

ANUJ YADAV PROJECT 10(Movie Recommendation)

Import Library

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

In [2]: import numpy as np
```

Import Dataset

```
In [3]: df=pd.read_csv('https://raw.githubusercontent.com/YBI-Foundation/Dataset/main/Movies

In [4]: df.head()
```

Out[4]:

	Movie_ID	Movie_Title	Movie_Genre	Movie_Language	Movie_Budget	Movie_Popularity	Movie_F
0	1	Four Rooms	Crime Comedy	en	4000000	22.876230	
1	2	Star Wars	Adventure Action Science Fiction	en	11000000	126.393695	
2	3	Finding Nemo	Animation Family	en	94000000	85.688789	
3	4	Forrest Gump	Comedy Drama Romance	en	55000000	138.133331	
4	5	American Beauty	Drama	en	15000000	80.878605	

5 rows × 21 columns

In [5]:

`df.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4760 entries, 0 to 4759
Data columns (total 21 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Movie_ID                             4760 non-null   int64
1   Movie_Title                          4760 non-null   object
2   Movie_Genre                          4760 non-null   object
3   Movie_Language                       4760 non-null   object
4   Movie_Budget                         4760 non-null   int64
5   Movie_Popularity                     4760 non-null   float64
6   Movie_Release_Date                  4760 non-null   object
7   Movie_Revenue                       4760 non-null   int64
8   Movie_Runtime                       4758 non-null   float64
9   Movie_Vote                          4760 non-null   float64
10  Movie_Vote_Count                    4760 non-null   int64
11  Movie_Homepage                      1699 non-null   object
12  Movie_Keywords                      4373 non-null   object
13  Movie_Overview                      4757 non-null   object
14  Movie_Production_House              4760 non-null   object
15  Movie_Production_Country            4760 non-null   object
16  Movie_Spoken_Language               4760 non-null   object
17  Movie_Tagline                       3942 non-null   object
18  Movie_Cast                          4733 non-null   object
19  Movie_Crew                          4760 non-null   object
20  Movie_Director                      4738 non-null   object
dtypes: float64(3), int64(4), object(14)
memory usage: 781.1+ KB
```

In [6]:

`df.shape`

Out[6]: (4760, 21)

In [7]:

`df.columns`

```
Out[7]: Index(['Movie_ID', 'Movie_Title', 'Movie_Genre', 'Movie_Language',
             'Movie_Budget', 'Movie_Popularity', 'Movie_Release_Date',
             'Movie_Revenue', 'Movie_Runtime', 'Movie_Vote', 'Movie_Vote_Count',
             'Movie_Homepage', 'Movie_Keywords', 'Movie_Overview',
             'Movie_Production_House', 'Movie_Production_Country',
             'Movie_Spoken_Language', 'Movie_Tagline', 'Movie_Cast', 'Movie_Crew',
             'Movie_Director'],
            dtype='object')
```

Get Feature Selection

In [8]:

`df_features = df[['Movie_Genre', 'Movie_Keywords', 'Movie_Tagline', 'Movie_Cast', 'Movie`

In [9]:

`df_features.shape`

Out[9]: (4760, 5)

In [10]:

`df_features`

Out[10]:

	Movie_Genre	Movie_Keywords	Movie_Tagline	Movie_Cast	Movie_Director
0	Crime Comedy	hotel new year's eve witch bet hotel room	Twelve outrageous guests. Four scandalous requ...	Tim Roth Antonio Banderas Jennifer Beals Madon...	Allison Anders
1	Adventure Action Science Fiction	android galaxy hermit death star lightsaber	A long time ago in a galaxy far, far away...	Mark Hamill Harrison Ford Carrie Fisher Peter ...	George Lucas
2	Animation Family	father son relationship harbor underwater fish...	There are 3.7 trillion fish in the ocean, they...	Albert Brooks Ellen DeGeneres Alexander Gould ...	Andrew Stanton
3	Comedy Drama Romance	vietnam veteran hippie mentally disabled runni...	The world will never be the same, once you've ...	Tom Hanks Robin Wright Gary Sinise Mykelti Wil...	Robert Zemeckis
4	Drama	male nudity female nudity adultery midlife cri...	Look closer.	Kevin Spacey Annette Bening Thora Birch Wes Be...	Sam Mendes
...
4755	Horror		The hot spot where Satan's waitin'.	Lisa Hart Carroll Michael Des Barres Paul Drak...	Pece Dingo
4756	Comedy Family Drama		It's better to stand out than to fit in.	Roni Akurati Brighton Sharbino Jason Lee Anjul...	Frank Lotito
4757	Thriller Drama	christian film sex trafficking	She never knew it could happen to her...	Nicole Smolen Kim Baldwin Ariana Stephens Brys...	Jaco Booyens
4758	Family				
4759	Documentary	music actors legendary performer classic hollyw...		Tony Oppedisano	Simon Napier-Bell

