RIT

MOVIE RECOMMENDATION SYSTEM

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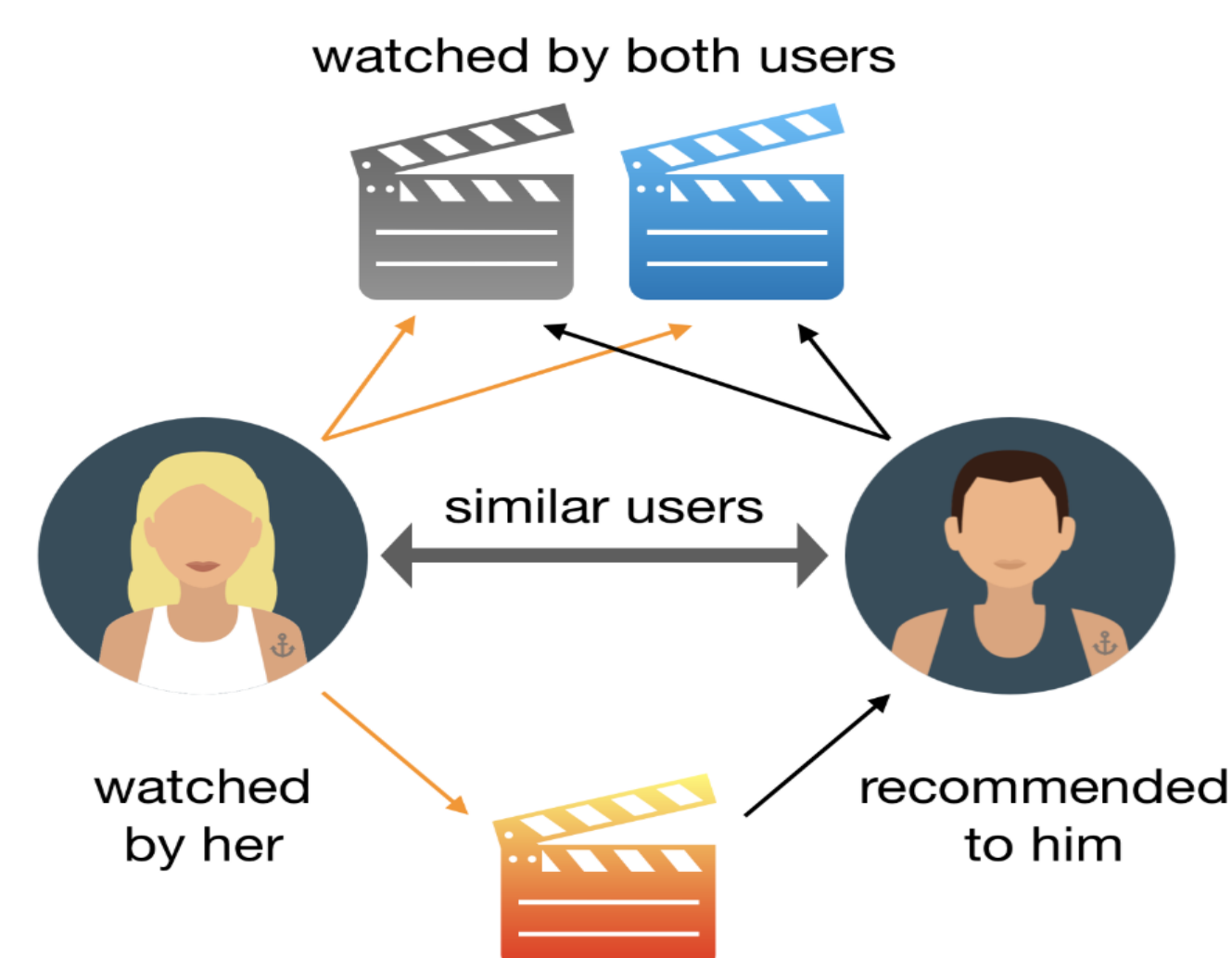## Recommender Systems

- ### Popularity Based
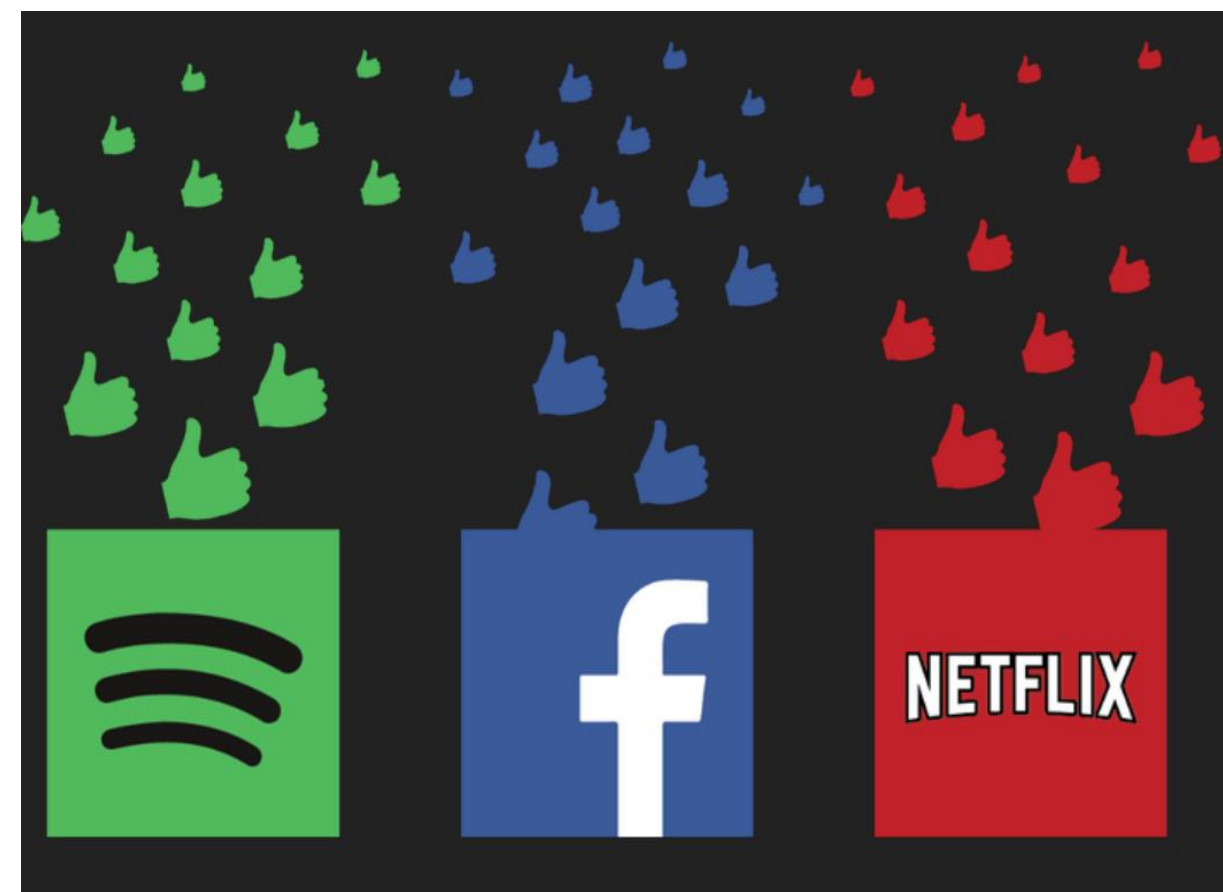
- ### Content Based
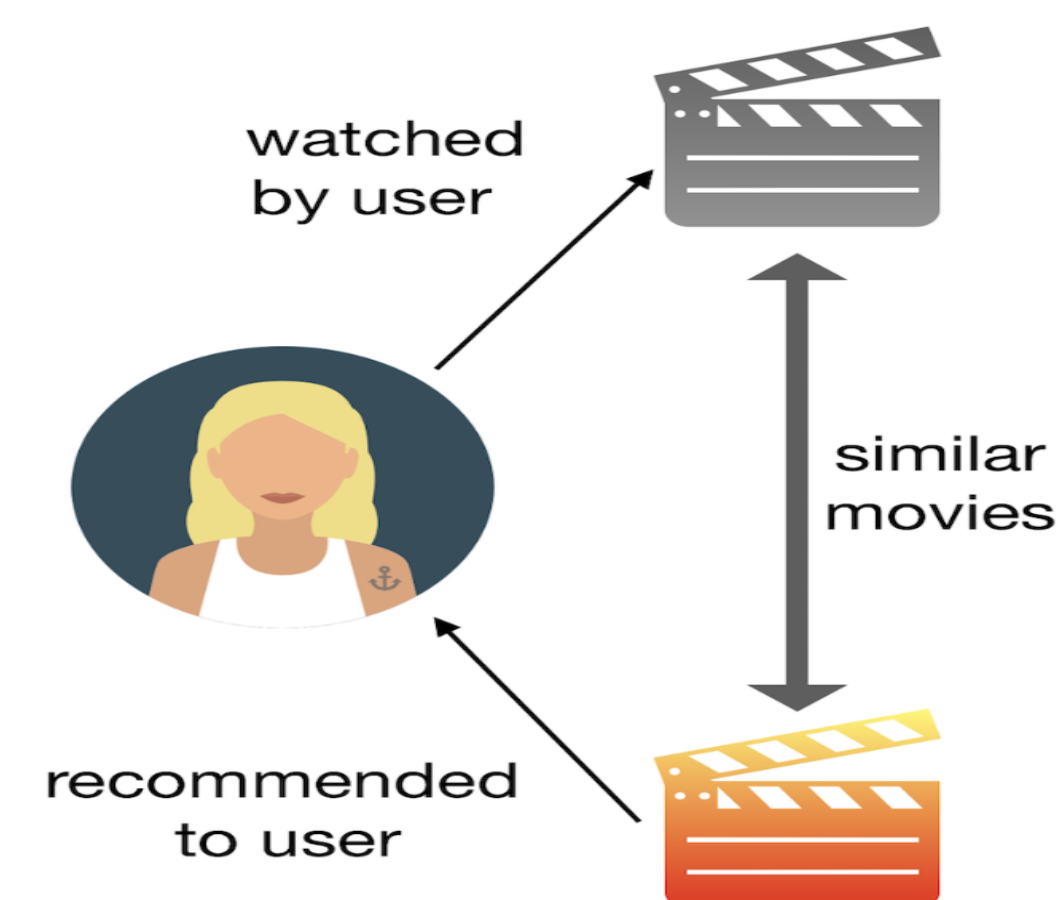
- ### Collaborative Filtering (User-Item)

Approach

- ### Weighted Rating

$$wr = \frac{v}{v+m} * R + \frac{m}{v+m} * C$$

v = number of votes for movie

m = minimum votes required to be listed

R = average rating of the movie

C = mean of vote average

- ### Cosine Similarity

Sentence A: Jack and Jill went up the hill.
Sentence B: Jill and Jack run down the hill.
Word Vector: [Jack, and, Jill, went, run, up, down, the, hill]
A-Vec: [1, 1, 1, 1, 0, 1, 0, 1, 1]
B-Vec: [1, 1, 1, 0, 1, 0, 1, 1, 1]

$$\text{cosine-sim} = \frac{(A\text{-}Vec)\cdot(B\text{-}Vec)}{\|(A\text{-}Vec)\|\,\|(B\text{-}Vec)\|} = \frac{5}{7} \approx .714$$

- ### Matrix Factorization using SVD

Results

- ### Popularity Based

	title	year	vote_count	vote_average	popularity	genres	wr
15480	Inception	2010	14075	8	29.1081	[Action, Thriller, Science Fiction, Mystery, A...	7.917588
12481	The Dark Knight	2008	12269	8	123.167	[Drama, Action, Crime, Thriller]	7.905871
22879	Interstellar	2014	11187	8	32.2135	[Adventure, Drama, Science Fiction]	7.897107
2843	Fight Club	1999	9678	8	63.8696	[Drama]	7.881753
4863	The Lord of the Rings: The Fellowship of the Ring	2001	8892	8	32.0707	[Adventure, Fantasy, Action]	7.871787
292	Pulp Fiction	1994	8670	8	140.95	[Thriller, Crime]	7.868660
314	The Shawshank Redemption	1994	8358	8	51.6454	[Drama, Crime]	7.864000

- ### Content Based

```
improved_recommendations('Inception')
```

	title	vote_count	vote_average	year	wr
6981	The Dark Knight	12269	8	2008	7.905871
8613	Interstellar	11187	8	2014	7.897107
6623	The Prestige	4510	8	2006	7.758148
3381	Memento	4168	8	2000	7.740175
8031	The Dark Knight Rises	9263	7	2012	6.921448
6218	Batman Begins	7511	7	2005	6.904127

- ### Collaborative Filtering

```
hybrid(1200,'Skyfall')
```

	title	vote_count	vote_average	year
2304	American Beauty	3438.0	7.9	1999
1298	The Hunt for Red October	971.0	7.2	1990
7240	Away We Go	189.0	6.7	2009
620	The Rock	1474.0	6.9	1996
8673	Mission: Impossible - Rogue Nation	3274.0	7.1	2015
6341	Jarhead	776.0	6.6	2005
6846	The Hunting Party	96.0	6.6	2007
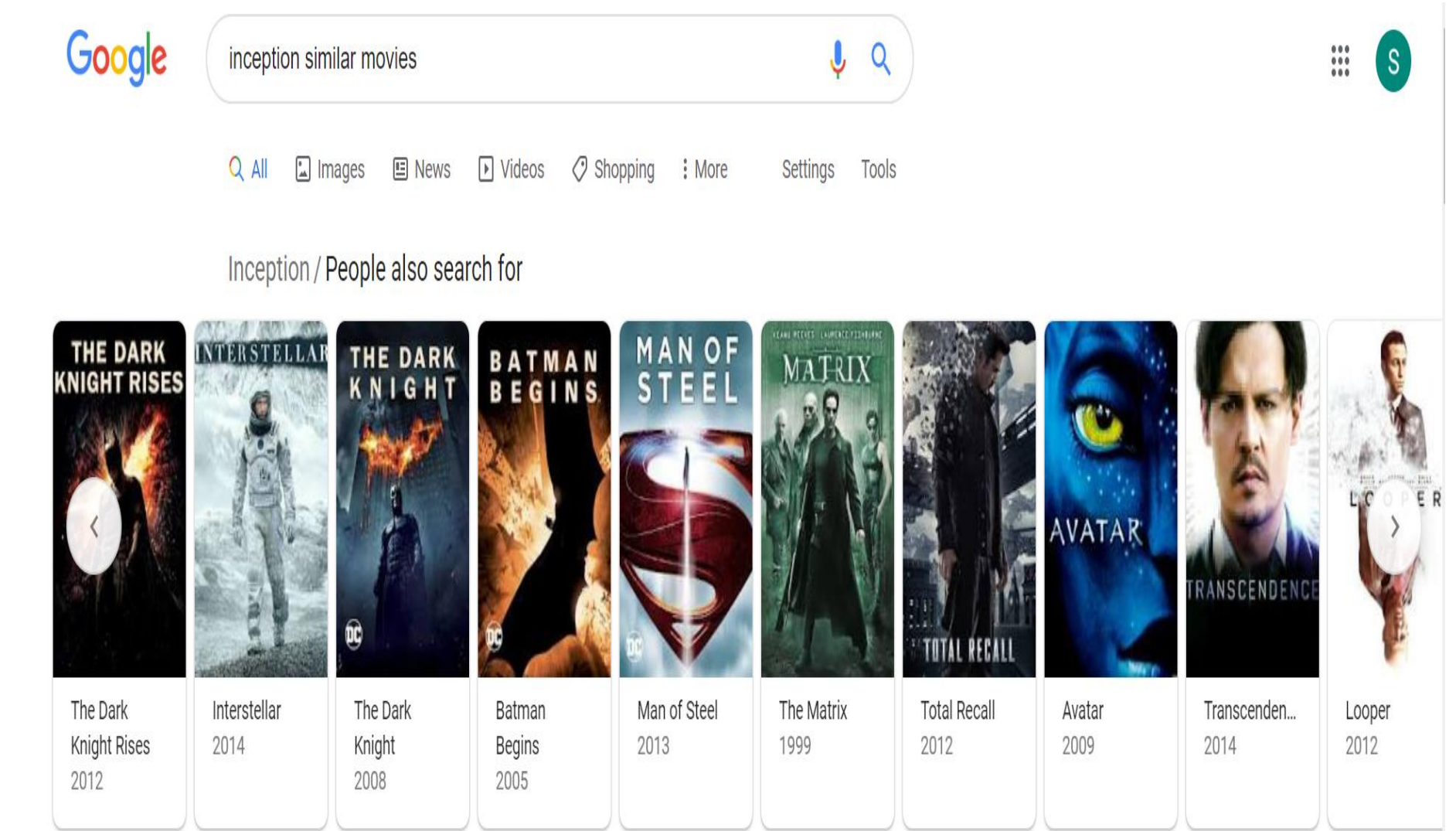
```
hybrid(56, "Skyfall")
```

	title	vote_count	vote_average	year
2304	American Beauty	3438.0	7.9	1999
9011	Spectre	4552.0	6.3	2015
7240	Away We Go	189.0	6.7	2009
620	The Rock	1474.0	6.9	1996
4185	Road to Perdition	1102.0	7.3	2002
4092	Breakout	16.0	6.4	1975
1298	The Hunt for Red October	971.0	7.2	1990