": "culture clash"}, {"id":... | en | Avatar | In the 22nd century, a paraplegic Marine is di... | 150.437577 | [{"name": "Ingenious Film Partners", "id": 289... | [{"iso\_3166\_1": "US", "name": "United States o... | 2009-12-10 | 2787965087 | 162.0 | [{"iso\_639\_1": "en", "name": "English"}, {"iso... | Released | Enter the World of Pandora. | Avatar | 7.2 | 11800 |
| **1** | 300000000 | [{"id": 12, "name": "Adventure"}, {"id": 14, "... | http://disney.go.com/disneypictures/pirates/ | 285 | [{"id": 270, "name": "ocean"}, {"id": 726, "na... | en | Pirates of the Caribbean: At World's End | Captain Barbossa, long believed to be dead, ha... | 139.082615 | [{"name": "Walt Disney Pictures", "id": 2}, {"... | [{"iso\_3166\_1": "US", "name": "United States o... | 2007-05-19 | 961000000 | 169.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | At the end of the world, the adventure begins. | Pirates of the Caribbean: At World's End | 6.9 | 4500 |
| **2** | 245000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.sonypictures.com/movies/spectre/ | 206647 | [{"id": 470, "name": "spy"}, {"id": 818, "name... | en | Spectre | A cryptic message from Bond’s past sends him o... | 107.376788 | [{"name": "Columbia Pictures", "id": 5}, {"nam... | [{"iso\_3166\_1": "GB", "name": "United Kingdom"... | 2015-10-26 | 880674609 | 148.0 | [{"iso\_639\_1": "fr", "name": "Fran\u00e7ais"},... | Released | A Plan No One Escapes | Spectre | 6.3 | 4466 |
| **3** | 250000000 | [{"id": 28, "name": "Action"}, {"id": 80, "nam... | http://www.thedarkknightrises.com/ | 49026 | [{"id": 849, "name": "dc comics"}, {"id": 853,... | en | The Dark Knight Rises | Following the death of District Attorney Harve... | 112.312950 | [{"name": "Legendary Pictures", "id": 923}, {"... | [{"iso\_3166\_1": "US", "name": "United States o... | 2012-07-16 | 1084939099 | 165.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | The Legend Ends | The Dark Knight Rises | 7.6 | 9106 |
| **4** | 260000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://movies.disney.com/john-carter | 49529 | [{"id": 818, "name": "based on novel"}, {"id":... | en | John Carter | John Carter is a war-weary, former military ca... | 43.926995 | [{"name": "Walt Disney Pictures", "id": 2}] | [{"iso\_3166\_1": "US", "name": "United States o... | 2012-03-07 | 284139100 | 132.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | Lost in our world, found in another. | John Carter | 6.1 | 2124 |

In [8]:

movies**.**head(1)

Out[8]:

|  | **budget** | **genres** | **homepage** | **id** | **keywords** | **original\_language** | **original\_title** | **overview** | **popularity** | **production\_companies** | **production\_countries** | **release\_date** | **revenue** | **runtime** | **spoken\_languages** | **status** | **tagline** | **title** | **vote\_average** | **vote\_count** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | 237000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.avatarmovie.com/ | 19995 | [{"id": 1463, "name": "culture clash"}, {"id":... | en | Avatar | In the 22nd century, a paraplegic Marine is di... | 150.437577 | [{"name": "Ingenious Film Partners", "id": 289... | [{"iso\_3166\_1": "US", "name": "United States o... | 2009-12-10 | 2787965087 | 162.0 | [{"iso\_639\_1": "en", "name": "English"}, {"iso... | Released | Enter the World of Pandora. | Avatar | 7.2 | 11800 |

In [9]:

credits**.**head(1)

Out[9]:

|  | **movie\_id** | **title** | **cast** | **crew** |
| --- | --- | --- | --- | --- |
| **0** | 19995 | Avatar | [{"cast\_id": 242, "character": "Jake Sully", "... | [{"credit\_id": "52fe48009251416c750aca23", "de... |

In [10]:

credits**.**head(1)**.**values

Out[10]:

array([[19995, 'Avatar',

'[{"cast\_id": 242, "character": "Jake Sully", "credit\_id": "5602a8a7c3a3685532001c9a", "gender": 2, "id": 65731, "name": "Sam Worthington", "order": 0}, {"cast\_id": 3, "character": "Neytiri", "credit\_id": "52fe48009251416c750ac9cb", "gender": 1, "id": 8691, "name": "Zoe Saldana", "order": 1}, {"cast\_id": 25, "character": "Dr. Grace Augustine", "credit\_id": "52fe48009251416c750aca39", "gender": 1, "id": 10205, "name": "Sigourney Weaver", "order": 2}, {"cast\_id": 4, "character": "Col. Quaritch", "credit\_id": "52fe48009251416c750ac9cf", "gender": 2, "id": 32747, "name": "Stephen Lang", "order": 3}, {"cast\_id": 5, "character": "Trudy Chacon", "credit\_id": "52fe48009251416c750ac9d3", "gender": 1, "id": 17647, "name": "Michelle Rodriguez", "order": 4}, {"cast\_id": 8, "character": "Selfridge", "credit\_id": "52fe48009251416c750ac9e1", "gender": 2, "id": 1771, "name": "Giovanni Ribisi", "order": 5}, {"cast\_id": 7, "character": "Norm Spellman", "credit\_id": "52fe48009251416c750ac9dd", "gender": 2, "id": 59231, "name": "Joel David Moore", "order": 6}, {"cast\_id": 9, "character": "Moat", "credit\_id": "52fe48009251416c750ac9e5", "gender": 1, "id": 30485, "name": "CCH Pounder", "order": 7}, {"cast\_id": 11, "character": "Eytukan", "credit\_id": "52fe48009251416c750ac9ed", "gender": 2, "id": 15853, "name": "Wes Studi", "order": 8}, {"cast\_id": 10, "character": "Tsu\'Tey", "credit\_id": "52fe48009251416c750ac9e9", "gender": 2, "id": 10964, "name": "Laz Alonso", "order": 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In [13]:

movies**.**shape

Out[13]:

(4803, 20)

In [14]:

credits**.**shape

Out[14]:

(4803, 4)

In [15]:

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

In [16]:

movies

Out[16]:

|  | **budget** | **genres** | **homepage** | **id** | **keywords** | **original\_language** | **original\_title** | **overview** | **popularity** | **production\_companies** | **...** | **runtime** | **spoken\_languages** | **status** | **tagline** | **title** | **vote\_average** | **vote\_count** | **movie\_id** | **cast** | **crew** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
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| **3** | 250000000 | [{"id": 28, "name": "Action"}, {"id": 80, "nam... | http://www.thedarkknightrises.com/ | 49026 | [{"id": 849, "name": "dc comics"}, {"id": 853,... | en | The Dark Knight Rises | Following the death of District Attorney Harve... | 112.312950 | [{"name": "Legendary Pictures", "id": 923}, {"... | ... | 165.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | The Legend Ends | The Dark Knight Rises | 7.6 | 9106 | 49026 | [{"cast\_id": 2, "character": "Bruce Wayne / Ba... | [{"credit\_id": "52fe4781c3a36847f81398c3", "de... |
| **4** | 260000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://movies.disney.com/john-carter | 49529 | [{"id": 818, "name": "based on novel"}, {"id":... | en | John Carter | John Carter is a war-weary, former military ca... | 43.926995 | [{"name": "Walt Disney Pictures", "id": 2}] | ... | 132.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | Lost in our world, found in another. | John Carter | 6.1 | 2124 | 49529 | [{"cast\_id": 5, "character": "John Carter", "c... | [{"credit\_id": "52fe479ac3a36847f813eaa3", "de... |
| **...** | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |
| **4804** | 220000 | [{"id": 28, "name": "Action"}, {"id": 80, "nam... | NaN | 9367 | [{"id": 5616, "name": "united states\u2013mexi... | es | El Mariachi | El Mariachi just wants to play his guitar and ... | 14.269792 | [{"name": "Columbia Pictures", "id": 5}] | ... | 81.0 | [{"iso\_639\_1": "es", "name": "Espa\u00f1ol"}] | Released | He didn't come looking for trouble, but troubl... | El Mariachi | 6.6 | 238 | 9367 | [{"cast\_id": 1, "character": "El Mariachi", "c... | [{"credit\_id": "52fe44eec3a36847f80b280b", "de... |
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| **4807** | 0 | [] | http://shanghaicalling.com/ | 126186 | [] | en | Shanghai Calling | When ambitious New York attorney Sam is sent t... | 0.857008 | [] | ... | 98.0 | [{"iso\_639\_1": "en", "name": "English"}] | Released | A New Yorker in Shanghai | Shanghai Calling | 5.7 | 7 | 126186 | [{"cast\_id": 3, "character": "Sam", "credit\_id... | [{"credit\_id": "52fe4ad9c3a368484e16a36b", "de... |
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4809 rows × 23 columns