4760 rows × 5 columns

In [11]:

```
x=df_features['Movie_Genre']+' '+df_features['Movie_Keywords']+' '+df_features['Movie_Tagline']+' '+df_features['Movie_Cast']+' '+df_features['Movie_Director']
```

In [12]:

```
x
```

Out[12]:

```
0      Crime Comedy hotel new year's eve witch bet ho...
1      Adventure Action Science Fiction android galax...
2      Animation Family father son relationship harbo...
3      Comedy Drama Romance vietnam veteran hippie me...
4      Drama male nudity female nudity adultery midli...
...
4755   Horror The hot spot where Satan's waitin'. Li...
4756   Comedy Family Drama It's better to stand out ...
4757   Thriller Drama christian film sex trafficking ...
4758   Family
4759   Documentary music actors legendary performer cl...
Length: 4760, dtype: object
```

```
In [13]: x.shape
```

```
Out[13]: (4760,)
```

Get Feature Text Conversion to Tokens

```
In [14]: from sklearn.feature_extraction.text import TfidfVectorizer
```

```
In [15]: tfidf = TfidfVectorizer()
```

```
In [16]: x = tfidf.fit_transform(x)
```

```
In [17]: x.shape
```

```
Out[17]: (4760, 17258)
```

```
In [18]: print(x)
```

```
(0, 617)      0.1633382144407513
(0, 492)      0.1432591540388685
(0, 15413)    0.1465525095337543
(0, 9675)     0.14226057295252661
(0, 9465)     0.1659841367820977
(0, 1390)     0.16898383612799558
(0, 7825)     0.09799561597509843
(0, 1214)     0.13865857545144072
(0, 729)      0.13415063359531618
(0, 13093)    0.1432591540388685
(0, 15355)    0.10477815972666779
(0, 9048)     0.0866842116160778
(0, 11161)    0.06250380151644369
(0, 16773)    0.17654247479915475
(0, 5612)     0.08603537588547631
(0, 16735)    0.10690083751525419
(0, 7904)     0.13348000542112332
(0, 15219)    0.09800472886453934
(0, 11242)    0.07277788238484746
(0, 3878)     0.11998399582562203
(0, 5499)     0.11454057510303811
(0, 7071)     0.19822417598406614
(0, 7454)     0.14745635785412262
(0, 1495)     0.19712637387361423
(0, 9206)     0.15186283580984414
:            :
(4757, 5455)  0.12491480594769522
(4757, 2967)  0.16273475835631626
(4757, 8464)  0.23522565554066333
(4757, 6938)  0.17088173678136628
(4757, 8379)  0.17480603856721913
(4757, 15303) 0.07654356007668191
(4757, 15384) 0.09754322497537371
(4757, 7649)  0.11479421494340192
(4757, 10896) 0.14546473055066447
(4757, 4494)  0.05675298448720501
(4758, 5238)  1.0
```

```
(4759, 11264) 0.33947721804318337
(4759, 11708) 0.33947721804318337
(4759, 205) 0.3237911628497312
(4759, 8902) 0.3040290704566037
(4759, 14062) 0.3237911628497312
(4759, 3058) 0.2812896191863103
(4759, 7130) 0.26419662449963793
(4759, 10761) 0.3126617295732147
(4759, 4358) 0.18306542312175342
(4759, 14051) 0.20084315377640435
(4759, 5690) 0.19534291014627303
(4759, 15431) 0.19628653185946862
(4759, 1490) 0.21197258705292082
(4759, 10666) 0.15888268987343043
```

Get similarity Score using Cosine Similarity

Cosine similarity computes the L2-normalized dot product of vectors Euclidean (L2) normalization projects the vectors onto the unit sphere, and their dot product is then the cosine of the angle between the points denoted by the vectors.

```
In [19]: from sklearn.metrics.pairwise import cosine_similarity
```

```
In [20]: similarity_score = cosine_similarity(x)
```

```
In [21]: similarity_score
```

```
Out[21]: array([[1.          , 0.01351235, 0.03570468, ..., 0.          , 0.          ,
        [0.01351235, 1.          , 0.00806674, ..., 0.          , 0.          ,
        [0.03570468, 0.00806674, 1.          , ..., 0.          , 0.08014876,
        ...,
        [0.          , 0.          , 0.          , ..., 1.          , 0.          ,
        [0.          , 0.          , 0.08014876, ..., 0.          , 1.          ,
        [0.          , 0.          , 0.          , ..., 0.          , 0.          ,
        [1.          , 1.          , 1.          , ..., 1.          , 1.          ]]])
```

```
In [22]: similarity_score.shape
```

```
Out[22]: (4760, 4760)
```

Get Movies name as Input from user and validate for Closest spelling

```
In [23]: Favourite_Movie_Name = input('Enter your favourite movie name:')
```

Enter your favourite movie name:avatar

```
In [24]: All_Movies_Title_List = df['Movie_Title'].tolist()
```

In [25]: `import difflib`

In [26]: `Movie_Recommendation = difflib.get_close_matches(Favourite_Movie_Name, All_Movies_Ti
print(Movie_Recommendation)`

['Avatar', 'Salvador', 'Water']

In [27]: `Close_Match = Movie_Recommendation[0]
print(Close_Match)`

Avatar

In [28]: `Index_of_Close_Match_Movie = df[df.Movie_Title == Close_Match]['Movie_ID'].values[0]
print(Index_of_Close_Match_Movie)`

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In [31]: `Recommendation_Score = list(enumerate(similarity_score[Index_of_Close_Match_Movie]))
print(Recommendation_Score)`

[(0, 0.009805093506053453), (1, 0.0), (2, 0.0), (3, 0.00800429043895183), (4, 0.0026759665928032302), (5, 0.009639835665946627), (6, 0.0049636657561850026), (7, 0.012848827437220958), (8, 0.0027543335470164663), (9, 0.00607882290416431), (10, 0.007539724639541887), (11, 0.0026263170118314906), (12, 0.002708340354961457), (13, 0.012904730427356216), (14, 0.0), (15, 0.022556564866386044), (16, 0.005959078936688496), (17, 0.0), (18, 0.013639824714195078), (19, 0.008784739948684396), (20, 0.0026527570934446066), (21, 0.015211614027840471), (22, 0.006522322352622825), (23, 0.0026429172195160193), (24, 0.0016564482636435309), (25, 0.025600660315408176), (26, 0.0024815199490618002), (27, 0.0047922703978129), (28, 0.0), (29, 0.023288277583204436), (30, 0.004648836119227042), (31, 0.006723965537835127), (32, 0.007984548069367697), (33, 0.018612326068635436), (34, 0.007439622267479848), (35, 0.0060612328203774185), (36, 0.0), (37, 0.0), (38, 0.008085428274959462), (39, 0.0046323263203813065), (40, 0.015305064222782005), (41, 0.0028220612513682524), (42, 0.007236825272071698), (43, 0.014851289474516489), (44, 0.03961780430399104), (45, 0.08999324643162435), (46, 0.01855499596172605), (47, 0.010374759033888029), (48, 0.015673410180680997), (49, 0.0), (50, 0.006986992676753986), (51, 0.014965979411782002), (52, 0.013600804094978335), (53, 0.0), (54, 0.0), (55, 0.0), (56, 0.006687995450791239), (57, 0.010835008478228547), (58, 0.0), (59, 0.0), (60, 0.007788672977779784), (61, 0.017658795452635247), (62, 0.10153560702418994), (63, 0.00724637379048299), (64, 0.0), (65, 0.031680929113056686), (66, 0.0025312341363153924), (67, 0.04506617878405939), (68, 0.022589410734540884), (69, 0.00506551508596364), (70, 0.012784303893544423), (71, 0.002598233031967091), (72, 0.011335815706635272), (73, 0.0), (74, 0.002697321222497816), (75, 0.012892746449532828), (76, 0.0037642771162936252), (77, 0.003476980872095499), (78, 0.009399606571884909), (79, 0.009076618790839581), (80, 0.004227109798982706), (81, 0.007009943535800456), (82, 0.011894144332662657), (83, 0.018501078945740605), (84, 0.0618237599684129), (85, 0.015565415762667165), (86, 0.011733847489721559), (87, 0.013731711116033066), (88, 0.022301178722772527), (89, 0.04014807769109404), (90, 0.004511298820312949), (91, 0.0), (92, 0.002231938202318901), (93, 0.004418656840322172), (94, 0.004236585948952706), (95, 0.004745609331166691), (96, 0.008895438584707134), (97, 0.002225672039651193), (98, 0.00248340938176191), (99, 0.01010872536394476), (100, 0.0), (101, 0.0), (102, 0.0050401893607578485), (103, 0.002196696924815654), (104, 0.00916249023695782), (105, 0.009532098755129267), (106, 0.017511756601740806), (107, 0.00810878589263473), (108, 0.03871190052571693), (109, 0.038488255428289986), (110, 0.08361784775029485), (111, 0.00892830755196627), (112, 0.028472602360715568), (113, 0.007487310843562389), (114, 0.002538593432573124), (115, 0.002593300200593264), (116, 0.02423134884513523), (117, 0.0), (118, 0.0047336369622742935), (119, 0.008932839836200659), (120, 0.009912331765059942), (121, 0.0023309647694089563), (122, 0.006517403480064114), (123, 0.018256088885426403), (124, 0.024984856011144883), (125, 0.012801531158627047), (126, 0.03803411394029396), (127, 0.0024694587388694603),

(128, 0.005117957196142506), (129, 0.0017710145837505121), (130, 0.011926867676679177), (131, 0.006655142039509908), (132, 0.0022485035909542398), (133, 0.0), (134, 0.0), (135, 0.004609422560900165), (136, 0.002342053663543897), (137, 0.052487743978234754), (138, 0.032196594696629596), (139, 0.00793805341964405), (140, 0.0023757143815839364), (141, 0.0), (142, 0.01924033807026037), (143, 0.0074218727251426225), (144, 0.017350164505517556), (145, 0.019128060100674707), (146, 0.0), (147, 0.01798970888682872), (148, 0.010606847740924956), (149, 0.011746502833415905), (150, 0.0), (151, 0.0), (152, 0.004480162377431886), (153, 0.0), (154, 0.002380610004741567), (155, 0.023537765450918877), (156, 0.007396517906534802), (157, 0.002415439486141447), (158, 0.002274967685727569), (159, 0.007126037020866246), (160, 0.018298437262288456), (161, 0.04350231968158566), (162, 0.007770799696963449), (163, 0.0), (164, 0.0086637829941784), (165, 0.002192430843204887), (166, 0.03236744328857419), (167, 0.026576509643169363), (168, 0.005162629015437511), (169, 0.002491783750451106), (170, 0.010590419372720969), (171, 0.0), (172, 0.041690425384126525), (173, 0.01695754465504918), (174, 0.030569480499441422), (175, 0.023330531483932517), (176, 0.027183803724459624), (177, 0.005599808753936733), (178, 0.002667965049488923), (179, 0.030707903325990372), (180, 0.007560424083753987), (181, 0.014055923457905324), (182, 0.009177613098031678), (183, 0.008350342502147893), (184, 0.0022333195719391554), (185, 0.03981648215324947), (186, 0.0), (187, 0.004046624716605281), (188, 0.0), (189, 0.004777355844485406), (190, 0.012138750265674795), (191, 0.00411617790201361), (192, 0.0027430559563033185), (193, 0.029212491040047014), (194, 0.002034839745506438), (195, 0.0021317422811621754), (196, 0.002130241788619929), (197, 0.00859704253241558), (198, 0.002573256321933336), (199, 0.018959792932713843), (200, 0.006317406038489515), (201, 0.012194922563079247), (202, 0.0016641723699352556), (203, 0.01692391575379628), (204, 0.018686269670332167), (205, 0.0), (206, 0.010195436607244203), (207, 0.013202287890523336), (208, 0.014564317291621241), (209, 0.016326637209159098), (210, 0.038872494075225), (211, 0.0026509436265181466), (212, 0.01673880855230024), (213, 0.049335863613711506), (214, 0.0), (215, 0.002491610501274281), (216, 0.009964319549763758), (217, 0.006895954353204596), (218, 0.016329345660994338), (219, 0.0), (220, 0.004877383327231498), (221, 0.002411361490287575), (222, 0.017856013028360415), (223, 0.0), (224, 0.007353548211987467), (225, 0.0), (226, 0.0025358335946023417), (227, 0.049272711641777656), (228, 0.0019207863172057056), (229, 0.002364464894441411), (230, 0.00639704758425901), (231, 0.013776482994224605), (232, 0.007072494943779912), (233, 0.004553254985288596), (234, 0.003970509617032526), (235, 0.0028626037655011655), (236, 0.013361417399169878), (237, 0.0), (238, 0.007292058096564207), (239, 0.004893411026998544), (240, 0.02640964525511218), (241, 0.02846230566947309), (242, 0.007883152373824122), (243, 0.009658171853199466), (244, 0.011434438545935371), (245, 0.0), (246, 0.002697163563809614), (247, 0.002507649315273456), (248, 0.006076898456420151), (249, 0.0022242181571218047), (250, 0.029605156266211453), (251, 0.013867966455367267), (252, 0.013883632146620802), (253, 0.0027728619056607952), (254, 0.06351452702158421), (255, 0.007486787644460759), (256, 0.007180422705514563), (257, 0.021804620814370096), (258, 0.0), (259, 0.0), (260, 0.004375759434559263), (261, 0.02232369294417245), (262, 0.0026643359555147046), (263, 0.006216251561942655), (264, 0.0), (265, 0.0), (266, 0.010555380119079246), (267, 0.0021492676003019005), (268, 0.0022620244651643815), (269, 0.024722211015322175), (270, 0.010051806221174025), (271, 0.010513499130038398), (272, 0.0), (273, 0.010851325289581416), (274, 0.011035641459288753), (275, 0.0), (276, 0.013412243036761688), (277, 0.04305955678902839), (278, 0.0021843202599993133), (279, 0.01674439634537899), (280, 0.016137762281668154), (281, 0.010850110374057989), (282, 0.05879285017883316), (283, 0.006663066484764481), (284, 0.027210766517313724), (285, 0.008704678727235576), (286, 0.0021763451606793822), (287, 0.015182057023698533), (288, 0.009496377944736414), (289, 0.003702706209227987), (290, 0.0037646025269972177), (291, 0.010654114070260626), (292, 0.05110461872364794), (293, 0.0018032932320903585), (294, 0.0036732829549063557), (295, 0.0037622811700992434), (296, 0.015204844606541184), (297, 0.0), (298, 0.0), (299, 0.0), (300, 0.006258139455269685), (301, 0.0069485776645648555), (302, 0.0), (303, 0.0050061679094136795), (304, 0.010776123342338816), (305, 0.004608912986979318), (306, 0.004250577618359522), (307, 0.008540452172185265), (308, 0.002836039428752784), (309, 0.007241873038964715), (310, 0.0044324607065052745), (311, 0.006640720103355573), (312, 0.0), (313, 0.011588694147227201), (314, 0.00386727864603967), (315, 0.0046275791609617966), (316, 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In [32]: `len(Recommendation_Score)`

Out[32]: 4760

Get All movies Sort Basis On Recommendation Score wrt Favourite Movie

In [35]: `#Sorting movies on their similarity
Sorted_Similar_Movies = sorted(Recommendation_Score , key = lambda x:x[1], reverse =
print(Sorted_Similar_Movies)`

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```

In [37]:

```
#print the name of similar movies based on the index
print ('Top 30 Movies Suggested for You : \n')

i = 1

for movie in Sorted_Similar_Movies:
    index = movie[0]
    title_from_index = df[df.index==index]['Movie_Title'].values[0]
```

```

if (i<31):
    print(i, '.',title_from_index)
    i+=1

```

Top 30 Movies Suggested for You :

- 1 . Niagara
- 2 . Caravans
- 3 . My Week with Marilyn
- 4 . Brokeback Mountain
- 5 . Harry Brown
- 6 . Night of the Living Dead
- 7 . The Curse of Downers Grove
- 8 . The Boy Next Door
- 9 . Back to the Future
- 10 . The Juror
- 11 . Some Like It Hot
- 12 . Enough
- 13 . The Kentucky Fried Movie
- 14 . Eye for an Eye
- 15 . Welcome to the Sticks
- 16 . Alice Through the Looking Glass
- 17 . Superman III
- 18 . The Misfits
- 19 . Premium Rush
- 20 . Duel in the Sun
- 21 . Sabotage
- 22 . Small Soldiers
- 23 . All That Jazz
- 24 . Camping Sauvage
- 25 . The Raid
- 26 . Beyond the Black Rainbow
- 27 . To Kill a Mockingbird
- 28 . World Trade Center
- 29 . The Dark Knight Rises
- 30 . Tora! Tora! Tora!

Top 10 Movies Recommendation System

```

In [ ]: Movie_Name = input('Enter Your Favourite Movie Name : ')

list_of_all_titles = df['Movie_Title'].tolist()

Find_Close_Match = difflib.get_close_matches(Movie_Name, list_of_all_titles)

Close_Match = Find_Close_Match[0]

Index_of_Movie = df[df.Movie_title == Close_Match]['Movie_ID'].values[0]

Recommendation_Score = list(enumerate(Similarity_Score[Index_of_Movie]))

sorted_similar_movies = sorted(Recommendation_Score , key = lambda x:x[1], reverse =

print('Top 10 Movies Suggested for You : \n ')

i = 1

for movie in sorted_similar_movies:
    index = movie[0]
    title_from_index = df[df.Movie_ID==index]['Movie_Title'].values
    if (i<11):

```

```
print(i, '.',title_from_index)  
i+=1
```

In []: