

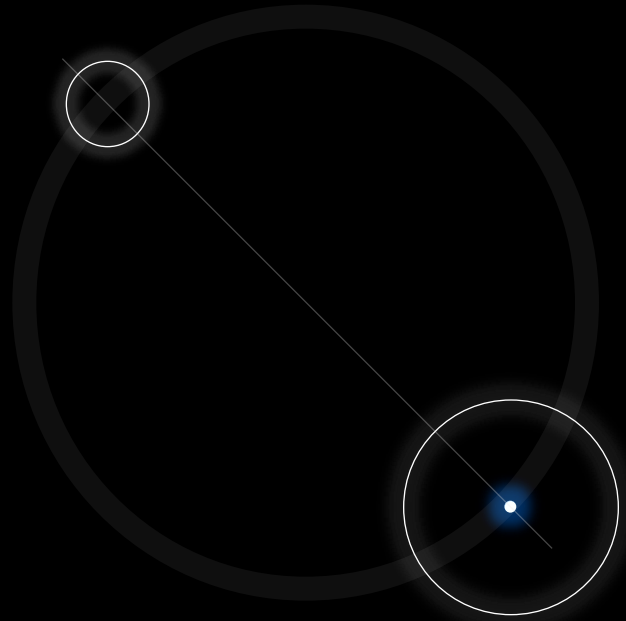
The background of the slide is a blurred night cityscape with various lights. The left half has a dark overlay with a grid of small dots. The right half shows a vertical strip of the city lights. The title 'MOVIE RECOMMENDATION SYSTEM' is centered in the dark area, with 'MOVIE' on the first line, 'RECOMMENDATION' on the second, and 'SYSTEM' on the third. There are decorative white circles and a dot around the text.

# MOVIE RECOMMENDATION SYSTEM

JIAPENG ZHANG

XIAO LIU

MALHAR KHIMSARIA



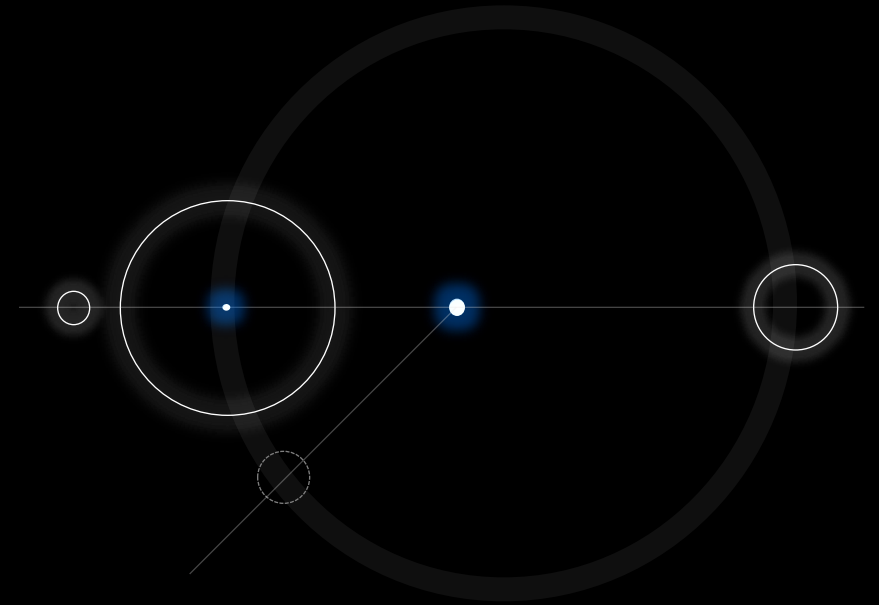
## PROJECT GOAL

In the "information overload" age, make an informed choice is hard. Too many choices often make people at a loss.

We present a movie recommendation system that helps to recommend movies for users based on collaborative filtering approach with KNN and KMeans clustering methods. This system can help users discover movies they might enjoy.

# OUTLINE

- Description
- Snapshots
- Project Stumbling Blocks
- Data Collection
- Flow Diagram
- Integrity Constraints
- Future Extensions
- Acknowledgements
- References and Resources used




# DESCRIPTION

Too many choices of movies often make people confused. To help people to relief this pain, we present a movie recommendation system that helps to recommend movies for users based on collaborative filtering approach with KNN and KMeans clustering methods. With the help of algorithm, users can discovery what might they like.



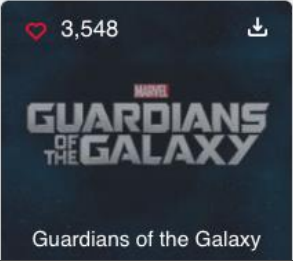
# SNAPSHOTS

HOMEPAGE



**PUBLISHED** DEC 6, 2018    **UPDATED** DEC 6, 2018    **RATING** ★★★★★    2,548    215    546

FEATURD MOVIES

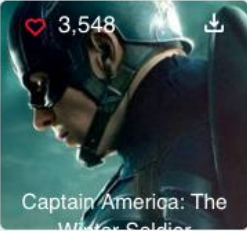


Guardians of the Galaxy


2,548    215    546

Rating : ★★★★★

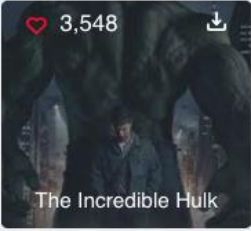
Release Date Mar 15, 2015



Captain America: The Winter Soldier



The Amazing Spider-Man 2



The Incredible Hulk

Input your UserID and MovieID:

UseriD:

MovieiD:

# SNAPSHOTS

Input  
UserID:87  
MovieID: 637

FEATURD MOVIES

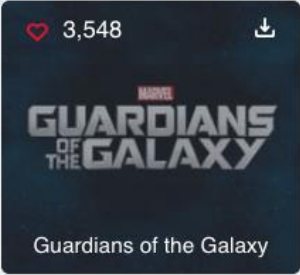
Input your UserID and MovieID:  
Q

UserID:  
87

MovieID:  
637

3,548

↓



Guardians of the Galaxy

2,548

215

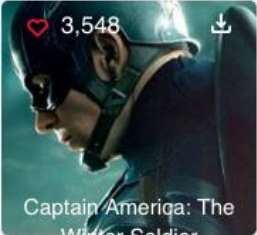
546

Rating : ★★★★★☆

Release Date Mar 15, 2015

3,548


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Captain America: The Winter Soldier

3,548

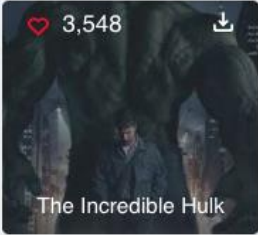
↓



The Amazing Spider-Man

3,548

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The Incredible Hulk

2,548

215

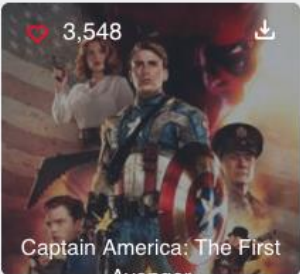
546

Rating : ★★★★★☆


Release : Mar 15, 2015

3,548


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Captain America: The First Avenger



Iron Man




Detective Byomkesh Bakshy |...  
TRAILER#2

2,548


215

546

Rating : ★★★★★☆



THE AMAZING SPIDER-MAN



X-Men

page 6

# SNAPSHOTS

Result of  
UserID:87  
MovieID:637

UserID:87

The Movie that you like:637

Movie 637: Return of Martin Guerre, The (Retour de Martin Guerre, Le) (1982)



Your avg score for this class is 3.5

You might also like:

Film id: 6| Film Title: Shanghai Triad (Yao a yao yao dao waipo qiao) (1995)

Film id: 7| Film Title: Twelve Monkeys (1995)

Film id: 9| Film Title: Dead Man Walking (1995)

Film id: 15| Film Title: Mr. Holland's Opus (1995)

Film id: 18| Film Title: White Balloon, The (1995)

Film id: 19| Film Title: Antonia's Line (1995)

Film id: 30| Film Title: Belle de jour (1967)

Film id: 37| Film Title: Nadja (1994)

Film id: 46| Film Title: Exotica (1994)

Film id: 52| Film Title: Madness of King George, The (1994)



# SNAPSHOTS

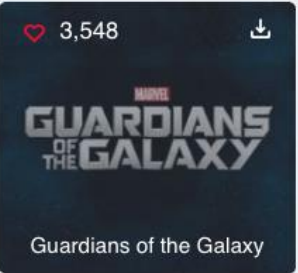
Input  
UserID:100  
MovieID: 1000

FEATURD MOVIES

Input your UserID and MovieID:  
UserID:  
100  
MovieID:  
1000

3,548

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Guardians of the Galaxy

2,548

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215

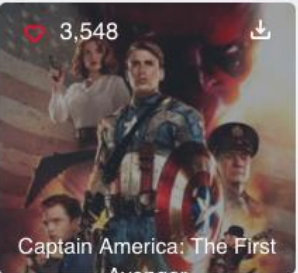
546

Rating : ★★★★★☆


Release Date Mar 15, 2015

3,548

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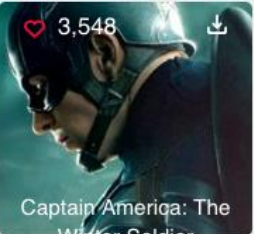


Captain America: The First Avenger



3,548


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Captain America: The Winter Soldier

3,548

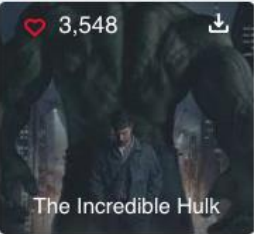
↓



The Amazing Spider-Man

3,548

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The Incredible Hulk

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215

546

Rating : ★★★★★☆

Release : Mar 15, 2015



Detective Byomkesh Bakshy |...  
TRAILER #2


2,548

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215

546

Rating : ★★★★★☆



THE AMAZING SPIDER-MAN



page 8



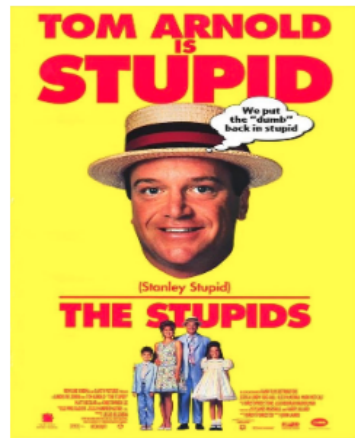
# SNAPSHOTS

Result of  
UserID:100  
MovieID:1000

UserID:100

The Movie that you like:1000

Movie 1000: The Stupids (1996)



Your avg score for this class is 2.1538461538461537

You might also like:

Film id: 13| Film Title: Mighty Aphrodite (1995)

Film id: 25| Film Title: Birdcage, The (1996)

Film id: 26| Film Title: Brothers McMullen, The (1995)

Film id: 40| Film Title: To Wong Foo, Thanks for Everything! Julie Newmar (1995)

Film id: 41| Film Title: Billy Madison (1995)

Film id: 42| Film Title: Clerks (1994)

Film id: 63| Film Title: Santa Clause, The (1994)

Film id: 67| Film Title: Ace Ventura: Pet Detective (1994)

Film id: 72| Film Title: Mask, The (1994)

Film id: 73| Film Title: Maverick (1994)

# SNAPSHOTS

Input  
UserID:666  
MovieID: 666

FEATURD MOVIES

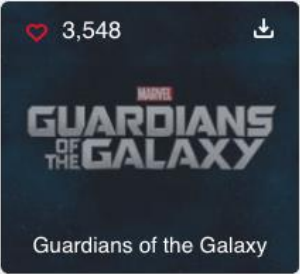
Input your UserID and MovieID:  
🔍

UserID:  
666

MovieID:  
666

📖 3,548

📌



Guardians of the Galaxy

📖 2,548

📌 215

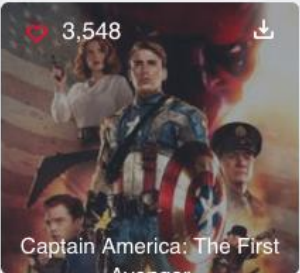
📌 546

Rating : ★★★★★☆


Release Date Mar 15, 2015

📖 3,548

📌

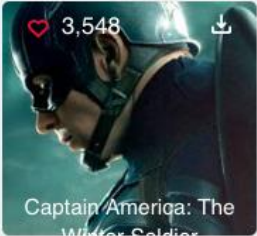


Captain America: The First Avenger



📖 3,548


📌



Captain America: The Winter Soldier

📖 3,548

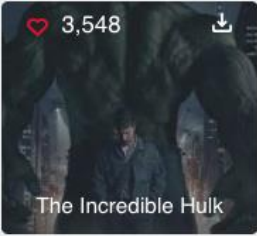
📌



The Amazing Spider-Man

📖 3,548

📌



The Incredible Hulk


📖 2,548

📌 215

📌 546

Rating : ★★★★★☆

Release : Mar 15, 2015




📖 2,548


📌 215

📌 546

Rating : ★★★★★☆



THE AMAZING SPIDER-MAN



page 10

# SNAPSHOTS

Result of  
UserID:666  
MovieID:666

UserID:666

The Movie that you like:666

Movie 666: Audrey Rose (1977)



Your avg score for this class is 3.2471364547440293

You might also like:

Film id: 84| Film Title: Robert A. Heinlein's The Puppet Masters (1994)

Film id: 123| Film Title: Frighteners, The (1996)

Film id: 185| Film Title: Psycho (1960)

Film id: 200| Film Title: Shining, The (1980)

Film id: 208| Film Title: Young Frankenstein (1974)

Film id: 217| Film Title: Bram Stoker's Dracula (1992)

Film id: 219| Film Title: Nightmare on Elm Street, A (1984)

Film id: 234| Film Title: Jaws (1975)

Film id: 288| Film Title: Scream (1996)

Film id: 343| Film Title: Alien: Resurrection (1997)

# SNAPSHOTS

Input(Invlid)  
UserID:10000  
MovieID: 23

FEATURD MOVIES

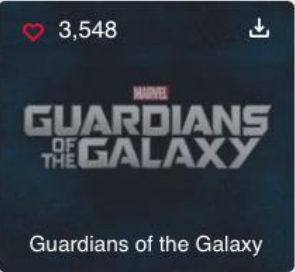
Input your UserID and MovieID:  
Q

UserID:  
10000

MovieID:  
23

3,548

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Guardians of the Galaxy

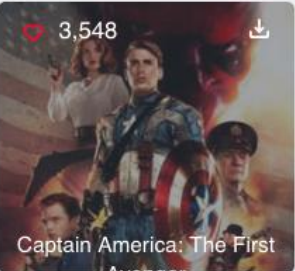
2,548

215

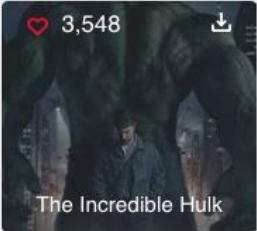
546

Rating : ★★★★★☆

Release Date Mar 15, : 2015



Captain America: The First Avenger



The Incredible Hulk


2,548

215

546

Rating : ★★★★★☆

Release : Mar 15, 2015




Detective Byomkesh Bakshy |...  
TRAILER #2

2,548

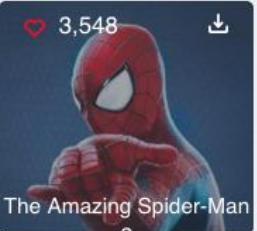
215

546

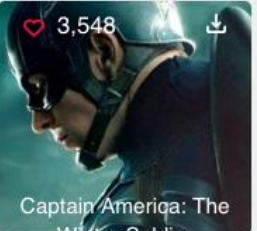
Rating : ★★★★★☆



THE AMAZING SPIDER-MAN



The Amazing Spider-Man



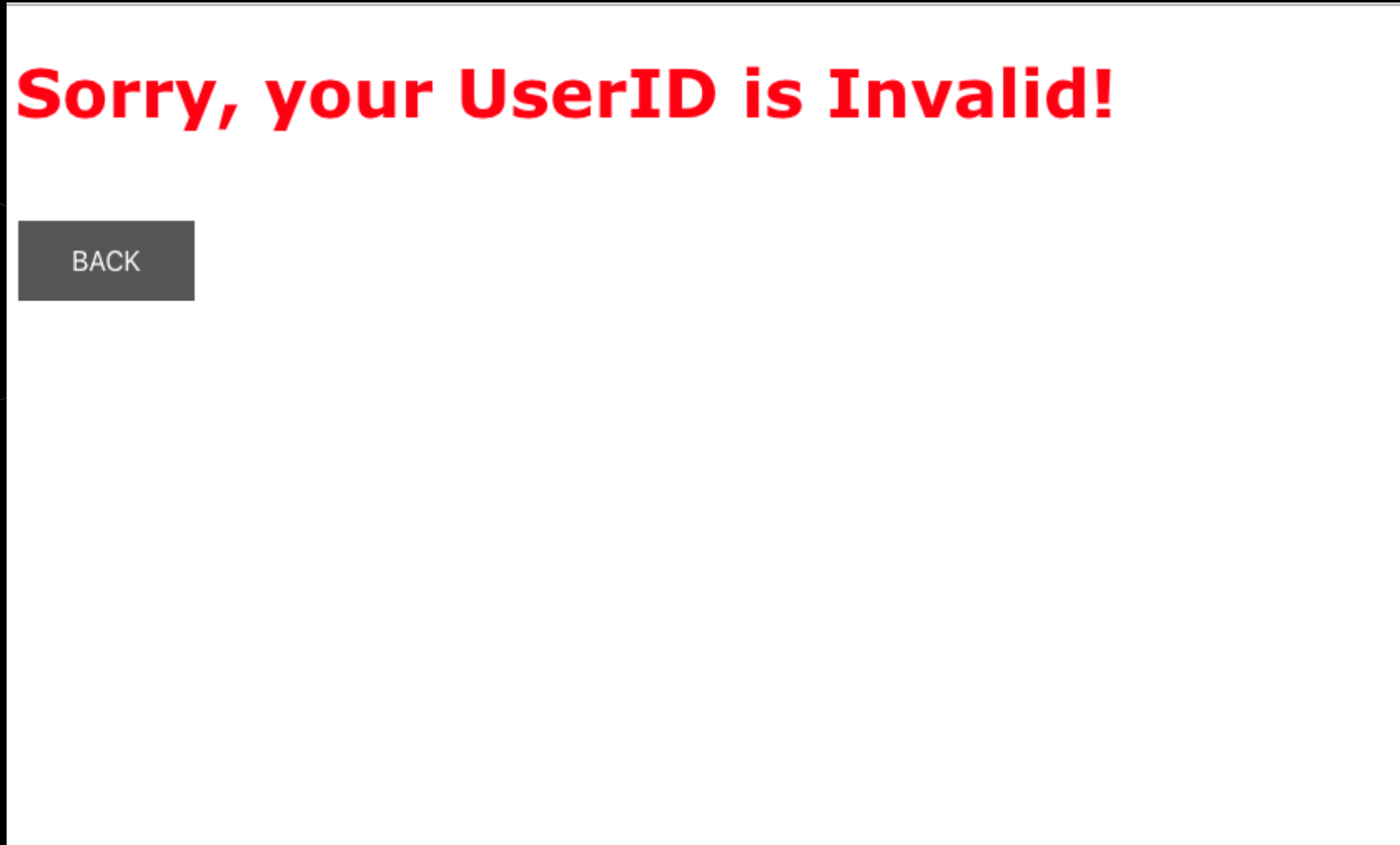
Captain America: The Winter Soldier

page 12



# SNAPSHOTS

Result of  
UserID:10000  
MovieID:23



# SNAPSHOTS

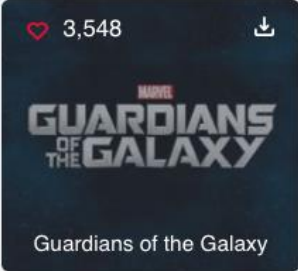
Input(Invalid)  
UserID:24  
MovieID: 10000

### FEATURD MOVIES

Input your UserID and MovieID:

UserID:  
24

MovieID:  
10000



3,548

Guardians of the Galaxy

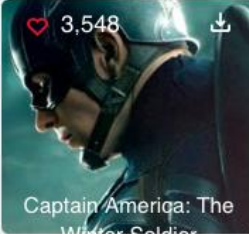
2,548

215

546


Rating : ★★★★★☆

Release Date Mar 15, 2015



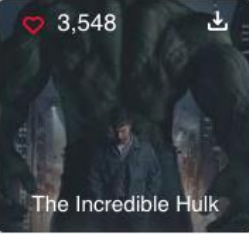
3,548

Captain America: The Winter Soldier



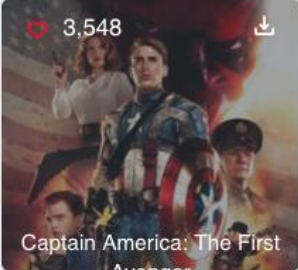
3,548

The Amazing Spider-Man




3,548

The Incredible Hulk



3,548

Captain America: The First Avenger



Detective Byomkesh Bakshy |...  
TRAILER #2


2,548

215

546

Rating : ★★★★★☆

Release : Mar 15, 2015




2,548

215

546

Rating : ★★★★★☆



page 14

# SNAPSHOTS

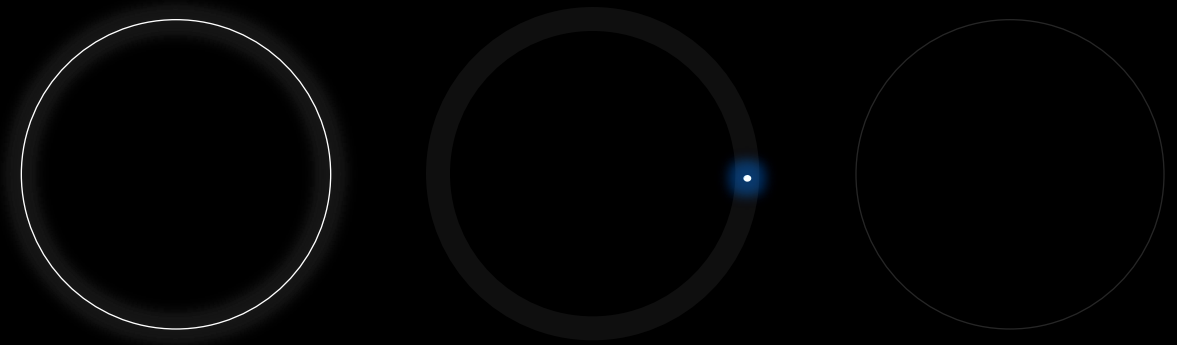
Result of  
UserID:24  
MovieID:10000

**Sorry, your MovieID is Invalid!**

BACK

# PROJECT STUMBLING BLOCKS

Because of the sparse feature of the massive data and cold-start problem of some new user, the recommended results can be inaccurate sometime.

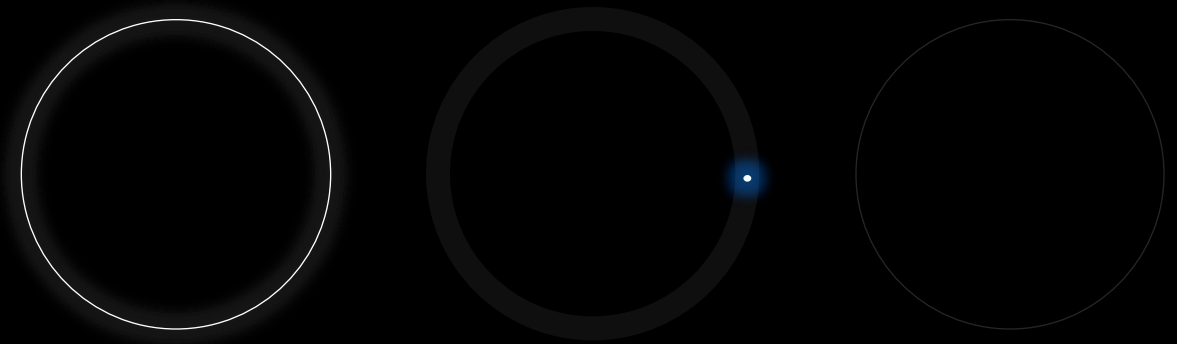




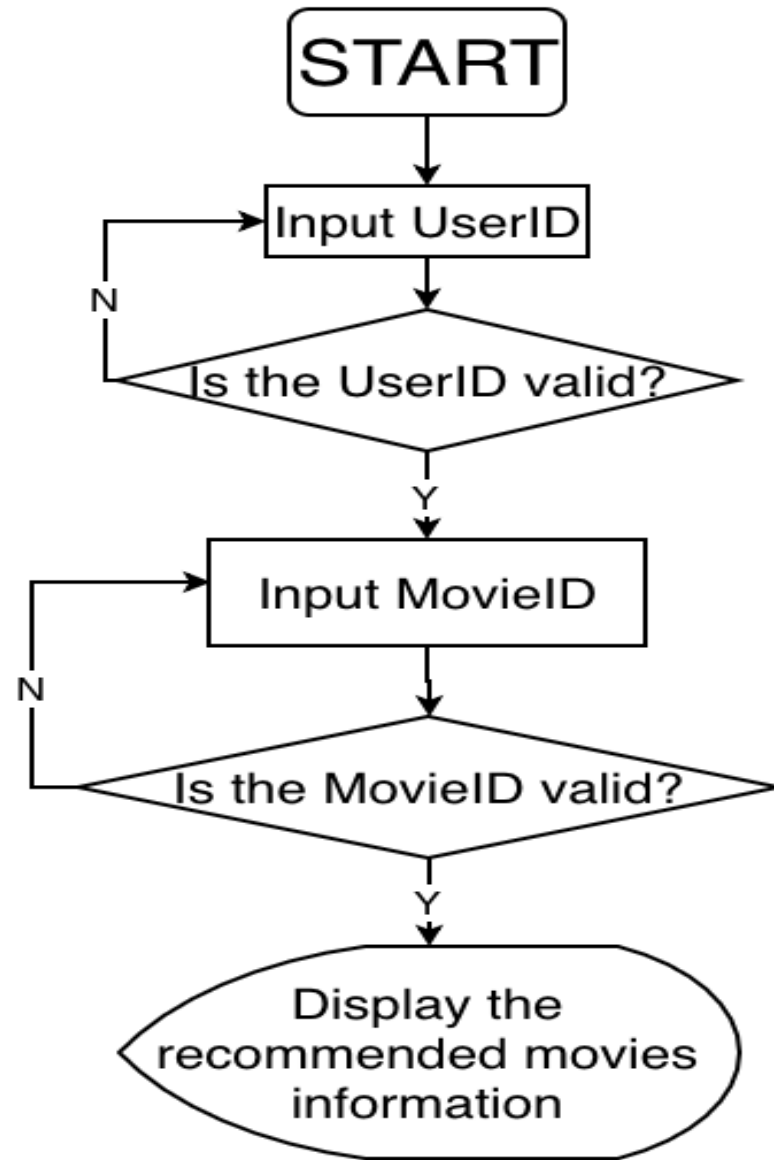
# DATA COLLECTION

GroupLens Research has collected and made available rating data sets from the MovieLens web site (<http://movielens.org>). The data sets were collected over various periods of time, depending on the size of the set.

In this project we used the Stable benchmark dataset, which included 1 million ratings from 6000 users on 4000 movies. Released 2/2003.

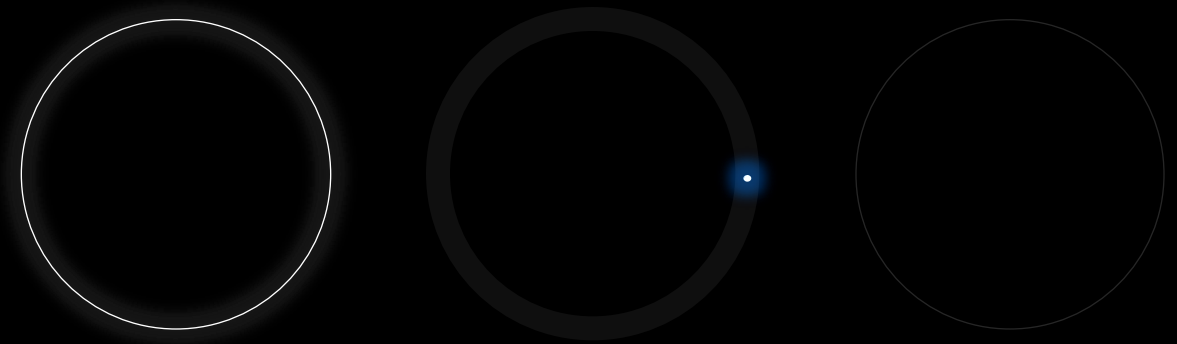


# FLOW DIAGRAM



# INTEGRITY CONSTRAINTS

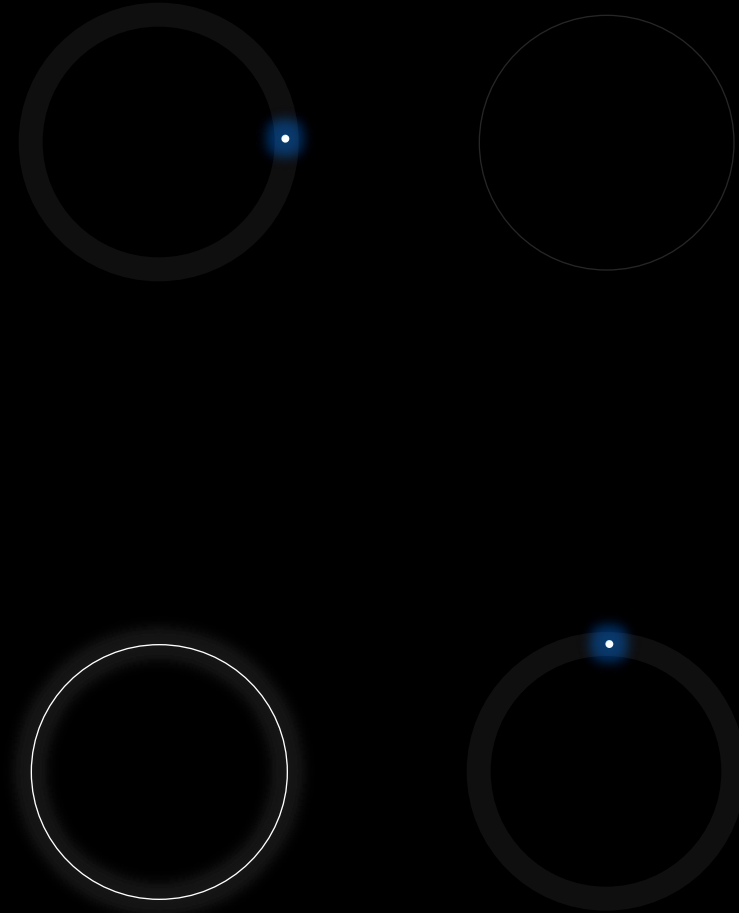
- Input Integrity Constraint:  
Title(string)
- Output Integrity Constraint 1:  
MovieID (integer, range between  
0 and 3952)
- Output Integrity Constraint 2:  
Title(string)
- Output Integrity Constraint 3:  
Ratings(integer, range between  
0 and 5)



# EXTENTION FEATURES

Our model is entirely based on off-the-shelf data, i.e. MovieLens data. If we can modify our model to support online machine training, that would be much more powerful and suitable for real-life applications.

Still, there's much room for improvement for our Web UI. For example, it's possible to add drop down menu to select movies, adding more convenience.

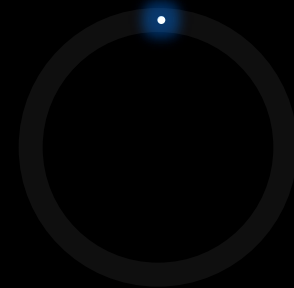
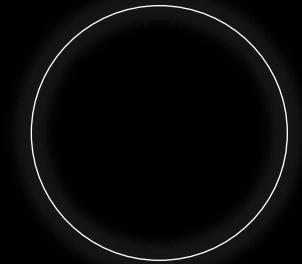
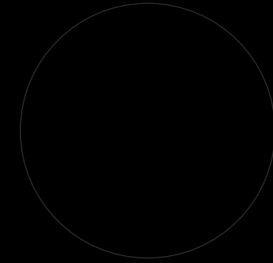
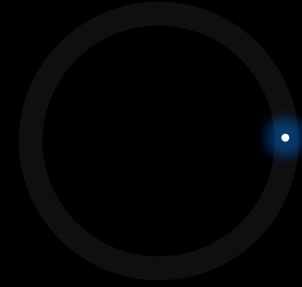




# ACKNOWLEDGEMENTS

Thanks for the hard work of GroupLens Research, without whose datasets we cannot finish our project.

And also thanks for our TA, Harsha's advice on how to do our project.



# REFERENCES

- **Dataset:**  
<https://grouplens.org/datasets/movielens/1m/>
- **Collaborative Filtering:**  
[https://en.wikipedia.org/wiki/Collaborative\\_filtering](https://en.wikipedia.org/wiki/Collaborative_filtering)
- **sklearn.cluster.Kmeans:**  
<https://scikitlearn.org/stable/modules/generated/sklearn.cluster.KMeans.html#sklearn.cluster.KMeans>
- **NumPy:** <https://docs.scipy.org/doc/numpy-1.13.0/reference/>