In [17]:

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Out[17]:

(4809, 23)

In [18]:

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original\_language

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fr 70

es 32

zh 27

de 27

hi 19

ja 16

it 14

ko 12

cn 12

ru 11

pt 9

da 7

sv 5

nl 4

fa 4

th 3

he 3

ta 2

cs 2

ro 2

id 2

ar 2

vi 1

sl 1

ps 1

no 1

ky 1

hu 1

pl 1

af 1

nb 1

tr 1

is 1

xx 1

te 1

el 1

Name: count, dtype: int64

In [19]:

movies**.**head(1)

Out[19]:

|  | **budget** | **genres** | **homepage** | **id** | **keywords** | **original\_language** | **original\_title** | **overview** | **popularity** | **production\_companies** | **...** | **runtime** | **spoken\_languages** | **status** | **tagline** | **title** | **vote\_average** | **vote\_count** | **movie\_id** | **cast** | **crew** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0** | 237000000 | [{"id": 28, "name": "Action"}, {"id": 12, "nam... | http://www.avatarmovie.com/ | 19995 | [{"id": 1463, "name": "culture clash"}, {"id":... | en | Avatar | In the 22nd century, a paraplegic Marine is di... | 150.437577 | [{"name": "Ingenious Film Partners", "id": 289... | ... | 162.0 | [{"iso\_639\_1": "en", "name": "English"}, {"iso... | Released | Enter the World of Pandora. | Avatar | 7.2 | 11800 | 19995 | [{"cast\_id": 242, "character": "Jake Sully", "... | [{"credit\_id": "52fe48009251416c750aca23", "de... |

1 rows × 23 columns

In [20]:

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movies

Out[20]:

|  | **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": "52fe479ac3a36847f813eaa3", "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 O\u2019To... | [{"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 [21]:

movies**.**info()

<class 'pandas.core.frame.DataFrame'>

RangeIndex: 4809 entries, 0 to 4808

Data columns (total 7 columns):

# Column Non-Null Count Dtype

--- ------ -------------- -----

0 movie\_id 4809 non-null int64

1 title 4809 non-null object

2 overview 4806 non-null object

3 genres 4809 non-null object

4 keywords 4809 non-null object

5 cast 4809 non-null object

6 crew 4809 non-null object

dtypes: int64(1), object(6)

memory usage: 263.1+ KB

In [22]:

movies**.**isnull()**.**sum()

Out[22]:

movie\_id 0

title 0

overview 3

genres 0

keywords 0

cast 0

crew 0

dtype: int64

In [23]:

movies**.**dropna(inplace**=True**)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\3786870272.py:1: SettingWithCopyWarning:

A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy

movies.dropna(inplace=True)

In [24]:

movies**.**isnull()**.**sum()

Out[24]:

movie\_id 0

title 0

overview 0

genres 0

keywords 0

cast 0

crew 0

dtype: int64

In [25]:

movies**.**duplicated()**.**sum()

Out[25]:

0

In [26]:

movies**.**iloc[0]**.**genres

Out[26]:

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

In [27]:

**def** convert(ashmira):

L**=**[]

**for** i **in** ashmira:

L**.**append(i['name'])

**return** L

In [28]:

convert('genres')

**---------------------------------------------------------------------------**

**TypeError** Traceback (most recent call last)

Cell **In[28], line 1**

**----> 1** convert('genres')

Cell **In[27], line 4**, in convert**(ashmira)**

2 L=[]

3 **for** i **in** ashmira:

**----> 4** L.append(i['name'])

5 **return** L

**TypeError**: string indices must be integers, not 'str'

In [29]:

**import** ast

In [30]:

ast**.**literal\_eval('[{"id": 28, "name": "Action"}, {"id": 12, "name": "Adventure"}, {"id": 14, "name": "Fantasy"}, {"id": 878, "name": "Science Fiction"}]')

Out[30]:

[{'id': 28, 'name': 'Action'},

{'id': 12, 'name': 'Adventure'},

{'id': 14, 'name': 'Fantasy'},

{'id': 878, 'name': 'Science Fiction'}]

In [31]:

**def** convert(ashmira):

L**=**[]

**for** i **in** ast**.**literal\_eval(ashmira):

L**.**append(i['name'])

**return** L

In [ ]:

In [32]:

movies['genres']**=**movies['genres']**.**apply(convert)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\3750037503.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

movies['genres']=movies['genres'].apply(convert)

In [33]:

movies['genres']

Out[33]:

0 [Action, Adventure, Fantasy, Science Fiction]

1 [Adventure, Fantasy, Action]

2 [Action, Adventure, Crime]

3 [Action, Crime, Drama, Thriller]

4 [Action, Adventure, Science Fiction]

...

4804 [Action, Crime, Thriller]

4805 [Comedy, Romance]

4806 [Comedy, Drama, Romance, TV Movie]

4807 []

4808 [Documentary]

Name: genres, Length: 4806, dtype: object

In [34]:

movies**.**head()

Out[34]:

|  | **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... |

In [35]:

movies['keywords']**.**apply(convert)

Out[35]:

0 [culture clash, future, space war, space colon...

1 [ocean, drug abuse, exotic island, east india ...

2 [spy, based on novel, secret agent, sequel, mi...

3 [dc comics, crime fighter, terrorist, secret i...

4 [based on novel, mars, medallion, space travel...

...

4804 [united states–mexico barrier, legs, arms, pap...

4805 []

4806 [date, love at first sight, narration, investi...

4807 []

4808 [obsession, camcorder, crush, dream girl]

Name: keywords, Length: 4806, dtype: object

In [36]:

movies['keywords']**=**movies['keywords']**.**apply(convert)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\1621871954.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

movies['keywords']=movies['keywords'].apply(convert)

In [37]:

movies**.**head()

Out[37]:

|  | **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 [38]:

movies**.**iloc[0]**.**cast

Out[38]:

'[{"cast\_id": 242, "character": "Jake Sully", "credit\_id": "5602a8a7c3a3685532001c9a", "gender": 2, "id": 65731, "name": "Sam Worthington", "order": 0}, {"cast\_id": 3, "character": "Neytiri", "credit\_id": "52fe48009251416c750ac9cb", "gender": 1, "id": 8691, "name": "Zoe Saldana", "order": 1}, {"cast\_id": 25, "character": "Dr. Grace Augustine", "credit\_id": "52fe48009251416c750aca39", "gender": 1, "id": 10205, "name": "Sigourney Weaver", "order": 2}, {"cast\_id": 4, "character": "Col. Quaritch", "credit\_id": "52fe48009251416c750ac9cf", "gender": 2, "id": 32747, "name": "Stephen Lang", "order": 3}, {"cast\_id": 5, "character": "Trudy Chacon", "credit\_id": "52fe48009251416c750ac9d3", "gender": 1, "id": 17647, "name": "Michelle Rodriguez", "order": 4}, {"cast\_id": 8, "character": "Selfridge", "credit\_id": "52fe48009251416c750ac9e1", "gender": 2, "id": 1771, "name": "Giovanni Ribisi", "order": 5}, {"cast\_id": 7, "character": "Norm Spellman", "credit\_id": "52fe48009251416c750ac9dd", "gender": 2, "id": 59231, "name": "Joel David Moore", "order": 6}, {"cast\_id": 9, "character": "Moat", "credit\_id": "52fe48009251416c750ac9e5", "gender": 1, "id": 30485, "name": "CCH Pounder", "order": 7}, {"cast\_id": 11, "character": "Eytukan", "credit\_id": "52fe48009251416c750ac9ed", "gender": 2, "id": 15853, "name": "Wes Studi", "order": 8}, {"cast\_id": 10, "character": "Tsu\'Tey", "credit\_id": "52fe48009251416c750ac9e9", "gender": 2, "id": 10964, "name": "Laz Alonso", "order": 9}, {"cast\_id": 12, "character": "Dr. Max Patel", "credit\_id": "52fe48009251416c750ac9f1", "gender": 2, "id": 95697, "name": "Dileep Rao", "order": 10}, {"cast\_id": 13, "character": "Lyle Wainfleet", "credit\_id": "52fe48009251416c750ac9f5", "gender": 2, "id": 98215, "name": "Matt Gerald", "order": 11}, {"cast\_id": 32, "character": "Private Fike", "credit\_id": "52fe48009251416c750aca5b", "gender": 2, "id": 154153, "name": "Sean Anthony Moran", "order": 12}, {"cast\_id": 33, "character": "Cryo Vault Med Tech", "credit\_id": "52fe48009251416c750aca5f", "gender": 2, "id": 397312, "name": "Jason Whyte", "order": 13}, {"cast\_id": 34, "character": "Venture Star Crew Chief", "credit\_id": "52fe48009251416c750aca63", "gender": 2, "id": 42317, "name": "Scott Lawrence", "order": 14}, {"cast\_id": 35, "character": "Lock Up Trooper", "credit\_id": "52fe48009251416c750aca67", "gender": 2, "id": 986734, "name": "Kelly Kilgour", "order": 15}, {"cast\_id": 36, "character": "Shuttle Pilot", 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In [39]:

**def** convert2(ashmira):

L**=**[]

count**=**0

**for** i **in** ast**.**literal\_eval(ashmira):

**if** count**<**3:

L**.**append(i['name'])

count**=**count**+**1

**else**:

**break**

**return** L

In [40]:

movies['cast']**.**apply(convert2)

Out[40]:

0 [Sam Worthington, Zoe Saldana, Sigourney Weaver]

1 [Johnny Depp, Orlando Bloom, Keira Knightley]

2 [Daniel Craig, Christoph Waltz, Léa Seydoux]

3 [Christian Bale, Michael Caine, Gary Oldman]

4 [Taylor Kitsch, Lynn Collins, Samantha Morton]

...

4804 [Carlos Gallardo, Jaime de Hoyos, Peter Marqua...

4805 [Edward Burns, Kerry Bishé, Marsha Dietlein]

4806 [Eric Mabius, Kristin Booth, Crystal Lowe]

4807 [Daniel Henney, Eliza Coupe, Bill Paxton]

4808 [Drew Barrymore, Brian Herzlinger, Corey Feldman]

Name: cast, Length: 4806, dtype: object

In [41]:

movies['cast']**=**movies['cast']**.**apply(convert2)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\3552737409.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

movies['cast']=movies['cast'].apply(convert2)

In [42]:

movies**.**head()

Out[42]:

|  | **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] | [{"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 ... | [Johnny Depp, Orlando Bloom, Keira Knightley] | [{"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... | [Daniel Craig, Christoph Waltz, Léa Seydoux] | [{"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... | [Christian Bale, Michael Caine, Gary Oldman] | [{"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... | [Taylor Kitsch, Lynn Collins, Samantha Morton] | [{"credit\_id": "52fe479ac3a36847f813eaa3", "de... |

In [43]:

movies['crew'][0]

Out[43]:

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In [44]:

**def** convert4(ashmira):

L**=**[]

**for** i **in** ast**.**literal\_eval(ashmira):

**if** i['job']**==**'Director':

L**.**append(i['name'])

**break**

**return** L

In [45]:

movies['crew']**.**apply(convert4)

Out[45]:

0 [James Cameron]

1 [Gore Verbinski]

2 [Sam Mendes]

3 [Christopher Nolan]

4 [Andrew Stanton]

...

4804 [Robert Rodriguez]

4805 [Edward Burns]

4806 [Scott Smith]

4807 [Daniel Hsia]

4808 [Brian Herzlinger]

Name: crew, Length: 4806, dtype: object

In [46]:

movies['crew']**=**movies['crew']**.**apply(convert4)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\697940677.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

movies['crew']=movies['crew'].apply(convert4)

In [47]:

movies**.**head()

Out[47]:

|  | **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 [48]:

movies['overview'][0]

Out[48]:

'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.'

In [49]:

movies['overview']**.**apply(**lambda** x:x**.**split())

Out[49]:

0 [In, the, 22nd, century,, a, paraplegic, Marin...

1 [Captain, Barbossa,, long, believed, to, be, d...

2 [A, cryptic, message, from, Bond’s, past, send...

3 [Following, the, death, of, District, Attorney...

4 [John, Carter, is, a, war-weary,, former, mili...

...

4804 [El, Mariachi, just, wants, to, play, his, gui...

4805 [A, newlywed, couple's, honeymoon, is, upended...

4806 ["Signed,, Sealed,, Delivered", introduces, a,...

4807 [When, ambitious, New, York, attorney, Sam, is...

4808 [Ever, since, the, second, grade, when, he, fi...

Name: overview, Length: 4806, dtype: object

In [50]:

movies['overview']**=**movies['overview']**.**apply(**lambda** x:x**.**split())

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\1104793012.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

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

In [51]:

movies**.**head()

Out[51]:

|  | **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] |

In [52]:

movies['genres']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

Out[52]:

0 [Action, Adventure, Fantasy, ScienceFiction]

1 [Adventure, Fantasy, Action]

2 [Action, Adventure, Crime]

3 [Action, Crime, Drama, Thriller]

4 [Action, Adventure, ScienceFiction]

...

4804 [Action, Crime, Thriller]

4805 [Comedy, Romance]

4806 [Comedy, Drama, Romance, TVMovie]

4807 []

4808 [Documentary]

Name: genres, Length: 4806, dtype: object

In [53]:

movies['keywords']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

Out[53]:

0 [cultureclash, future, spacewar, spacecolony, ...

1 [ocean, drugabuse, exoticisland, eastindiatrad...

2 [spy, basedonnovel, secretagent, sequel, mi6, ...

3 [dccomics, crimefighter, terrorist, secretiden...

4 [basedonnovel, mars, medallion, spacetravel, p...

...

4804 [unitedstates–mexicobarrier, legs, arms, paper...

4805 []

4806 [date, loveatfirstsight, narration, investigat...

4807 []

4808 [obsession, camcorder, crush, dreamgirl]

Name: keywords, Length: 4806, dtype: object

In [54]:

movies['crew']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

Out[54]:

0 [JamesCameron]

1 [GoreVerbinski]

2 [SamMendes]

3 [ChristopherNolan]

4 [AndrewStanton]

...

4804 [RobertRodriguez]

4805 [EdwardBurns]

4806 [ScottSmith]

4807 [DanielHsia]

4808 [BrianHerzlinger]

Name: crew, Length: 4806, dtype: object

In [55]:

movies['cast']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

Out[55]:

0 [SamWorthington, ZoeSaldana, SigourneyWeaver]

1 [JohnnyDepp, OrlandoBloom, KeiraKnightley]

2 [DanielCraig, ChristophWaltz, LéaSeydoux]

3 [ChristianBale, MichaelCaine, GaryOldman]

4 [TaylorKitsch, LynnCollins, SamanthaMorton]

...

4804 [CarlosGallardo, JaimedeHoyos, PeterMarquardt]

4805 [EdwardBurns, KerryBishé, MarshaDietlein]

4806 [EricMabius, KristinBooth, CrystalLowe]

4807 [DanielHenney, ElizaCoupe, BillPaxton]

4808 [DrewBarrymore, BrianHerzlinger, CoreyFeldman]

Name: cast, Length: 4806, dtype: object

In [56]:

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['crew']**=**movies['crew']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

movies['cast']**=**movies['cast']**.**apply(**lambda** x:[i**.**replace(" ","") **for** i **in** x])

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\2711220669.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

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

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\2711220669.py:2: 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

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

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\2711220669.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

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

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\2711220669.py:4: 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

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

In [57]:

movies**.**head()

Out[57]:

|  | **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] |

In [58]:

movies["Tags"]**=**movies["overview"]**+**movies['genres']**+**movies['keywords']**+**movies['cast']**+**movies['crew']

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\1373439649.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

movies["Tags"]=movies["overview"]+movies['genres']+movies['keywords']+movies['cast']+movies['crew']

In [59]:

movies**.**head()

Out[59]:

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

In [60]:

movies["Tags"][0]

Out[60]:

['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',

'cultureclash',

'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 [61]:

new\_df**=**movies[['movie\_id','title','Tags']]

In [62]:

new\_df

Out[62]:

|  | **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 [63]:

new\_df["Tags"]**=**new\_df["Tags"]**.**apply(**lambda** x:" "**.**join(x))

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\1419722377.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 [64]:

new\_df**.**head()

Out[64]:

|  | **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 [65]:

new\_df["Tags"]**=**new\_df["Tags"]**.**apply(**lambda** x:x**.**lower())

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\719741449.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 [66]:

new\_df**.**head()

Out[66]:

|  | **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 [67]:

new\_df['Tags'][1]

Out[67]:

"captain barbossa, long believed to be dead, has come back to life and is headed to the edge of the earth with will turner and elizabeth swann. but nothing is quite as it seems. adventure fantasy action ocean drugabuse exoticisland eastindiatradingcompany loveofone'slife traitor shipwreck strongwoman ship alliance calypso afterlife fighter pirate swashbuckler aftercreditsstinger johnnydepp orlandobloom keiraknightley goreverbinski"

In [68]:

**from** sklearn.feature\_extraction.text **import** CountVectorizer

In [69]:

cv**=**CountVectorizer(max\_features**=**5000,stop\_words**=**'english')

In [70]:

cv**.**fit\_transform(new\_df['Tags'])**.**toarray()

Out[70]:

array([[0, 0, 0, ..., 0, 0, 0],

[0, 0, 0, ..., 0, 0, 0],

[0, 0, 0, ..., 0, 0, 0],

...,

[0, 0, 0, ..., 0, 0, 0],

[0, 0, 0, ..., 0, 0, 0],

[0, 0, 0, ..., 0, 0, 0]], dtype=int64)

In [71]:

vector**=**cv**.**fit\_transform(new\_df['Tags'])**.**toarray()

In [72]:

vector[0]

Out[72]:

array([0, 0, 0, ..., 0, 0, 0], dtype=int64)

In [73]:

cv**.**get\_feature\_names

**---------------------------------------------------------------------------**

**AttributeError** Traceback (most recent call last)

Cell **In[73], line 1**

**----> 1** cv.get\_feature\_names

**AttributeError**: 'CountVectorizer' object has no attribute 'get\_feature\_names'

In [74]:

**import** nltk

**from** nltk.stem.porter **import** PorterStemmer

ps**=** PorterStemmer()

**def** stem(text):

y**=**[]

**for** i **in** text**.**split():

y**.**append(ps**.**stem(i))

**return** " "**.**join(y)

In [75]:

new\_df['Tags']**.**apply(stem)

Out[75]:

0 in the 22nd century, a parapleg marin is dispa...

1 captain barbossa, long believ to be dead, ha c...

2 a cryptic messag from bond’ past send him on a...

3 follow the death of district attorney harvey d...

4 john carter is a war-weary, former militari ca...

...

4804 el mariachi just want to play hi guitar and ca...

4805 a newlyw couple' honeymoon is upend by the arr...

4806 "signed, sealed, delivered" introduc a dedic q...

4807 when ambiti new york attorney sam is sent to s...

4808 ever sinc the second grade when he first saw h...

Name: Tags, Length: 4806, dtype: object

In [76]:

new\_df['Tags']**=**new\_df['Tags']**.**apply(stem)

C:\Users\admin\AppData\Local\Temp\ipykernel\_5876\793828252.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 [77]:

new\_df**.**head()

Out[77]:

|  | **movie\_id** | **title** | **Tags** |
| --- | --- | --- | --- |
| **0** | 19995 | Avatar | in the 22nd century, a parapleg marin is dispa... |
| **1** | 285 | Pirates of the Caribbean: At World's End | captain barbossa, long believ to be dead, ha c... |
| **2** | 206647 | Spectre | a cryptic messag from bond’ past send him on a... |
| **3** | 49026 | The Dark Knight Rises | follow the death of district attorney harvey d... |
| **4** | 49529 | John Carter | john carter is a war-weary, former militari ca... |

In [78]:

**from** sklearn.metrics.pairwise **import** cosine\_similarity

In [79]:

cosine\_similarity(vector)

Out[79]:

array([[1. , 0.08964215, 0.05976143, ..., 0.02519763, 0.02817181,

0. ],

[0.08964215, 1. , 0.0625 , ..., 0.02635231, 0. ,

0. ],

[0.05976143, 0.0625 , 1. , ..., 0.02635231, 0. ,

0. ],

...,

[0.02519763, 0.02635231, 0.02635231, ..., 1. , 0.0745356 ,

0.04836508],

[0.02817181, 0. , 0. , ..., 0.0745356 , 1. ,

0.05407381],

[0. , 0. , 0. , ..., 0.04836508, 0.05407381,

1. ]])

In [80]:

similarity**=**cosine\_similarity(vector)

In [81]:

similarity[2]

Out[81]:

array([0.05976143, 0.0625 , 1. , ..., 0.02635231, 0. ,

0. ])

In [82]:

similarity[0]

Out[82]:

array([1. , 0.08964215, 0.05976143, ..., 0.02519763, 0.02817181,

0. ])

In [83]:

new\_df[new\_df['title']**==**'Avatar']**.**index[0]

Out[83]:

0

In [84]:

new\_df[new\_df['title']**==**'The Dark Knight Rises']**.**index[0]

Out[84]:

3

In [85]:

sorted(similarity[0],reverse**=True**)

Out[85]:

[1.0,

0.26089696604360174,

0.2581988897471611,

0.25302403842552984,

0.25110592822973776,

0.24944382578492943,

0.24397501823713333,

0.243599382882345,

0.23904572186687872,

0.2344036154692477,

0.22677868380553634,

0.2238868314198225,

0.22230800575069137,

0.22190115272469205,

0.22131333406899523,

0.2193633988428327,

0.2173253797873328,

0.21653278478430668,

0.2164218276749025,

0.2162249910469341,

0.2162249910469341,

0.21602468994692864,

0.21602468994692864,

0.21251185925162067,

0.2114722130550724,

0.21147221305507238,

0.21096325392232296,

0.2059714602177749,

0.20291986247835692,

0.202837021134844,

0.19920476822239894,

0.19889806323953876,

0.1980534816610477,

0.19518001458970666,

0.19518001458970666,

0.19451950503185494,

0.1938916835823703,

0.19320245583349133,

0.19317811536651805,

0.1916629694999819,

0.1901597073139162,

0.18935242733246033,

0.1889822365046136,

0.18832944617230335,

0.18832944617230335,

0.18708286933869706,

0.18478728707195913,

0.18478728707195913,

0.1831403087002079,

0.1825741858350554,

0.1825741858350554,

0.18018749253911176,

0.17928429140015903,

0.1765469659009499,

0.1763834207376394,

0.17622684421256032,

0.17445567519772937,

0.17251638983558856,

0.17251638983558856,

0.1717355162964367,

0.17142857142857143,

0.17142857142857143,

0.17036708399998393,

0.1690308509457033,

0.1690308509457033,

0.1690308509457033,

0.16903085094570328,

0.16903085094570328,

0.16574838603294897,

0.16574838603294897,

0.16408253082847338,

0.16265001215808886,

0.16265001215808886,

0.16239958858823,

0.16239958858823,

0.16035674514745463,

0.16035674514745463,

0.15971914124998493,

0.15694120514358612,

0.15694120514358612,

0.1564921592871903,

0.1553638665664663,

0.15430334996209188,

0.15289415743128765,

0.15289415743128765,

0.15289415743128765,

0.15179418517972906,

0.15179418517972906,

0.15179418517972906,

0.15118578920369088,

0.15118578920369088,

0.15026857675938213,

0.14953343588376802,

0.14754222271266348,

0.14754222271266348,

0.14754222271266348,

0.14638501094227999,

0.1456438162508838,

0.1449427589131121,

0.1449427589131121,

0.1449427589131121,

0.1449427589131121,

0.14414999403128942,

0.14414999403128942,

0.14414999403128942,

0.14414999403128942,

0.14414999403128942,

0.14285714285714285,

0.14201432049934523,

0.14098147537004826,

0.14085904245475275,

0.14085904245475275,

0.1406421692815486,

0.1406421692815486,

0.13930903806377162,

0.1389425035941821,

0.1389425035941821,

0.13801311186847084,

0.13801311186847084,

0.13801311186847084,

0.13801311186847084,

0.13801311186847082,

0.13710212427677043,

0.13710212427677043,

0.13710212427677043,

0.13662601021279464,

0.13662601021279464,

0.13552618543578768,

0.13533299049019168,

0.13533299049019168,

0.13533299049019168,

0.13522468075656266,

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...]

In [90]:

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

Out[90]:

[(539, 0.26089696604360174),

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In [98]:

**def** recommend(movie):

movie\_index**=**new\_df[new\_df['title']**==**movie]**.**index[0]

distaces**=**similarity[movie\_index]

movies\_list**=**sorted(list(enumerate( distaces)),reverse**=True**,key**=lambda** x:x[1])[1:6]

**for** i **in** movies\_list:

print(new\_df**.**iloc[i[0]]**.**title)

In [99]:

recommend('Avatar')

Titan A.E.

Small Soldiers

Independence Day

Ender's Game

Aliens vs Predator: Requiem

In [100]:

recommend('Avatar')

Titan A.E.

Small Soldiers

Independence Day

Ender's Game

Aliens vs Predator: Requiem

In [94]:

recommended('Spectre')

Quantum of Solace

Never Say Never Again

Skyfall

From Russia with Love

Thunderball

In [95]:

**import** pickle

In [96]:

pickle**.**dump(new\_df**.** to\_dict(),open("movie\_dict.pkl",'wb'))

In [97]:

pickle**.**dump(similarity,open("similarity.pkl",'wb'))

In [ ]: