Computer Science NEA: Movie Searching, Planning, And recommendation program

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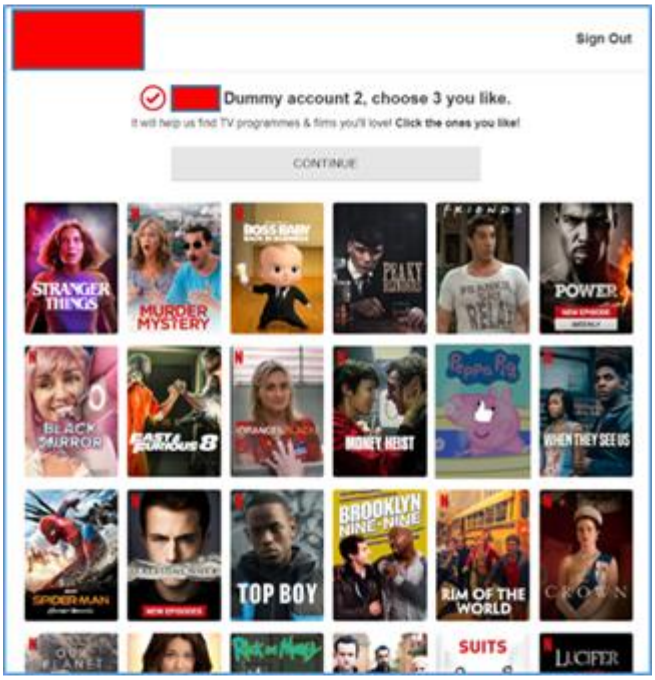
Research

Introduction

This projects main aim is to create a web-based Movie and TV show search engine, recommendation program and rating system for people who use video streaming websites, so the users will be able to accurately find movies that they like or want to watch. This web application will be aimed at many users, however, it will have a main end-user who will review the end result. This person shall be referred to as BDev during this investigation. BDev was chosen as they are a Standards Vice President of the society of motion picture and television engineers, as well as CEO of MR MXF Ltd, a consultancy specializing in file-based workflows for Billion dollar Media corporations such as BBC and Netflix. BDev will be able to give an expert insight during investigation and testing due to their media and computational experience. There will be other users referred to in this investigation where applicable, as computational learning will be a part of the programming, it will be important to have more than one user for testing.

Currently, the example Netflix has its own search engine for films and TV shows, However many users end up endlessly browsing the site to find something to watch. Furthermore, the scope is relatively low with that only the title main actors (usually two to three), the content tags and directors. Some examples of some content tags that Netflix Uses are Comedies, British Programmes, action and adventure programs, series and action, and adventure from the first five. Some of these seem to be combinations of tags such as TV program (or series) and action and adventure for example, and all 'recommended' or 'trending now' tags have been ignored as this will not be an aspect of this program. Search results may also include related media but will fail to mention if that specific movie or TV show is 'unavailable' on that site, which is annoying to users. Moreover, Netflix has a Thumbs up Thumbs down rating system, wherein which the results are not displayed, this too is an issue with many users. One notable thing Netflix does is that in new accounts it asks you to pick three movies or more to personalize your account to you.



[redacted]

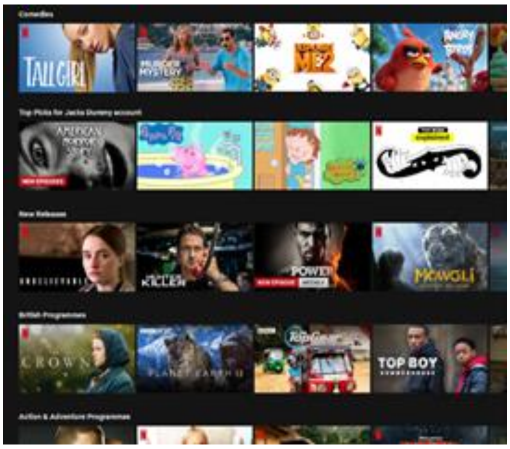
Sign Out

[redacted] Dummy account 2, choose 3 you like.

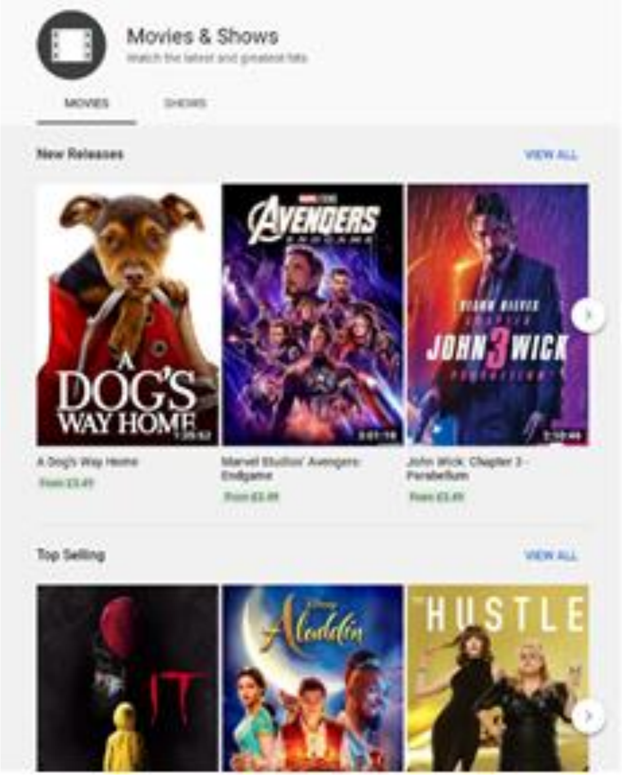
It will help us find TV programmes & films you'll love! Click the ones you like!

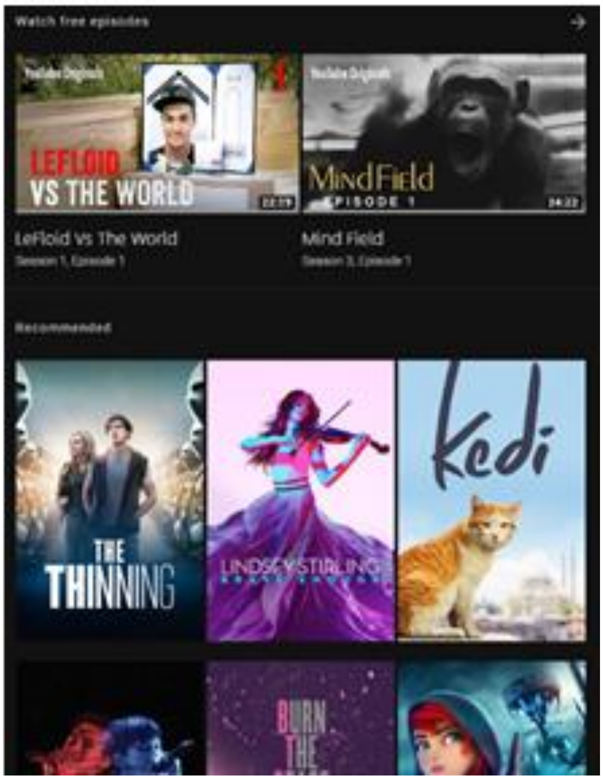
CONTINUE

This could be useful to recommend movies on the webpage before the user starts searching movies and TV shows so the page does not appear as blank before any data.



Netflix has been chosen as an example as it is both accessible and has had complaints about its service in movie searching and rating, both online and by my peers. Therefore another example to examine is YouTube. YouTube is a free video-sharing website, which gives free access to videos from cooking and makeup tutorials to gaming playthroughs and reviews. YouTube also has a movie streaming aspect on its website in the form of its Movies & Shows Channel, Where individual movies can be bought or rented, and YouTube Originals, which is for premium monthly subscriptions only. The search engine is title based, as it is not made directly for movie watching as the user just has to use the regular youtube search bar, moreover, youtube does not recommend movies at all unless you hunt them out or go to the specific web page. The YouTube originals page also lacks a rating system and a learning/recommendation algorithm.





Questionnaire

This Questionnaire asks Four different Streaming website users; **PM, MR, LJ, DM,** and the main end-user **BDev.** The user's responses have been color-coded to each question.

Question 1: **What streaming website(s) do you use? And for roughly how long?**

YouTube for 11 years, Vimeo for 10 years, and sometimes Dailymotion for 10 years.

Netflix for 7 years, YouTube occasionally over the similar time span and also use BBC IPlayer.

Amazon, Netflix.

Now and Netflix, 6 months and 5 years for Netflix.

Question 2: **Which is your favourite and why?**

YouTube is my favourite for marketing because most people will click on the links. Vimeo is my favourite for quality indie content.

I like the IPlayer the best but probably use Netflix the most as it has more content.

Netflix, better choice of what we like to watch.

Go to is Netflix out of habit. Now for Game of Thrones and Downton Abbey. No favourites, just for what is available on them.

Question 3: **What is Your Opinion on them, do you like them?**

YouTube is good, but their take-down policies seem to be poorly implemented because of the scale of the operation (hate speech, fake news, etc.). Vimeo is really good for people wanting to showcase their content and the quality is often better than YouTube. Dailymotion is good for a non-USA source of content (it's a French site and subject to French law). It has a special place for me because one of my companies shared an owner with Dailymotion and at one stage we were going to merge.

I like BBC iPlayer because you can search by category or channel, Netflix I find a bit tedious to search as you need to scroll through all the films and then click on the film to get the film BIO.

Easy to access and there is little to watch on terrestrial TV.

No real opinion, they are just tools, Netflix is maybe easier to navigate. Do I like them? I guess so, because they provide a good service.

Question 4: **has your opinion on them changed over time? If so why?**

They have each maintained their market position and survived newcomers like Vine who arrived and then vanished. There is a question on whether they will all survive when really big services from China (Youku Tudu & TikTok) and India start to get more traction with the local markets. They all struggle to survive because adverts can drive away viewers but without adverts, they go bust. New entrants to the market grow quickly because they gain market share without showing adverts but eventually have to behave like everyone else. If the service is free then the consumer is the product.

No not really in terms of user ability but the content on Netflix has improved over the years.

No.

No.

Question 5: **Do you ever find it hard to find a movie or TV show on the website(s)?**

If a movie is available, I can always find it. Some movies are not available in certain territories at certain times. It is often possible to find a movie by using a VPN in a different country when doing the search. For example, if Sky has bought a movie for their UK service, then it won't be on Netflix in the UK, you might be able to find it on Netflix by using a USA VPN

Yes – see above for Netflix, if you want to search for an actors name or director it is a very slow process.

Not often.

Yes sometimes there is little to inspire, but generally there is something I fancy.

Question 6: **Do you think the rating system is adequate? If not why?**

No, it is not adequate, I have seen great films with a low rating and vice versa. It is too general

Yes.

The ratings are subjective but offer a guide, but I generally decide by cast and director.

Question 7: **Are there any improvements you would like to see on the streaming websites?**

Better personalized search ACROSS websites would be nice e.g. searching and aggregator that tells me if a certain video is on YouTube or Vimeo or Netflix or some other site. The problem is that they would store my personal information to do the service and then they would sell it to someone else.

Technically the streaming services are very good. Ethically - not so much.

Easier search facilities by Director or actor.

Some of the search functions don't seem 100% logical.

None I can think of.

Question 8: **Have you ever stopped using a streaming website /cancelled the subscription, If so, why?**

I cancelled my Google Play subscription because I wasn't using it and already had YouTube, Vimeo, Dailymotion, Netflix, Amazon Prime, and ITV Hub.

Yes – I have cancelled Netflix. Despite being a long term customer mu user logins have been reduced from 3 to 2 and the price has increased from £7 to £9. These as percentage are huge reductions in service 33.3% and 20% increase in price.

Not yet.

No, may cancel Now, but only to save money.

Question 9: **How interested would you be in an improved search and recommendation system for video streaming, based on your feedback?**

I am at the IBC show and there are about 50 companies offering me improved personalized search. All of them are technically good but the business model does not work unless they sell my data and identity to someone else. I am interested in better search, but not if I am spied on and every click is logged and broadcast to the world.

Yes, perhaps one that also spans across several services.

Yes, I would be interested. 6/10.

What is there is adequate, Now could be improved.

Question 10: **Would it affect your preferred streaming website if such a website existed?**

If the perfect search/recommendation engine were available, I would end up having a narrower range of viewing habits and the Facebook effect of only seeing things that I agree with would take place. The original TV broadcaster's idea to "surprise and delight" the audience is less likely to happen if the content that is recommended always reflect the current views of the person. The perfect engine should occasionally challenge my viewing with things that I did not expect to like

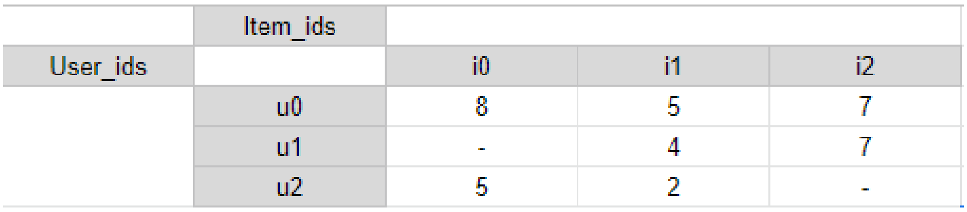
Maybe.

Possibly.

No, what affects my choice is content.

Algorithm research

One of the most important parts of my program would be the recommendation algorithm that will recommend movies to the user based on what types of movies they have already liked. This should work roughly by strengthening or weakening the values for each value in each category after each movie is watched or rated.

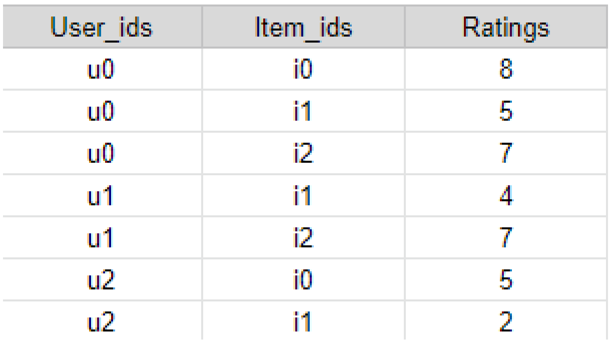


	Item_ids			
User_ids		i0	i1	i2
	u0	8	5	7
	u1	-	4	7
	u2	5	2	-

A good way to do this can be shown by an article by Medium (https://towardsdatascience.com/make-your-own-recommendation-system-b596d847296d)

This matrix gives multiple users and items, each with a corresponding rating value that the user has given. It is annoying that like my program, there will be lots of blank areas as not all users will rate all movies, moreover, there will be a significantly small amount of users due to constraints on the program itself, and the amount of people I can get to test it.

A better thing to do then would be to put them in a table in a database, like so.



User_ids	Item_ids	Ratings
u0	i0	8
u0	i1	5
u0	i2	7
u1	i1	4
u1	i2	7
u2	i0	5
u2	i1	2

(The key field will be compound of the User_ids and the Item_ids, so each user can rate multiple movies)

For the recommendation algorithm, I may need to create a 1 layer neural network, or just some sort of simple between zero and one value relationship between a single user and all their movies that they have watched or rated.

Ratings

At this time ratings will most likely be a user simply rating a movie out of 10 and then storing the result. Watching and rating will both contribute to recommended movies, but a bad rating on a watched video will overrule the watched value for a less recommending value. Preferences will mostly be quantified by the movie genre, like action or horror for example. That will be the starting point but branching off for other values like directors or even actors.

Analysis

The main problem that users of streaming websites are facing is finding movies easily using the search system, and searching for more accurate criteria with the search system on these websites and/or apps. The current system(s) involve searching for a Title, actor, director or genre of movie/series and getting incomplete results, or getting results that are seemingly unrelated to the search criteria. This is almost always done through a search bar at the top of the page, however there is no obvious way to search for more than one criteria at once, for example searching 'action Bruce Willis' will not work very well as it will search the whole term, not each separately. Most of the streaming services require you to log in at some point in order for the data to be stored about you after closing the application. As storing this data in cookies would be much more difficult for me to program, I will store it in a file after the user has logged in when entering the site. This way data can be stored and the web app tested at any time as long as it is running.

Prospective users

The will have to be a few users, some of which I have named already, that will be using and/or testing the program as due to the fact that it needs to collect data on individual people about their viewing habits, I will need to test that it works with multiple people with different movie interests. A few users may be interested in my program after it is complete, and therefore may use it to search for movies when they do not have a clue what to watch. I hope to make a program that is somewhat useful after it is complete to the various users it will have.

The main limitation of my program is that it will not be able to stream any movies, nor will it be able to have many users at once. If I am using Visual Basic on a home computer as the server for my web app, it most likely will not be able to handle more than a couple users at a time. The usefulness of my program is more just to show how streaming services could do a little better, and if aspects of it were actually applied to them there may be some improvement in the quality of the service that they provide to their users.

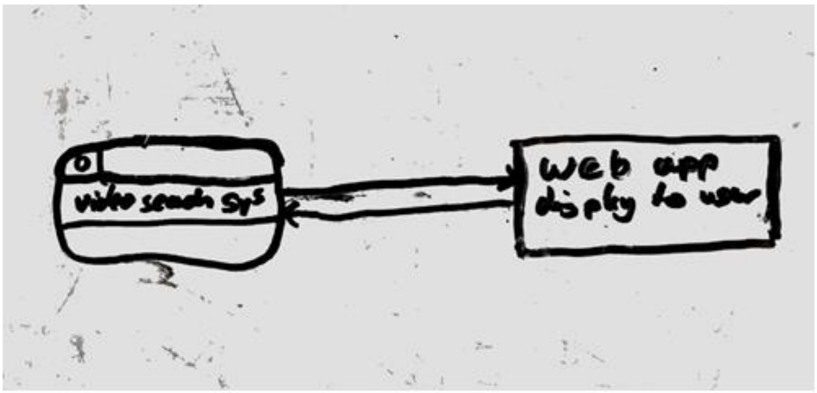
Data Sources and destinations

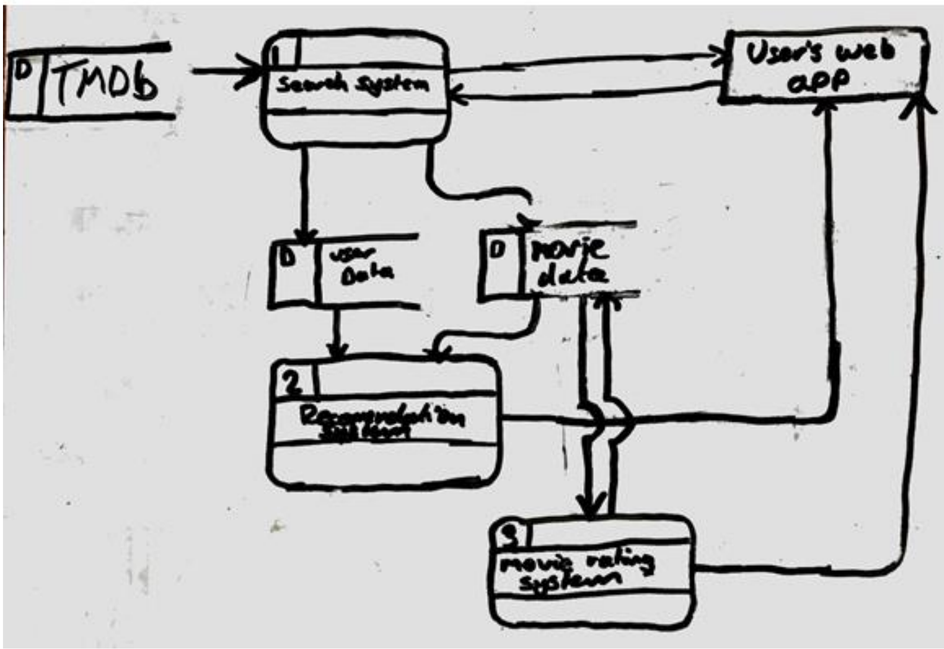
In current systems all the data is internal, so for something like Netflix, which has a limited scope of movies to search from as well as a limited amount of data per movie, its results were incomplete and not as useful as it could be for a user

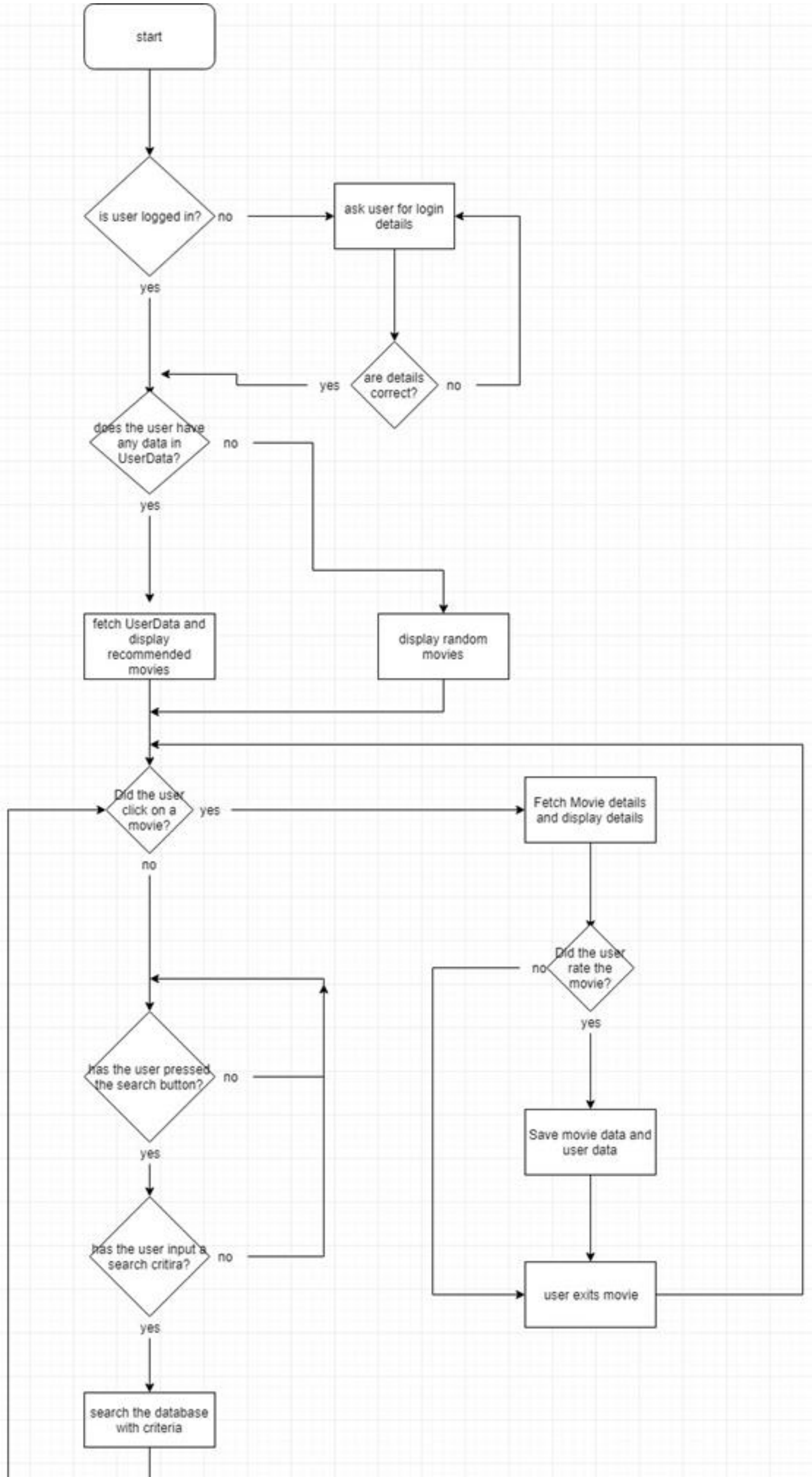
My data will be coming from four main sources

1. The Movie Database, which is an online database of movies and relevant information about said movies, this is where I will get my raw data from.
2. The User(s), the user will be inputting various data such as requests for searches, as well as at the same time providing data on what they like and what they don't
3. The user information, this will be an internal data store of all the users past information that has already been recorded, this can be used for better searches and recommendations to the user while they are using the site
4. Movie data, Where the ratings for each movie are stored that are recorded on the site

The data would be fetched and processed before sending it on its path, the main destination for the data would be the website application, however processed data would also need to be routinely stored in the two internal databases: UserData and MovieData. The following is two data flow diagrams for the proposed system.


0
video search sys
web app
display to user


D
TMDb
1
Search system
User's web
app
D
user
Data
D
movie
data
2
Recommendation
system
3
movie rating
system


start
is user logged in?
no
yes
ask user for login details
are details correct?
yes
no
does the user have any data in UserData?
no
yes
fetch UserData and display recommended movies
display random movies
Did the user click on a movie?
yes
no
Fetch Movie details and display details
Did the user rate the movie?
no
yes
Save movie data and user data
user exits movie
has the user pressed the search button?
no
yes
has the user input a search critira?
no
yes
search the database with criteria

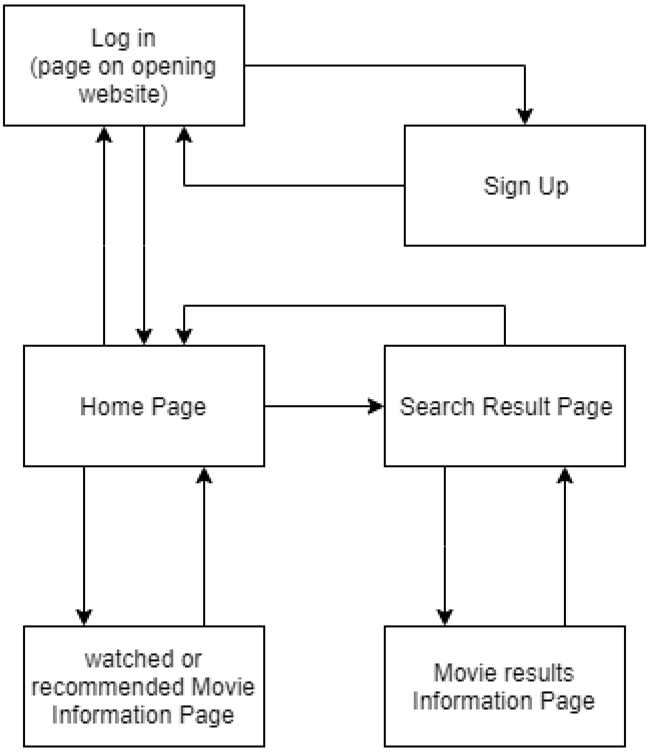
Requirements

1. Hosted on a website/Local host
    a. Starts with a login page
        i. Can have more than one user to log in
        ii. Should have both a password and a username
        iii. User cannot get past login without a correct password with the corresponding username
        iv. Links to a sign up page if user has not signed up
    b. Has a sign in page which lets a user create a username and password
        i. Data will be stored in a UserData database
        ii. Does not let users with the same username as an existing sign up
        iii. Username or password cannot be blank
        iv. Password must be at least 6 characters long
        v. Username must be at least 2 characters long (will advise to use initials or name abbreviation)
        vi. Sends to log in page once signing up
    c. Has a home page that displays recently 'watched' Movies
        i. Home page has a log out button I the corner
        ii. Movies can be clicked, rated and re-watched
        iii. If no watched movies, display a text message "Nothing here yet!"
    d. Display's recommended movies
        i. Recommendations are based on watched movies
        ii. Recommendations will be generated from data in the UserData database
        iii. If no movies watched yet, display random movies
        iv. Movie information will be taken from TMDb
    e. Hosted website/Local host has a search bar at the top
        i. Users can type movie titles, actors, directors, genres and other keywords
        ii. User can press search button to search
        iii. Search bar cannot be blank when searched
    f. The page will change to search results page
        i. search page will display relevant movies to the search criteria
        ii. The user can search again on the search bar on this page
        iii. The user can press a home button to return to the home page
    g. The search page will display relevant movies to the search criteria
        i. Non-user generated movie data will be taken from external database TMDb (such as title, poster/cover art)
    h. Movies can be clicked on
        i. TMDb database is searched for extra movie information (actors, directors, summary)
        ii. MovieData database is searched for movie ratings
        iii. If no ratings display "unrated"
    i. Movies can be rated and 'watched'
        i. 'watching' a movie will add this information to the UserData database
        ii. Rating a movie will add the ratings to the MovieData database

Design

User interface

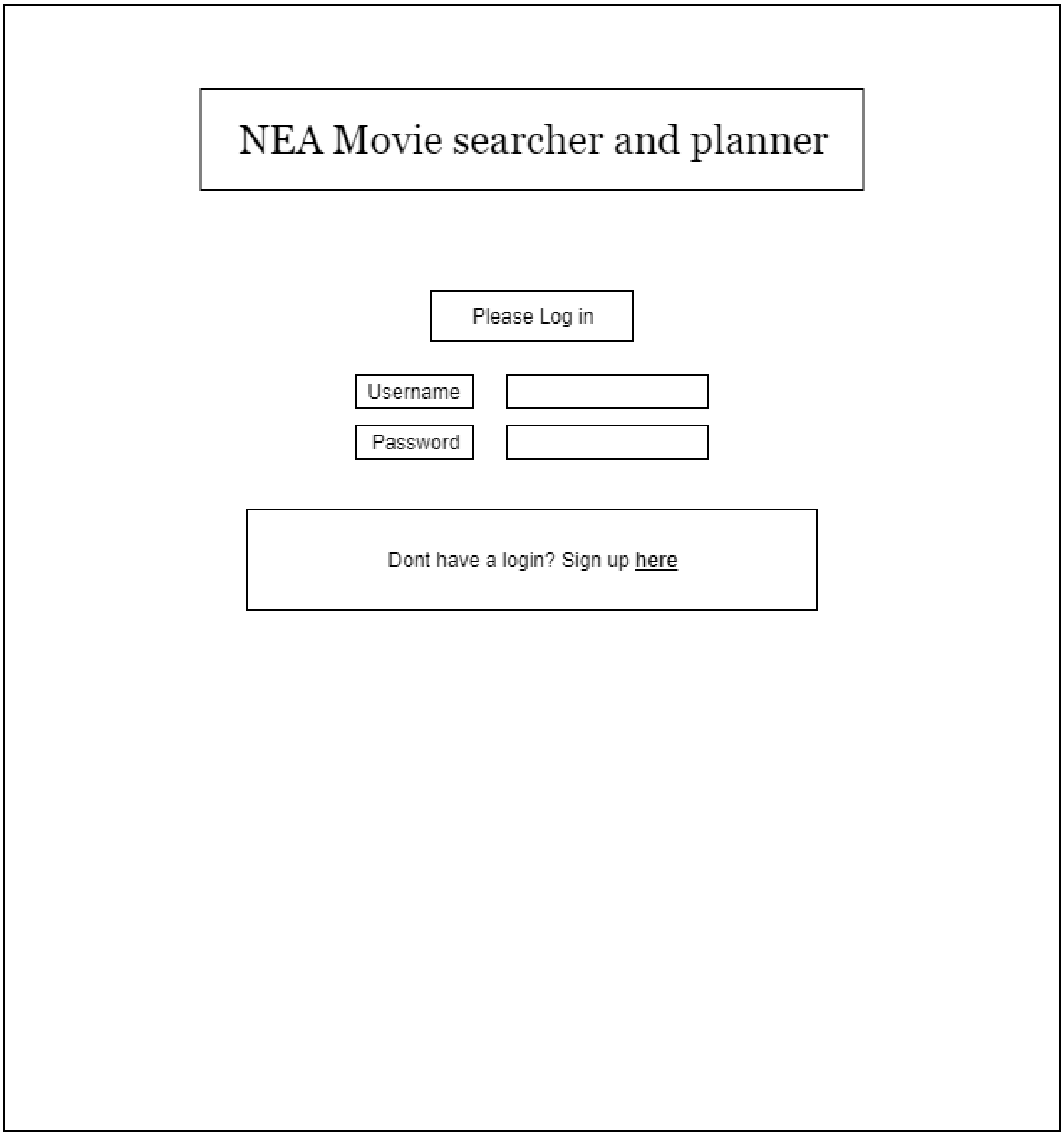
Navigation Diagram


Log in
(page on opening website)
Sign Up
Home Page
Search Result Page
watched or recommended Movie Information Page
Movie results Information Page

GUI Layout

All GUI layouts are subject to small changes in the final stages. This is just a simple guide on what is needed for each page visually, and operationally. Small style or aesthetic differences will occur as they are unimportant at this stage and will be an afterthought if extra time arises for this investigation.

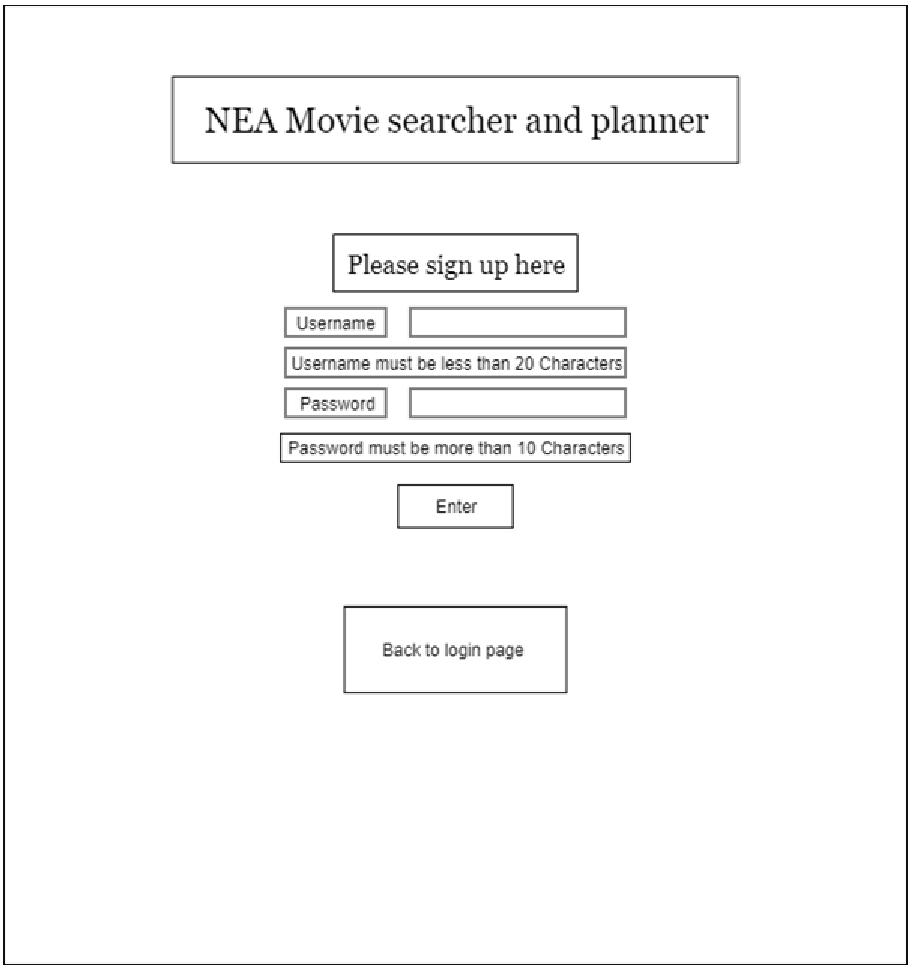
Login page


NEA Movie searcher and planner
Please Log in
Username
Password
Dont have a login? Sign up here

Notes:

- There will be pop up message boxes, like the one that will pop up if a username or password is 1) incorrect or 2) does not exist. These are not shown as they do not create a new page when prompted, they simply display on this page after the criteria is met.
- Arrows represent buttons that will shift the page from one to another, on this page, when a user clicks on the arrow it will do one of three things. 1: it will notice that at least one of the boxes are empty and enter a prompt on the page stating 'Username (or password) must not be left blank.' 2: it will notice that both username and password are entered, it will check it against the UserData database and find that it either the password is incorrect for the username, or the email does not exist and will tell the user as such with a similar prompt. 3: it will do the last step but find that the password and username are correct and continue to the Home page.

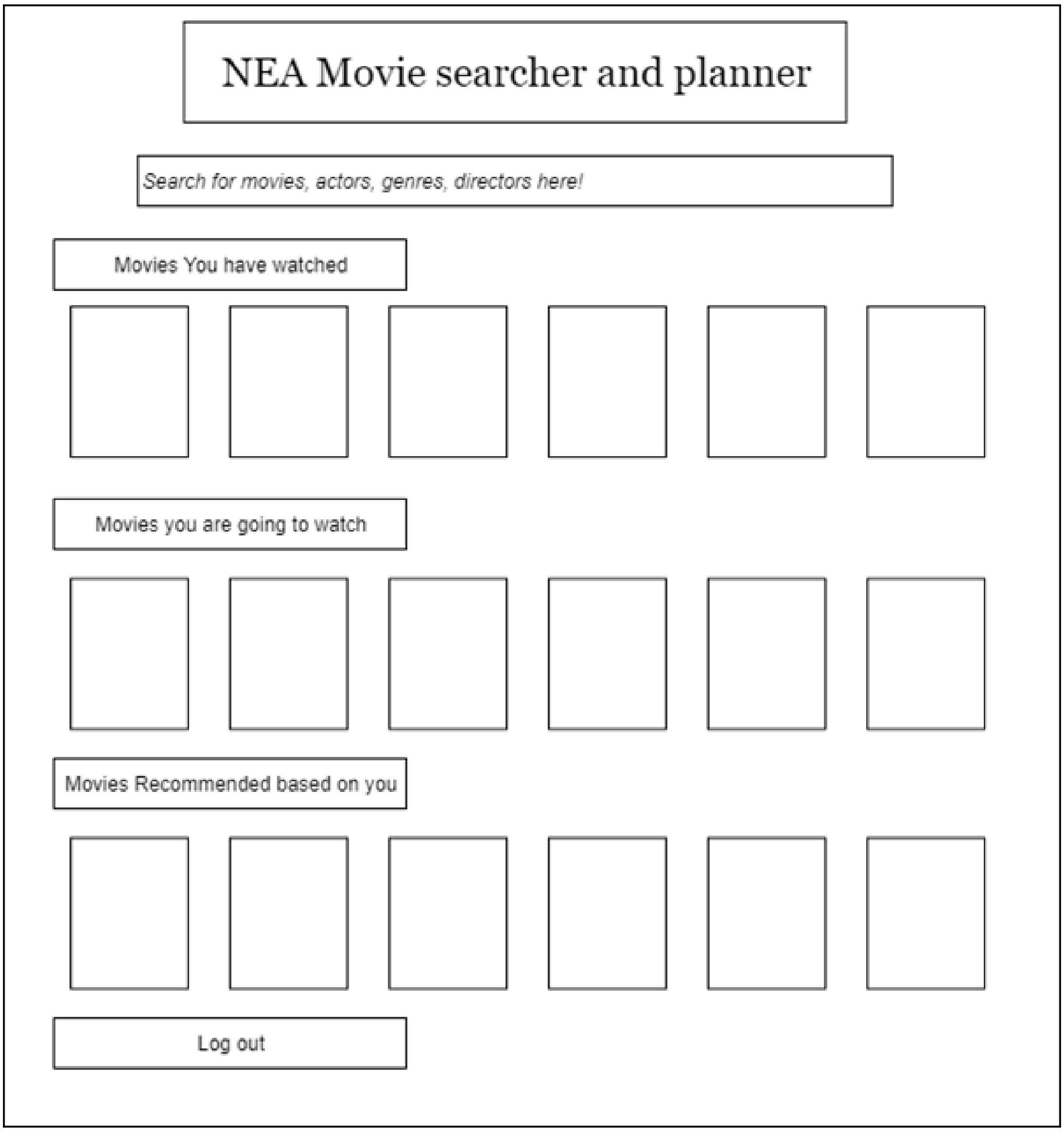
Sign up page


NEA Movie searcher and planner
Please sign up here
Username
Username must be less than 20 Characters
Password
Password must be more than 10 Characters
Enter
Back to login page

Notes:

- The username and password prompts below the text input bar will turn red when criteria are not met, green when criteria are met, and white when there are no characters inputted in the box
- Clicking enter will check the username against the UserData database to check if it has already has been created, if it has then a prompt asking to choose a different username will show up just below the enter button. However if the username is unique then it and the password will be committed to the UserData database before sending the user back to the login page.
- There is no need for password reset at this time as it is so easy to create a new one, furthermore it will add a layer of complexity that is not needed for the program

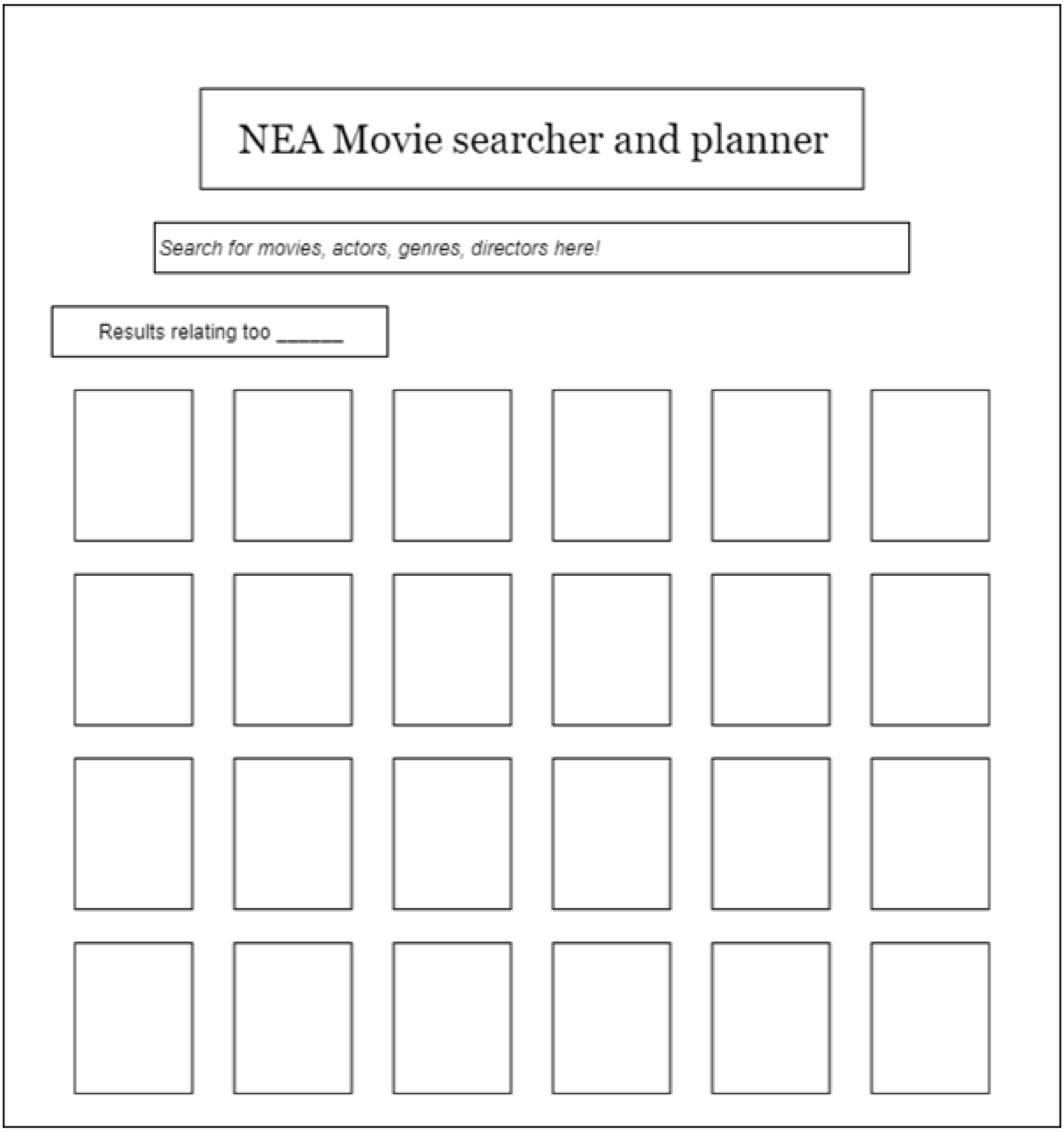
Home page


NEA Movie searcher and planner
Search for movies, actors, genres, directors here!
Movies You have watched
Movies you are going to watch
Movies Recommended based on you
Log out

Notes:

- Square blank boxes represent a space for a movie poster/image, and dimensions are subject to change. Clicking on any of these movie posters will open up the relevant movie page
- A set amount of movies will be displayed in each bar, clicking at the end of the bar will shift the movies across. For example if A user had watched 7 movies, they would click at the right side, or left side, of the 'movies you have watched' bar to shift it in that direction by one, to see the rest of the movies in that bar. Movies will repeat in a loop and will shift back round to the beginning once the end of the list has been reached

Results page

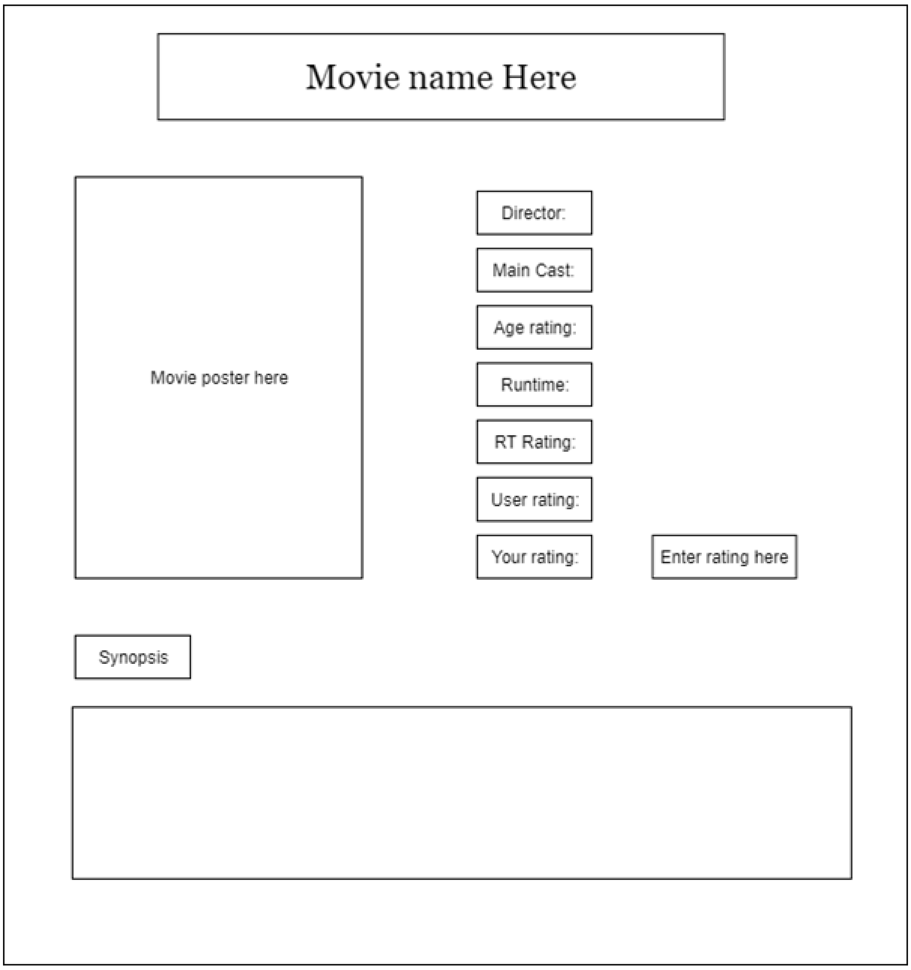


NEA Movie searcher and planner
Search for movies, actors, genres, directors here!
Results relating too ______

Notes:

- While the home page implements a list looping system on each row, the movie results page will simply just scroll down till the end of the list is reached
- Square blank boxes represent a space for a movie poster/image, and dimensions are subject to change. Clicking on any of these movie posters will open up the relevant movie page
- Movies, directors, etc. can be searched again from the same search bar, and will display different results, there will be no need to return to the homepage to search again

Movie information page

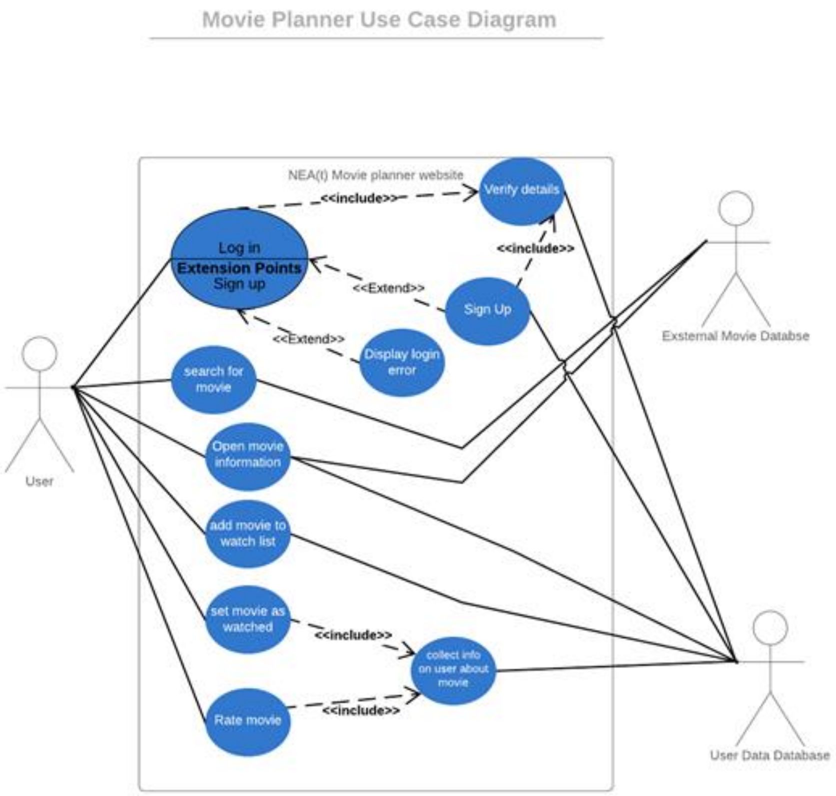


Notes:

- There will be two separate instances of the movie information page, one for the home page movies, and the other for the results movies. They will have a similar layout, if not identical. This is so the pages don't get confused and that when you exit the Movie information page/ or go back, it will take you back to the page you clicked it from, rather than just going back to the home page and loosing you search results if you clicked the movie information from that that page.
- There will be different data on this page depending on what movie was clicked on in the first place, all data will be relevantly filled in in the end application by the program

Process

Use case Diagram



Main Algorithm Psudocode

```
Sub Event_movie_watched(MovieID by ref, userID by ref):
        Watched=true
        append_movie_database(MovieID by ref, userID by ref)
 End sub
Sub Event_movie_rated(MovieID by ref, userID by ref):
        rating=txt_box_value
        append_movie_database(MovieID by ref, userID by ref)
 End sub
Sub new Home_page():
        IF movies_watched = 0 then
                display_rand_movies()
        Else then
                Display_rec_movies()
        end if
 end sub
Sub Display_recommended_movies()
        UID = Get_User_Id()
        SQL_set_user_watched_movies_array(UID)
        SQL_set_user_rated_movie_array(UID)
        for I = 0 to len(MV_array) :
                tempID = MV_array(I)
                tempganrelist = Get_movie_ganre_list(TempID)
                for e = 0 to len(TempGanreList):
                        TempGanreList(e) =
```

SQL statements

Creation statements

```
CREATE TABLE [Movies_Table] (

  [MovieID] varchar(15),

  [Title] varchar(15),

  [Adult] bit,

  [Overveiw] varchar(MAX),

  [Poster_Path] Varchar(50),

  [Runtime] time(7),

  [Vote_Average] Decimal(18,2),

  [User_Rating_Av] Decimal(18,2),

  PRIMARY KEY ([MovieID])

);


CREATE TABLE [WatchedMovies_Table] (
  [MovieID] varchar(15),
  [Username] varchar(20),
  [Watched] Bit
);

CREATE INDEX [FK] ON  [WatchedMovies_Table] ([MovieID], [Username]);

CREATE TABLE [RatedMovies_Table] (
  [MovieID] varchar(15),
  [Username] varchar(20),
  [Rating] int
);

CREATE INDEX [FK] ON  [RatedMovies_Table] ([MovieID], [Username]);

CREATE TABLE [Genres_Table] (
  [GanreID] varchar(7),
  [MovieID] varchar(15),
  [GanreName] varchar(50),
  PRIMARY KEY ([GanreID])
);

CREATE INDEX [FK] ON  [Genres_Table] ([MovieID]);

CREATE TABLE [Users_Table] (
  [Username] varchar(20),
  [Password] varchar(50),
  PRIMARY KEY ([Username])
);
```

Data Definition Language

Examples of the Database DDL I will be calling:

"SELECT * FROM [dbo].[Users_Table] WHERE Username='" & Username_Val & "';"

This SELECT statement will be what selects all the records where the Username equals the one entered by the user, it will then read the first value given for the password field and return it, so it can check if the password entered is in fact correct.

"INSERT INTO [dbo].[Users_Table] (Username, Password) VALUES ('" &Username_Val & "', '" & Password_Val & "');"

The INSERT satatement will insert the correct values for the username and password into the database when the user signs up.

"UPDATE [dbo].[RatedMovies_Table] SET Rating='" & Rating_Val &"' WHERE MovieID='" & MovieId & "' AND Username='" & Username & "';"

Another example would be this UPDATE Statement which will update the databases values for, in this case, the rating of the movie. This is in the case where the movie is hving its rating being changed by the user, rather than creating a new one.

Storage

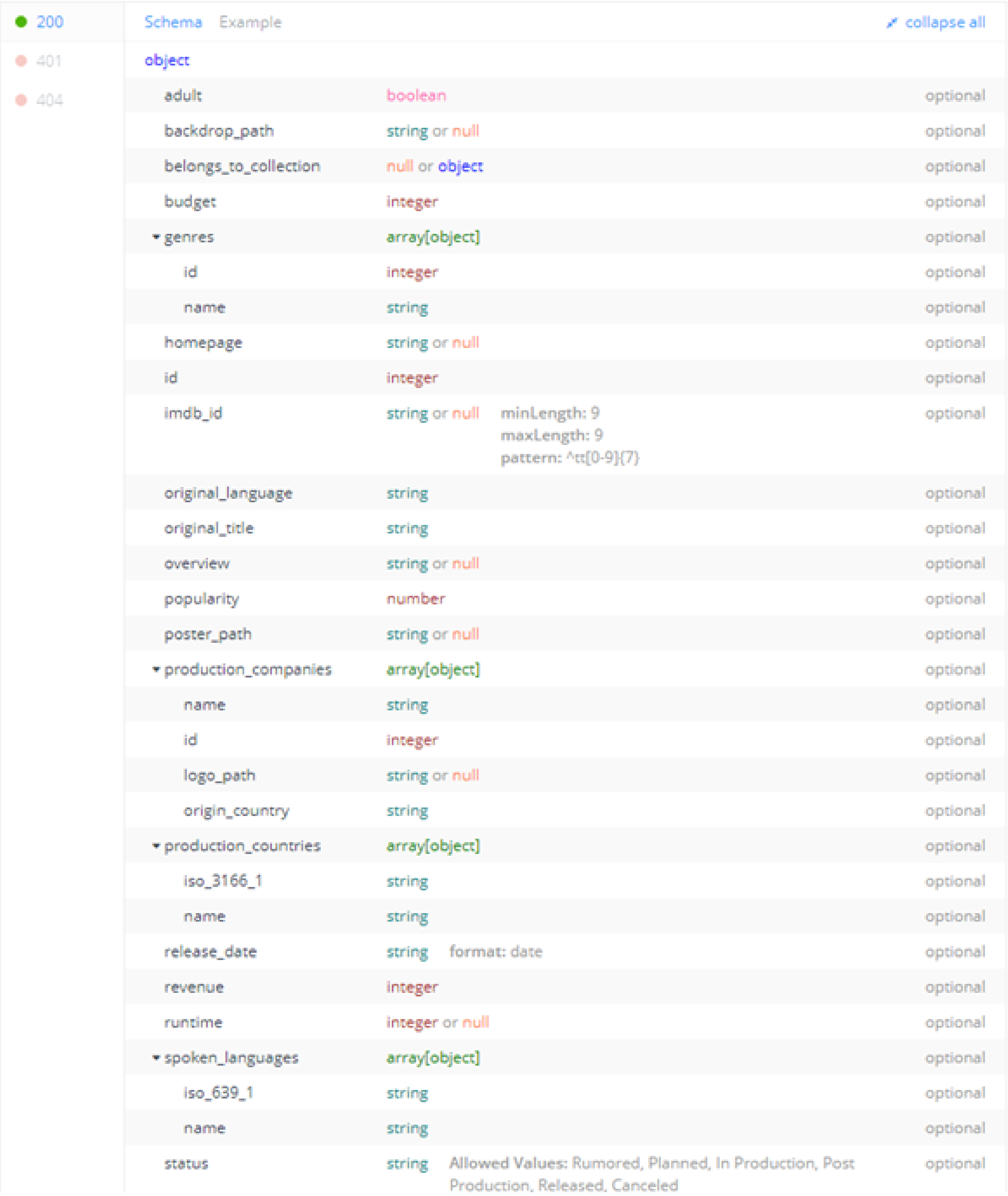
API Details

The API Key I was provided is “c1acc66d602a81899221d1bd24734a36”. An example of an API request might be “https://api.themoviedb.org/3/movie/550?api_key=c1acc66d602a81899221d1bd24734a36” Which will return the Data for the movie Fight Club.

The main search function I am using in my program will be using program will be searching for movie titles as a start, so I will be needing the “GET/search/movie” request, which pass a string and returns the most relevant results. These will then be displayed in on my website.

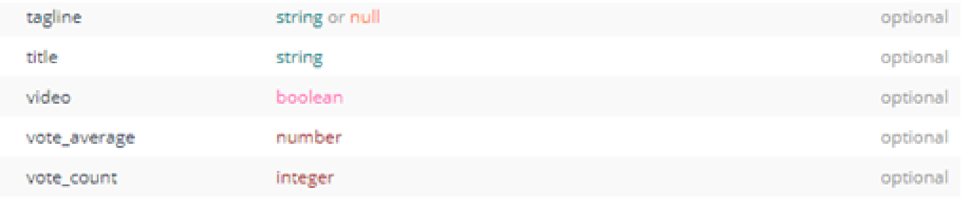
API Schema

The following is an API schema for the “GET/movie/{movie_id}” for The TMDb movie database. This will be used to find additional information about a movie.

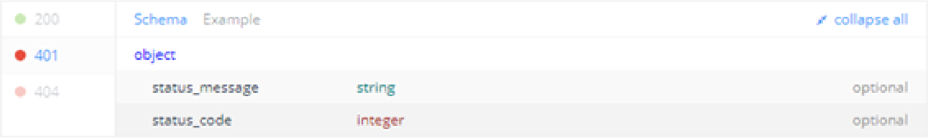


object

adult	boolean		optional
backdrop_path	string or null		optional
belongs_to_collection	null or object		optional
budget	integer		optional
▾ genres	array[object]		optional
id	integer		optional
name	string		optional
homepage	string or null		optional
id	integer		optional
imdb_id	string or null	minLength: 9 maxLength: 9 pattern: ^tt[0-9]{7}	optional
original_language	string		optional
original_title	string		optional
overview	string or null		optional
popularity	number		optional
poster_path	string or null		optional
▾ production_companies	array[object]		optional
name	string		optional
id	integer		optional
logo_path	string or null		optional
origin_country	string		optional
▾ production_countries	array[object]		optional
iso_3166_1	string		optional
name	string		optional
release_date	string	format: date	optional
revenue	integer		optional
runtime	integer or null		optional
▾ spoken_languages	array[object]		optional
iso_639_1	string		optional
name	string		optional
status	string	Allowed Values: Rumored, Planned, In Production, Post Production, Released, Canceled	optional

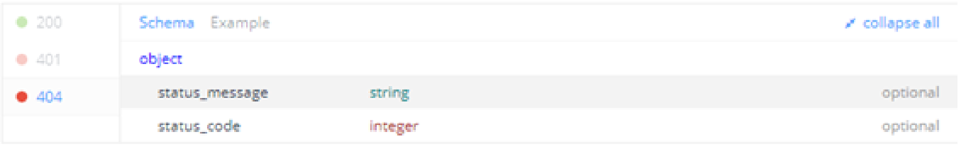


tagline	string or null	optional
title	string	optional
video	boolean	optional
vote_average	number	optional
vote_count	integer	optional



object

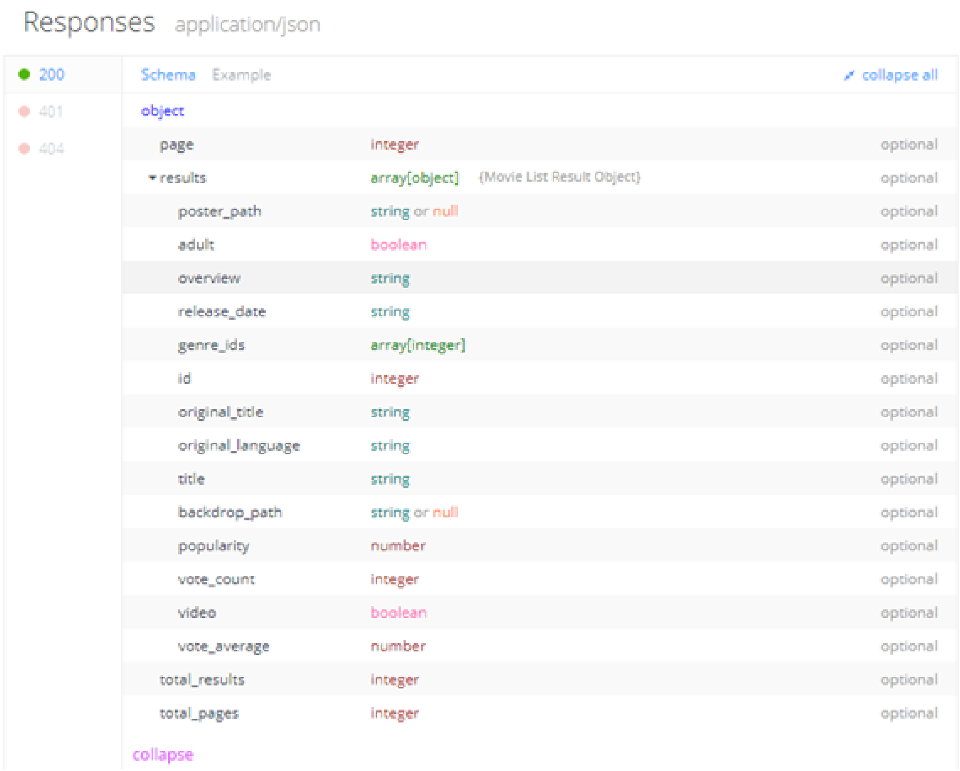
status_message	string	optional
status_code	integer	optional



object

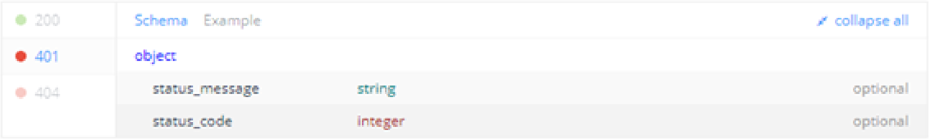
status_message	string	optional
status_code	integer	optional

This is the API Schema for the GET/search/movie request



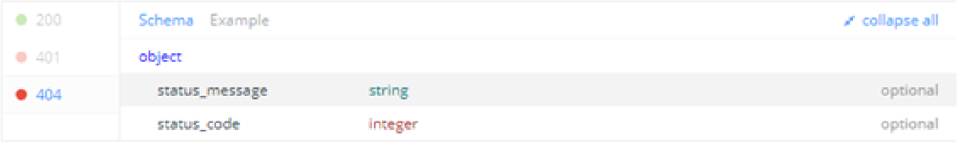
object

page	integer		optional
▾ results	array[object]	{Movie List Result Object}	optional
poster_path	string or null		optional
adult	boolean		optional
overview	string		optional
release_date	string		optional
genre_ids	array[integer]		optional
id	integer		optional
original_title	string		optional
original_language	string		optional
title	string		optional
backdrop_path	string or null		optional
popularity	number		optional
vote_count	integer		optional
video	boolean		optional
vote_average	number		optional
total_results	integer		optional
total_pages	integer		optional



object

status_message	string	optional
status_code	integer	optional

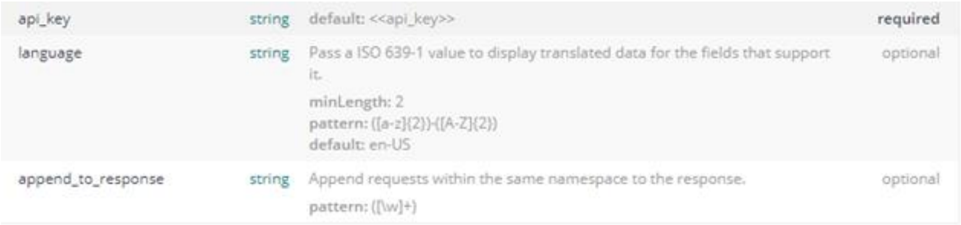


object

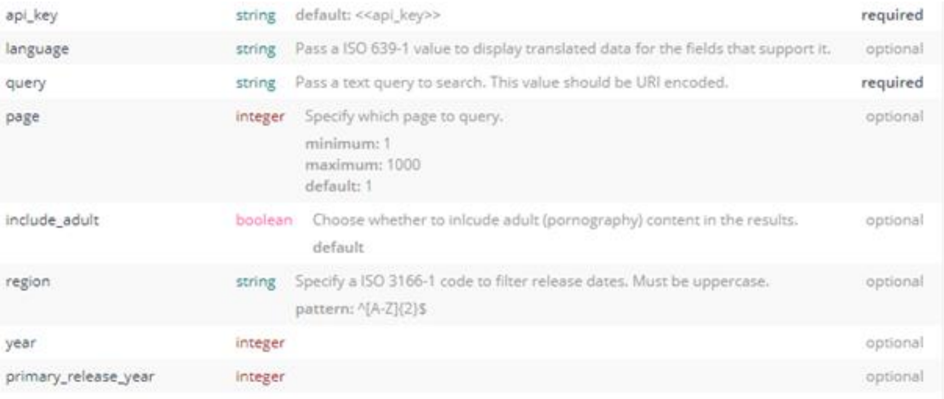
status_message	string	optional
status_code	integer	optional

API Query Strings

These are the sets of query strings for both “GET/movie/{movie_id}” and “GET/search/movie” respectively.



api_key	string	default: <<api_key>>	**required**
language	string	Pass a ISO 639-1 value to display translated data for the fields that support it. minLength: 2 pattern: ([a-z]{2})-([A-Z]{2}) default: en-US	optional
append_to_response	string	Append requests within the same namespace to the response. pattern: ([\w]+)	optional



api_key	string	default: <<api_key>>	**required**
language	string	Pass a ISO 639-1 value to display translated data for the fields that support it.	optional
query	string	Pass a text query to search. This value should be URI encoded.	**required**
page	integer	Specify which page to query. minimum: 1 maximum: 1000 default: 1	optional
include_adult	boolean	Choose whether to inlcude adult (pornography) content in the results. default	optional
region	string	Specify a ISO 3166-1 code to filter release dates. Must be uppercase. pattern: ^[A-Z]{2}$	optional
year	integer		optional
primary_release_year	integer		optional

API Status Codes

Code	HTTP Status	Message
1	200	Success.
2	501	Invalid service: this service does not exist.
3	401	Authentication failed: You do not have permissions to access the service.
4	405	Invalid format: This service doesn't exist in that format.
5	422	Invalid parameters: Your request parameters are incorrect.
6	404	Invalid id: The pre-requisite id is invalid or not found.
7	401	Invalid API key: You must be granted a valid key.
8	403	Duplicate entry: The data you tried to submit already exists.
9	503	Service offline: This service is temporarily offline, try again later.

10	401	Suspended API key: Access to your account has been suspended, contact TMDb.
11	500	Internal error: Something went wrong, contact TMDb.
12	201	The item/record was updated successfully.
13	200	The item/record was deleted successfully.
14	401	Authentication failed.
15	500	Failed.
16	401	Device denied.
17	401	Session denied.
18	400	Validation failed.
19	406	Invalid accept header.
20	422	Invalid date range: Should be a range no longer than 14 days.
21	200	Entry not found: The item you are trying to edit cannot be found.
22	400	Invalid page: Pages start at 1 and max at 1000. They are expected to be an integer.
23	400	Invalid date: Format needs to be YYYY-MM-DD.
24	504	Your request to the backend server timed out. Try again.
25	429	Your request count (#) is over the allowed limit of (40).
26	400	You must provide a username and password.
27	400	Too many append to response objects: The maximum number of remote calls is 20.

28	400	Invalid timezone: Please consult the documentation for a valid timezone.
29	400	You must confirm this action: Please provide a confirm=true parameter.
30	401	Invalid username and/or password: You did not provide a valid login.
31	401	Account disabled: Your account is no longer active. Contact TMDb if this is an error.
32	401	Email not verified: Your email address has not been verified.
33	401	Invalid request token: The request token is either expired or invalid.
34	401	The resource you requested could not be found.

Example API response for 'GET/movie/{movie_id}' (HTTP Status 200)

```
{
  "adult": false,
  "backdrop_path": "/fCayJrkfRaCRCTh8GqN30f8oyQF.jpg",
  "belongs_to_collection": null,
  "budget": 63000000,
  "genres": [
    {
      "id": 18,
      "name": "Drama"
    }
  ],
  "homepage": "",
  "id": 550,
  "imdb_id": "tt0137523",
  "original_language": "en",
  "original_title": "Fight Club",
  "overview": "A ticking-time-bomb insomniac and a slippery soap salesman
channel primal male aggression into a shocking new form of therapy. Their
concept catches on, with underground \"fight clubs\" forming in every town,
until an eccentric gets in the way and ignites an out-of-control spiral toward
oblivion.",
  "popularity": 0.5,
  "poster_path": null,
  "production_companies": [
    {
      "id": 508,
      "logo_path": "/7PzJdsLGlR7oW4J0J5Xcd0pHGRg.png",
      "name": "Regency Enterprises",
      "origin_country": "US"
    },
    {
      "id": 711,
      "logo_path": null,
      "name": "Fox 2000 Pictures",
      "origin_country": ""
    },
    {
      "id": 20555,
      "logo_path": null,
      "name": "Taurus Film",
      "origin_country": ""
    },
    {
      "id": 54050,
      "logo_path": null,
      "name": "Linson Films",
      "origin_country": ""
    },
    {
      "id": 54051,
      "logo_path": null,
      "name": "Atman Entertainment",
      "origin_country": ""
    },
    {
      "id": 54052,
      "logo_path": null,
      "name": "Knickerbocker Films",
      "origin_country": ""
    },
    {
      "id": 25,
      "logo_path": "/qZCc1lty5FzX30aOCVRBLzaVmcp.png",
      "name": "20th Century Fox",
      "origin_country": "US"
    }
  ],
  "production_countries": [
    {
      "iso_3166_1": "US",
      "name": "United States of America"
    }
  ],
  "release_date": "1999-10-12",
  "revenue": 100853753,
  "runtime": 139,
  "spoken_languages": [
    {
      "iso_639_1": "en",
      "name": "English"
    }
  ],
  "status": "Released",
  "tagline": "How much can you know about yourself if you've never been in a
fight?",
  "title": "Fight Club",
  "video": false,
  "vote_average": 7.8,
  "vote_count": 3439
}
```

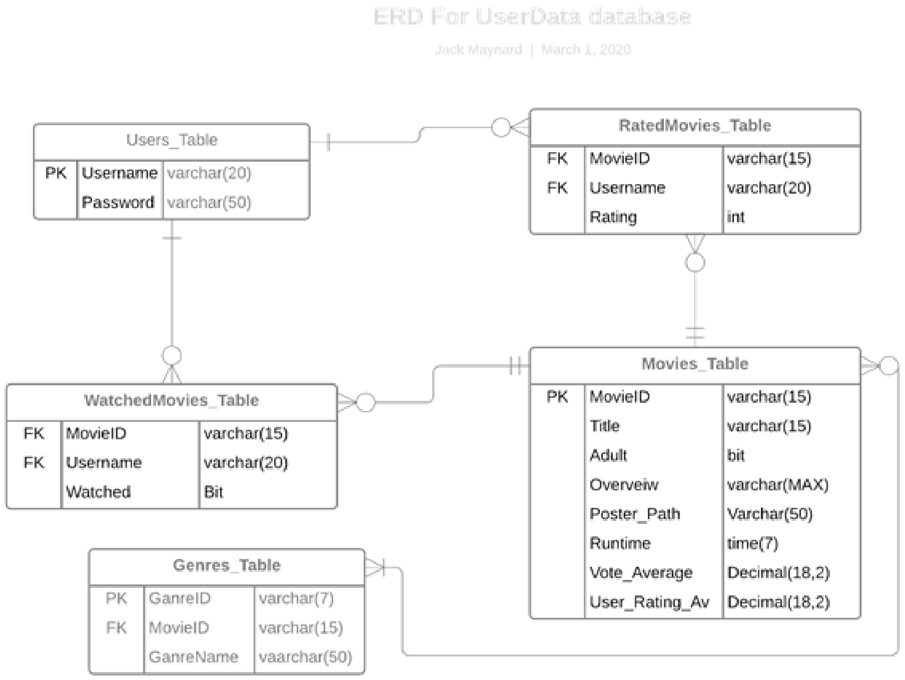
Example API response for ‘GET/search/movie’ (HTTP Status 200)

```
{
  "page": 1,
  "results": [
    {
      "poster_path": "/cezWGskPY5x7GaglTTRN4Fugfb8.jpg",
      "adult": false,
      "overview": "When an unexpected enemy emerges and threatens global safety
and security, Nick Fury, director of the international peacekeeping agency known
as S.H.I.E.L.D., finds himself in need of a team to pull the world back from the
brink of disaster. Spanning the globe, a daring recruitment effort begins!",
      "release_date": "2012-04-25",
      "genre_ids": [
        878,
        28,
        12
      ],
      "id": 24428,
      "original_title": "The Avengers",
      "original_language": "en",
      "title": "The Avengers",
      "backdrop_path": "/hbn46fQaRmlpBuUrEiFqv0GDL6Y.jpg",
      "popularity": 7.353212,
      "vote_count": 8503,
      "video": false,
      "vote_average": 7.33
    },
    {
      "poster_path": "/7cJGRajXMU2aYdTbElIl6FtzOl2.jpg",
      "adult": false,
      "overview": "British Ministry agent John Steed, under direction from
\"Mother\", investigates a diabolical plot by arch-villain Sir August de Wynter
to rule the world with his weather control machine. Steed investigates the
beautiful Doctor Mrs. Emma Peel, the only suspect, but simultaneously falls for
her and joins forces with her to combat Sir August.",
      "release_date": "1998-08-13",
      "genre_ids": [
        53
      ],
      "id": 9320,
      "original_title": "The Avengers",
      "original_language": "en",
      "title": "The Avengers",
      "backdrop_path": "/8YW4rwWQgC2JRlBcpStMNUko13k.jpg",
      "popularity": 2.270454,
      "vote_count": 111,
      "video": false,
      "vote_average": 4.7
    },
    {
      "poster_path": "/t90Y3G8UGQp0f0DrP60wRu9gfrH.jpg",
      "adult": false,
      "overview": "When Tony Stark tries to jumpstart a dormant peacekeeping
program, things go awry and Earth’s Mightiest Heroes are put to the ultimate
test as the fate of the planet hangs in the balance. As the villainous Ultron
emerges, it is up to The Avengers to stop him from enacting his terrible plans,
and soon uneasy alliances and unexpected action pave the way for an epic and
unique global adventure.",
      "release_date": "2015-04-22",
      "genre_ids": [
        28,
        12,
        878
      ],
      "id": 99861,
      "original_title": "Avengers: Age of Ultron",
      "original_language": "en",
      "title": "Avengers: Age of Ultron",
      "backdrop_path": "/570qhjGZmGPrBGnfx70jcwIuBr4.jpg",
      "popularity": 7.557812,
      "vote_count": 3924,
      "video": false,
      "vote_average": 7.4
    },
    {
      "poster_path": "/imTUeuHuxVLxC7sxKqi2G0RPF7k.jpg",
      "adult": false,
      "overview": "This Australian children's film is about scientist Bill
Stewart goes to Fiji with his son Tim to investigate the appearance of the Crown
of Thorns starfish in the reefs off the island.",
      "release_date": "1973-10-20",
      "genre_ids": [],
      "id": 392031,
      "original_title": "Avengers of the Reef",
      "original_language": "en",
      "title": "Avengers of the Reef",
      "backdrop_path": null,
      "popularity": 1.05,
      "vote_count": 0,
      "video": false,
      "vote_average": 0
    },

(Further Results continue on)
```

Database design

ER Diagram



Users_Table

PK	Username	varchar(20)
	Password	varchar(50)

RatedMovies_Table

FK	MovieID	varchar(15)
FK	Username	varchar(20)
	Rating	int

WatchedMovies_Table

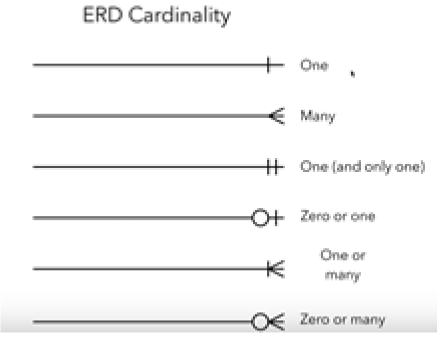
FK	MovieID	varchar(15)
FK	Username	varchar(20)
	Watched	Bit

Movies_Table

PK	MovieID	varchar(15)
	Title	varchar(15)
	Adult	bit
	Overveiw	varchar(MAX)
	Poster_Path	Varchar(50)
	Runtime	time(7)
	Vote_Average	Decimal(18,2)
	User_Rating_Av	Decimal(18,2)

Genres_Table

PK	GanreID	varchar(7)
FK	MovieID	varchar(15)
	GanreName	vaarchar(50)



Testing Strategy

Alpha Testing plan

The alpha testing plan for my program below shows in detail what tests I will carry out in the alpha testing stage, its data type, and what the expected outcome is. The empty spaces are for filling in when the alpha testing is carried out, which are whether the test passed or failed, and a cross reference for any screenshots or relevant information on the testing output data.

Test Number	TEX	Description	Expected result	Actual result	Pass /Fail	Cross Reference
1	T	Try to sign up with a name with less than 10 chars and a password with more than 10 chars	User should sign up successfully			
2	E	Try to sign up again with the same username	User should be refused sign up			
3	T	Try to sign up again with the same password	User should sign up successfully			
4	X	Try To sign up with a 100 character password	User should be refused sign up			
5	X	Try To sign up with a 100 character Username	User should be refused sign up			
6	T	Try to log in with a name and password that has already been signed up	User should log in successfully			
7	E	Try to log in with a non-existing username	User should be refused log in			
8	E	Try to log In with a wrong password but correct username	User should be refused log in, with reason wrong password or username			
9	X	Try To log in with a 100 character password	User should be refused log in			
10	X	Try To log in with a 100 character username	User should be refused log in for wrong password or username			
11	T	Search for an existing movie	User should be given movie as first result, and			

			related thereafter			
12	E	Search for a non-existing movie	Movie will return movie not found, and then related movies where applicable			
13	X	Search for a non-existing +100 character movie	will return movie not found, and related movies			
14	T	Click on a movie icon	Movie page will open, displaying correct movie data			
15	T	Rate movie positively	Movie will store rating, will show rating when page is refreshed. Adds to average user rating correctly. Movies like it will be recommended in recommended section			
16	T	'Watch' Movie	Movie will be added to 'watched' list. Movies like it will be recommended			
17	T	Give movie a bad rating	Will add to rating. Movies like it will be less recommended in recommended section			

Beta Testing plan

There will be two main parts of my beta testing, one is done and documented by myself, the other is a form created by me and filled out by my end user as they go through it themselves. There is also the possibility of having a less technical third party filling out another beta test for my program to give some more constructive feedback other than that of a professional, but that of a customer.

Beta Testing instructions and questionnaire

Open the webpage and follow the instructions to log in/ sign up. Check through the website and use it as you would any other streaming or planning website. Remember to cross reference specific details about movies to check for errors. 'Watch' or 'Rate' at least 1 movie before looking at the recommended section, as otherwise it has no data to go on and is simply random.

Q1. How easy is the program to use? Be as specific as possible.

____

____

____

____

____

Q2. Are there any critical errors (i.e. crashes, non-loading etc.) if so, please state them in detail

____

____

____

____

____

Q3. Are there any data errors in the program? (i.e. movies displayed incorrectly, recommended movies are unrelated etc.)

____

____

____

____

____

Q4. Please name any improvements that need to be made in relation to how the program functions

____

____

____

____

____

Q5. Finally, any other things you may wish to add

____

____

____

Technical solution

The link to a YouTube Video Demo Of the solution is here: https://youtu.be/dZtwj2w2O2Y

Code

Login_Page.aspx (html)

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="Login_Page.aspx.vb" Inherits="Test102.Login_Page" %>


<!DOCTYPE html>


<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
    </head>
<body>
    <form id="form1" runat="server">
    <p style="width: 547px; height: 22px">
        NEA Movie searcher and planner</p>
    <p style="width: 248px; height: 22px">
        Please log in</p>
    <p>
        Username&nbsp;&nbsp;
        <asp:TextBox ID="TxtBox_Username" runat="server"></asp:TextBox>
        <asp:Button ID="Btn_Enter_Credentials" runat="server" CssClass="auto-style1" Text="Enter" OnClick="Btn_Enter_Credentials_Click" />
    </p>
    <p>
        <asp:Label ID="Lbl_Username_Error" runat="server"></asp:Label>
    </p>
    <p>
        Password&nbsp;&nbsp;
        <asp:TextBox ID="TxtBox_Password" runat="server"></asp:TextBox>
    </p>
    </form>
</body>
</html>
            <asp:Label ID="Lbl_Password_Error" runat="server"></asp:Label>
    <br />
    If you dont have an account, Sign up
    <asp:HyperLink ID="HyLi_Sign_Up" runat="server" NavigateUrl="~/Sign_Up.aspx">HERE</asp:HyperLink>
    <br />
    <br />
```

Login_Page.aspx.vb (VB.net code)

```
Public Class Login_Page
    Inherits System.Web.UI.Page
    Private TrueUsername As String


    Protected Sub Btn_Enter_Credentials_Click(sender As Object, e As EventArgs) Handles Btn_Enter_Credentials.Click
        Lbl_Password_Error.Text = ""
        Lbl_Username_Error.Text = ""
        If CheckUserUsername(TxtBox_Username.Text) = True Then
            If GetUserPassword(TxtBox_Password.Text, TxtBox_Username.Text) = True Then
                TrueUsername = TxtBox_Username.Text
                Response.Redirect("Home_Page.aspx?usr=" & TrueUsername & "&i=0&j=0")
            Else
                Lbl_Password_Error.Text = "Password Incorrect"
            End If
        Else
            Lbl_Username_Error.Text = "Username does not exist"
        End If
    End Sub
    Private Function CheckUserUsername(ByVal Username_Val)

        Dim CredentialsCheck As New DBsetup

        Dim SQLStatement As String = "SELECT * FROM [dbo].[Users_Table] WHERE Username='" & Username_Val & "';"

        Return CredentialsCheck.DBCheckUsername(SQLStatement)

        CredentialsCheck.CloseDB()

    End Function


    Private Function GetUserPassword(ByVal Password_Val, ByVal Username_Val)

        Dim CredentialsCheck As New DBsetup

        Dim SQLStatement As String = "SELECT * FROM [dbo].[Users_Table] WHERE Username='" & Username_Val & "';"

        If CredentialsCheck.DBCheckPassword(SQLStatement) = Password_Val Then

            Return True

        Else

            Return False

        End If

        CredentialsCheck.CloseDB()

    End Function

End Class
```

Sign_up.aspx (html)

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="Sign_Up.aspx.vb" Inherits="Test102.Sign_Up" %>


<!DOCTYPE html>


<html xmlns="http://www.w3.org/1999/xhtml">

<head runat="server">

    <title></title>

    </head>

<body>

    <form id="form1" runat="server">
    <div>
      NEA Movie searcher and planner</div>
    <p>
      Please sign up here</p>
    <p>
      Username&nbsp;&nbsp;
      <asp:TextBox ID="TxtBox_Username" runat="server" style="margin-bottom: 0px"></asp:TextBox>
    </p>
    <p>
      <asp:Label ID="Lbl_Username_Error" runat="server"></asp:Label>
    </p>
    <p>
      Password&nbsp;&nbsp;
      <asp:TextBox ID="TxtBox_Password" runat="server" style="margin-bottom: 0px"></asp:TextBox>
    &nbsp;&nbsp;
      <asp:Button ID="Btn_Sign_Up" runat="server" Text="Sign Up" />
    </p>
    <p>
      <asp:Label ID="Lbl_Password_Error" runat="server"></asp:Label>
    </p>
    <p>
      &nbsp;</p>
  </form>
</body>
</html>
```

Sign_up.aspx.vb (VB.net Code)

```
Public Class Sign_Up
```

```
  Inherits System.Web.UI.Page
  Protected Sub Btn_Sign_Up_Click(sender As Object, e As EventArgs) Handles Btn_Sign_Up.Click
    If TxtBox_Password.Text <> Nothing And TxtBox_Username.Text <> Nothing Then
      If CheckIfExists(TxtBox_Username.Text) = False Then
        If Len(TxtBox_Username.Text) <= 20 Then
          If Len(TxtBox_Password.Text) >= 10 And Len(TxtBox_Password.Text) <= 20 Then
            AddUser(TxtBox_Username.Text, TxtBox_Password.text)
            Response.Redirect("Login_Page.aspx")
          Else
            Lbl_Password_Error.Text = "Password Must be less than 20 and more than 10
Characters."
          End If
        Else
          Lbl_Username_Error.Text = "Username Must be less than 10 characters."
        End If
      Else
        Lbl_Username_Error.Text = "Username already exists."
      End If
    End If
  End Sub

  Private Function CheckIfExists(ByVal Username_Val)
    Dim CredentialsCheck As New DBsetup
    Dim SQLStatement As String = "SELECT * FROM [dbo].[Users_Table] WHERE Username='" &
Username_Val & "';"
    Return CredentialsCheck.DBCheckUsername(SQLStatement)
    CredentialsCheck.CloseDB()
  End Function

  Private Sub AddUser(ByVal Username_Val, ByVal Password_Val)
    Dim InsertData As New DBsetup
```

```
        Dim SQLStatement As String = "INSERT INTO [dbo].[Users_Table] (Username, Password) VALUES
('" &
            Username_Val & "', '" & Password_Val & "');"
        InsertData.DBInsertCredentials(SQLStatement)
        InsertData.CloseDB()
    End Sub

End Class
```

Home_Page.aspx (Html)

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="Home_Page.aspx.vb"
Inherits="Test102.Home_Page" %>


<!DOCTYPE html>


<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
    <style type="text/css">
        .auto-style1 {}
        #form1 {
            height: 1383px;
        }
    </style>
</head>
<body>
    <form id="form1" runat="server">
        <div>
            &nbsp;<asp:Label ID="Lbl_Txt_4" runat="server" style="top: 21px; left: 214px; position:
absolute; height: 64px; width: 624px; font-size: large; text-align: center" Text="NEA Movie searcher
and planner"></asp:Label>
            <br />
            <br />
        </div>
        <asp:TextBox ID="Txt_Search_Bar" runat="server" CssClass="auto-style1" Width="717px">Search for movies here!</asp:TextBox>

        <asp:Button ID="Btn_Search_Mov" runat="server" CssClass="auto-style1" width="139px" Text="Go!" />

        <br />

        <br />

        Movies you&#39;ve watched<br />

        <br />

        <asp:Button ID="Btn_Left_0" runat="server" Height="300px" Text="&lt;&lt;" Width="60px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wat_mov_0" runat="server" Height="300px" style="top: -1px; left: 0px; z-index: 1; position: relative;" Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wat_mov_1" runat="server" Height="300px" style="top: 0px; left: 1px; z-index: 1; position: relative;" Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wat_mov_2" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wat_mov_3" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wat_mov_4" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:Button ID="Btn_Right_0" runat="server" Height="300px" style="top: 289px; left: 1422px; " Text="&gt;&gt;" Width="60px" />

        <br />

<%--        <br />

        Movies you want to watch<br />

        <br />

        <asp:Button ID="Btn_Left_1" runat="server" Height="300px" Text="&lt;&lt;" Width="60px" />

        &nbsp;&nbsp;
        <asp:ImageButton ID="Img_Wan_mov_0" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wan_mov_1" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wan_mov_2" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wan_mov_3" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Wan_mov_4" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:Button ID="Btn_Right_1" runat="server" Height="300px" style="top: 289px; left: 1422px; " Text="&gt;&gt;" Width="60px" />

        <br />--%>

        <br />

        Movies Recomended based on what you like<br />

        <br />

        <br />

        <asp:Button ID="Btn_Left_2" runat="server" Height="300px" Text="&lt;&lt;" Width="60px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Rec_mov_0" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Rec_mov_1" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Rec_mov_2" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;
        <asp:ImageButton ID="Img_Rec_mov_3" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:ImageButton ID="Img_Rec_mov_4" runat="server" Height="300px" style="top: 259px; left: 121px; " Width="200px" />

        &nbsp;&nbsp;

        <asp:Button ID="Btn_Right_2" runat="server" Height="300px" style="top: 289px; left: 1422px; " Text="&gt;&gt;" Width="60px" />

        <br />

        <br />

        Log out

        <asp:HyperLink ID="HyperLink1" runat="server" NavigateUrl="~/Login_Page.aspx">Here</asp:HyperLink>

        <br />

    </form>

</body>

</html>
```

Home_Page.aspx.vb (VB.net code)

```
Public Class Home_Page

    Inherits System.Web.UI.Page

    Private TrueUsername As String

    Private Img_Wat_mov_Id(200) As String

    Private img_Rec_mov_Id(200) As String

    Private watchedMovieIds() As String

    Private RecomendedMovieIds(200) As String

    Private MoviePostersWatched(200) As String

    Private MoviePostersRecomended(200) As String

    Private i As Integer

    Private j As Integer

    Private WatchedMoviesCount As Integer


    Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
```

```
TrueUsername = Request.QueryString("usr")
i = Request.QueryString("i")
j = Request.QueryString("j")
Dim LoadingMovies As New DBsetup
Dim GetingMovies As New TMDb_Connection
WatchedMoviesCount = LoadingMovies.DBPullWatchedMovies(TrueUsername)
If WatchedMoviesCount = -100 Then
    MsgBox("Pull Movie Error")
Else
    ReDim watchedMovieIds(WatchedMoviesCount - 1)
    watchedMovieIds = LoadingMovies.DBGetWatchedMovies()
    If WatchedMoviesCount = 0 Then
        For l = 0 To 4
            MoviePostersWatched(l) = "https://bridgercare.org/wp-content/uploads/2018/12/spacer-200x300.png"
        Next
    ElseIf WatchedMoviesCount < 5 Then
        For m = 0 To WatchedMoviesCount - 1
            Img_Wat_mov_Id(m) = watchedMovieIds(m + i)
        Next
        MoviePostersWatched = GetingMovies.GetWatchedMoviePosters(watchedMovieIds, WatchedMoviesCount)
    Else
        For l = 0 To 4
            Img_Wat_mov_Id(l) = watchedMovieIds(l + i)
        Next
        MoviePostersWatched = GetingMovies.GetWatchedMoviePosters(watchedMovieIds, WatchedMoviesCount)
    End If
End If
'LoadingMovies.DBGetWantToWatchMovies()
'LoadingMovies.DBGetRecomendedMovies()
```

```
        LoadingMovies.CloseDB()
        RefreshPosters()
    End Sub

    Protected Sub Btn_Search_Mov_Click(sender As Object, e As EventArgs) Handles Btn_Search_Mov.Click
        If Txt_Search_Bar.Text = "" Or Txt_Search_Bar.Text = "Search for movies here!" Then
        Else
            Response.Redirect("Results_Page.aspx?qry=" & Txt_Search_Bar.Text & "&pg=1" & "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub RefreshPosters()
        Try
            Img_Wat_mov_0.ImageUrl = MoviePostersWatched(i)
        Catch ex As Exception
        End Try
        Try
            Img_Wat_mov_1.ImageUrl = MoviePostersWatched(i + 1)
        Catch ex As Exception
        End Try
        Try
            Img_Wat_mov_2.ImageUrl = MoviePostersWatched(i + 2)
        Catch ex As Exception
        End Try
        Try
            Img_Wat_mov_3.ImageUrl = MoviePostersWatched(i + 3)
        Catch ex As Exception
        End Try
        Try
            Img_Wat_mov_4.ImageUrl = MoviePostersWatched(i + 4)
        Catch ex As Exception
        End Try
        Try
            Img_Rec_mov_0.ImageUrl = MoviePostersRecomended(j)
        Catch ex As Exception
        End Try
        Try
            Img_Rec_mov_1.ImageUrl = MoviePostersRecomended(j + 1)
        Catch ex As Exception
        End Try
        Try
            Img_Rec_mov_2.ImageUrl = MoviePostersRecomended(j + 2)
        Catch ex As Exception
        End Try
        Try
            Img_Rec_mov_3.ImageUrl = MoviePostersRecomended(j + 3)
        Catch ex As Exception
        End Try
        Try
            Img_Rec_mov_4.ImageUrl = MoviePostersRecomended(j + 4)
        Catch ex As Exception
        End Try
    End Sub

    Protected Sub Btn_Left_0_Click(sender As Object, e As EventArgs) Handles Btn_Left_0.Click
        If i = 0 Then
        Else
            i -= 1
            Response.Redirect("Home_Page.aspx?usr=" & TrueUsername & "&i=" & i & "&j=0")
        End If
        RefreshPosters()
```

```
End Sub

Protected Sub Btn_Right_0_Click(sender As Object, e As EventArgs) Handles Btn_Right_0.Click
    If i >= (WatchedMoviesCount - 5) Then
    Else
        i += 1
        Response.Redirect("Home_Page.aspx?usr=" & TrueUsername & "&i=" & i & "&j=0")
    End If
    RefreshPosters()
End Sub

Protected Sub Btn_Left_2_Click(sender As Object, e As EventArgs) Handles Btn_Left_2.Click
    If j = 0 Then
    Else
        For l = -1 To 3
            img_Rec_mov_Id(l + 1) = watchedMovieIds(j + l)
        Next
        j -= 1
    End If
    RefreshPosters()
End Sub

Protected Sub Btn_Right_2_Click(sender As Object, e As EventArgs) Handles Btn_Right_2.Click
    If j = watchedMovieIds.Length Then
    Else
        For l = 1 To 5
            img_Rec_mov_Id(l - 1) = watchedMovieIds(j + l)
        Next
        j += 1
    End If
    RefreshPosters()
End Sub


Protected Sub Img_Wat_mov_0_Click(sender As Object, e As ImageClickEventArgs) Handles Img_Wat_mov_0.Click
    If Img_Wat_mov_Id(0) = Nothing Then
    Else
        Response.Redirect("Movie_Info_Page.aspx?id=" & Img_Wat_mov_Id(0) & "&usr=" & TrueUsername)
    End If
End Sub


Protected Sub Img_Wat_mov_1_Click(sender As Object, e As ImageClickEventArgs) Handles Img_Wat_mov_1.Click
    If Img_Wat_mov_Id(1) = Nothing Then
    Else
        Response.Redirect("Movie_Info_Page.aspx?id=" & Img_Wat_mov_Id(1) & "&usr=" & TrueUsername)
    End If
End Sub


Protected Sub Img_Wat_mov_2_Click(sender As Object, e As ImageClickEventArgs) Handles Img_Wat_mov_2.Click
    If Img_Wat_mov_Id(2) = Nothing Then
    Else
        Response.Redirect("Movie_Info_Page.aspx?id=" & Img_Wat_mov_Id(2) & "&usr=" & TrueUsername)
    End If
End Sub


Protected Sub Img_Wat_mov_3_Click(sender As Object, e As ImageClickEventArgs) Handles Img_Wat_mov_3.Click
    If Img_Wat_mov_Id(3) = Nothing Then
    Else
```

```
            Response.Redirect("Movie_Info_Page.aspx?id=" & Img_Wat_mov_Id(3) & "&usr=" & TrueUsername)
        End If
    End Sub


    Protected Sub Img_Wat_mov_4_Click(sender As Object, e As ImageClickEventArgs) Handles Img_Wat_mov_4.Click
        If Img_Wat_mov_Id(4) = Nothing Then
        Else
            Response.Redirect("Movie_Info_Page.aspx?id=" & Img_Wat_mov_Id(4) & "&usr=" & TrueUsername)
        End If
    End Sub
End Class
```

Results_Page.aspx (html)

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="Results_Page.aspx.vb" Inherits="Test102.Results_Page" %>


<!DOCTYPE html>


<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
    <style type="text/css">
        .auto-style1 {}
    </style>
</head>
<body>
    <form id="form1" runat="server">
        <div>
            <br />
            <br />
        <asp:TextBox ID="Txt_Search_Bar" runat="server" CssClass="auto-style1" Width="1002px"
Height="40px">Search for movies here!</asp:TextBox>

        </div>

        <asp:Label ID="Lbl_Text_3" runat="server" style="top: 21px; left: 231px; position: absolute;
height: 48px; width: 636px; text-align: center; font-size: large" Text="NEA Movie searcher and
planner"></asp:Label>

        <p>

            <asp:Button ID="btn_up_page" runat="server" Text="up" Width="121px" />

        </p>

        <p>

            <asp:Button ID="Btn_Search_Mov" runat="server" style="top: 109px; left: 1039px; position:
absolute; height: 39px; width: 101px; margin-right: 0px" Text="Go!" />

            <asp:ImageButton ID="Mov_0" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_1" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_2" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_3" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_4" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            </p>

        <p>

            <asp:ImageButton ID="Mov_5" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_6" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_7" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;

            <asp:ImageButton ID="Mov_8" runat="server" Height="300px" Width="200px" />

&nbsp;&nbsp;
```

```
      <asp:ImageButton ID="Mov_9" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      </p>
    <p>
      <asp:ImageButton ID="Mov_10" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_11" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_12" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_13" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_14" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      </p>
    <p>
      <asp:ImageButton ID="Mov_15" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_16" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_17" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_18" runat="server" Height="300px" Width="200px" />
&nbsp;&nbsp;
      <asp:ImageButton ID="Mov_19" runat="server" Height="300px" Width="200px" />
      </p>
    <p>
      <asp:Button ID="btn_down_page" runat="server" Text="down" Width="121px" />

&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;
```

```
&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;&nbsp;
            <asp:Button ID="Btn_Back_home" runat="server" Text="Back" />
        </p>
    </form>
</body>
</html>
```

Results_Page.aspx.vb (VB.net code)

```
Public Class Results_Page
    Inherits System.Web.UI.Page
    Private SearchQuery As String
    Private SearchResultIDs(19) As String
    Private Mov_Poster(19) As String
    Private PageNum As Integer
    Private Total_Search_Results As Integer
    Private TrueUsername As String
    Protected Sub Page_Init(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
        If IsCallback = False Then
            Dim APIcall As New TMDb_Connection
            SearchQuery = Request.QueryString("qry")
            PageNum = Request.QueryString("pg")
            TrueUsername = Request.QueryString("usr")
            SearchResultIDs = APIcall.SearchAPI(SearchQuery, "id", PageNum)
            Total_Search_Results = APIcall.Return_Total_Search_Results()
            Txt_Search_Bar.Text = SearchQuery
            Mov_Poster = APIcall.GetresultMoviePosters(SearchResultIDs)
            RefreshMovies()
        End If
    End Sub
```

```
   Protected Sub Btn_Search_Mov_Click(sender As Object, e As EventArgs) Handles
Btn_Search_Mov.Click

      If Txt_Search_Bar.Text = "" Or Txt_Search_Bar.Text = "Search for movies here!" Then

      Else

         Response.Redirect("Results_Page.aspx?qry=" & SearchQuery & "&pg=" & PageNum.ToString)

      End If

   End Sub


   Private Sub RefreshMovies()

      Mov_0.ImageUrl = Mov_Poster(0)

      Mov_1.ImageUrl = Mov_Poster(1)

      Mov_2.ImageUrl = Mov_Poster(2)

      Mov_3.ImageUrl = Mov_Poster(3)

      Mov_4.ImageUrl = Mov_Poster(4)

      Mov_5.ImageUrl = Mov_Poster(5)

      Mov_6.ImageUrl = Mov_Poster(6)

      Mov_7.ImageUrl = Mov_Poster(7)

      Mov_8.ImageUrl = Mov_Poster(8)

      Mov_9.ImageUrl = Mov_Poster(9)

      Mov_10.ImageUrl = Mov_Poster(10)

      Mov_11.ImageUrl = Mov_Poster(11)

      Mov_12.ImageUrl = Mov_Poster(12)

      Mov_13.ImageUrl = Mov_Poster(13)

      Mov_14.ImageUrl = Mov_Poster(14)

      Mov_15.ImageUrl = Mov_Poster(15)

      Mov_16.ImageUrl = Mov_Poster(16)

      Mov_17.ImageUrl = Mov_Poster(17)

      Mov_18.ImageUrl = Mov_Poster(18)

      Mov_19.ImageUrl = Mov_Poster(19)

   End Sub
```

```
    Protected Sub btn_up_page_Click(sender As Object, e As EventArgs) Handles btn_up_page.Click
        If PageNum = 1 Then
        Else
            PageNum -= 1
            Response.Redirect("Results_Page.aspx?qry=" & SearchQuery & "&pg=" & PageNum.ToString
& "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub btn_down_page_Click(sender As Object, e As EventArgs) Handles
btn_down_page.Click
        If PageNum = Math.Ceiling(Total_Search_Results / 20) Then
        Else
            PageNum += 1
            Response.Redirect("Results_Page.aspx?qry=" & SearchQuery & "&pg=" & PageNum.ToString
& "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub Mov_0_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_0.Click
        If SearchResultIDs(0) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(0) & "&usr=" &
TrueUsername)
        End If
    End Sub

    Protected Sub Mov_1_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_1.Click
        If SearchResultIDs(1) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(1) & "&usr=" &
TrueUsername)
        End If
    End Sub

    Protected Sub Mov_2_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_2.Click
        If SearchResultIDs(2) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(2) & "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub Mov_3_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_3.Click
        If SearchResultIDs(3) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(4) & "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub Mov_4_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_4.Click
        If SearchResultIDs(5) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(5) & "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub Mov_5_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_5.Click
        If SearchResultIDs(5) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(5) & "&usr=" & TrueUsername)
        End If
    End Sub

    Protected Sub Mov_6_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_6.Click
        If SearchResultIDs(6) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(6) & "&usr=" &
TrueUsername)
        End If
    End Sub

    Protected Sub Mov_7_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_7.Click
        If SearchResultIDs(7) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(7) & "&usr=" &
TrueUsername)
        End If
    End Sub

    Protected Sub Mov_8_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_8.Click
        If SearchResultIDs(8) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(8) & "&usr=" &
TrueUsername)
        End If
    End Sub

    Protected Sub Mov_9_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_9.Click
        If SearchResultIDs(9) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(9) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_10_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_10.Click
        If SearchResultIDs(10) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(10) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_11_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_11.Click
        If SearchResultIDs(11) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(11) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_12_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_12.Click
        If SearchResultIDs(12) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(12) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_13_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_13.Click
        If SearchResultIDs(13) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(13) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_14_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_14.Click
        If SearchResultIDs(14) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(14) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_15_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_15.Click
        If SearchResultIDs(15) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(15) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_16_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_16.Click
        If SearchResultIDs(16) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(16) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_17_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_17.Click
        If SearchResultIDs(17) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(17) & "&usr=" &
TrueUsername)
        End If
    End Sub


    Protected Sub Mov_18_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_18.Click
        If SearchResultIDs(18) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(18) & "&usr=" & TrueUsername)
        End If
    End Sub


    Protected Sub Mov_19_Click(sender As Object, e As ImageClickEventArgs) Handles Mov_19.Click
        If SearchResultIDs(19) = Nothing Then
        Else
            Response.Redirect("Movie_Info_page.aspx?id=" & SearchResultIDs(19) & "&usr=" & TrueUsername)
        End If
    End Sub


    Protected Sub Btn_Back_home_Click(sender As Object, e As EventArgs) Handles Btn_Back_home.Click
        Response.Redirect("Home_Page.aspx?usr=" & TrueUsername & "&i=0&j=0")
    End Sub
End Class
```

Movie_Info_Page.aspx (html)

```
<%@ Page Language="vb" AutoEventWireup="false" CodeBehind="Movie_Info_Page.aspx.vb" Inherits="Test102.WebForm1" %>


<!DOCTYPE html>


<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
    <title></title>
    <style type="text/css">
```

```
.auto-style1 {
   top: 138px;
   left: 33px;
   position: absolute;
   height: 616px;
   width: 398px;
}
#form1 {
   text-align: left;
   position: absolute;
   top: 106px;
   left: 51px;
   float: left;
   height: 864px;
   width: 1610px;
   margin-top: 0px;
}
.auto-style2 {
   text-align: center;
   font-size: large;
   top: 4px;
   left: 208px;
   position: absolute;
   height: 59px;
   width: 451px;
}
.auto-style3 {
   top: 67px;
   left: 500px;
   height: 47px;
   width: 266px;
```

```
    position: absolute;
    text-align: center;
    font-size: medium;
    margin-top: 7px;
}
.auto-style4 {
    top: 142px;
    left: 451px;
    position: absolute;
    height: 32px;
    width: 130px;
    text-align: center;
    font-size: x-small;
}
.auto-style5 {
    top: 144px;
    left: 599px;
    position: absolute;
    height: 30px;
    width: 507px;
    font-size: x-small;
}
.auto-style6 {
    top: 188px;
    left: 452px;
    position: absolute;
    height: 32px;
    width: 130px;
    text-align: center;
    font-size: x-small;
}
```

```
.auto-style7 {
   top: 189px;
   left: 599px;
   position: absolute;
   height: 32px;
   width: 535px;
   font-size: x-small;
}
.auto-style8 {
   top: 233px;
   left: 451px;
   position: absolute;
   height: 32px;
   width: 130px;
   text-align: center;
   font-size: x-small;
}
.auto-style9 {
   top: 234px;
   left: 600px;
   position: absolute;
   height: 33px;
   width: 510px;
   font-size: x-small;
}
.auto-style10 {
   top: 277px;
   left: 451px;
   position: absolute;
   height: 32px;
   width: 131px;
```

```
            text-align: center;

            font-size: x-small;

        }

        </style>

</head>

<body>

    <form id="form1" runat="server">

        <div>

            <asp:Label ID="Lbl_Movie_Name" runat="server" BorderColor="Black" BorderStyle="Solid"
BorderWidth="2px" CssClass="auto-style2"></asp:Label>

            <br />

            <br />

            <br />

        </div>

        <asp:Label ID="Lbl_Ganres_Idn" runat="server" BorderColor="Black" BorderWidth="1px"
CssClass="auto-style4" Text="Ganres:"></asp:Label>

        <asp:Button ID="Btn_watch_mov" runat="server" style="top: 418px; left: 899px; position:
absolute; height: 56px; width: 242px" Text="Watch Movie" />

        <asp:Label ID="Lbl_Ganres_val" runat="server" CssClass="auto-style5"></asp:Label>

        <asp:Label ID="Lbl_Age_Rating_Val" runat="server" BorderColor="Black" BorderStyle="None"
BorderWidth="1px" CssClass="auto-style7"></asp:Label>

        <asp:Label ID="Lbl_Runtime_Idn" runat="server" BackColor="White" BorderColor="Black"
BorderStyle="Solid" BorderWidth="1px" CssClass="auto-style8" Text="Runtime:"></asp:Label>

        <asp:Label ID="Lbl_Runtime_Val" runat="server" CssClass="auto-style9"></asp:Label>

        <asp:Label ID="Lbl_RT_Rating_Idn" runat="server" BorderColor="Black" BorderStyle="Solid"
BorderWidth="1px" CssClass="auto-style10" Text="RT Rating:"></asp:Label>

        <asp:Label ID="Lbl_RT_Rating_Val" runat="server" style="top: 277px; left: 600px; position:
absolute; height: 32px; width: 445px; font-size: x-small;"></asp:Label>

        <asp:Label ID="Lbl_Your_Rating_Idn" runat="server" BorderColor="Black" BorderWidth="1px"
style="top: 365px; left: 451px; position: absolute; height: 32px; width: 130px; font-size: x-small;"
Text="Your Rating:"></asp:Label>

        <asp:Label ID="Lbl_User_Rating_Val" runat="server" style="top: 321px; left: 600px; position:
absolute; height: 32px; width: 485px; font-size: x-small;"></asp:Label>
```

```
        <asp:Label ID="Lbl_User_Rating_Idn" runat="server" BorderColor="Black" BorderWidth="1px" style="top: 321px; left: 451px; position: absolute; height: 32px; width: 130px; font-size: x-small; text-align: center;" Text="Avg Rating:"></asp:Label>

        <asp:TextBox ID="Txt_Rating" runat="server" style="top: 362px; left: 767px; position: absolute; height: 26px; width: 128px; font-size: x-small; right: 707px;"></asp:TextBox>

        <asp:Label ID="Lbl_Text_1" runat="server" BorderColor="Black" BorderStyle="Solid" BorderWidth="2px" CssClass="auto-style3" Text="Movie Details"></asp:Label>

        <asp:Label ID="Lbl_Movie_Synopsis_Val" runat="server" style="top: 497px; left: 450px; position: absolute; height: 225px; width: 867px; font-size: small;"></asp:Label>

        <asp:Label ID="Lbl_Text_2" runat="server" BorderColor="Black" BorderWidth="2px" style="top: 435px; left: 451px; position: absolute; height: 50px; width: 151px; font-size: medium; text-align: center; margin-top: 0px" Text="Synopsis"></asp:Label>

        <asp:Label ID="Lbl_Age_rating_Idn" runat="server" BorderColor="Black" BorderStyle="Solid" BorderWidth="1px" CssClass="auto-style6" Text="Age rating:"></asp:Label>

        <asp:Button ID="Btn_Enter_Rating" runat="server" Height="44px" style="top: 357px; left: 920px; position: absolute" Text="Enter" Width="136px" />

        <asp:Image ID="Img_Movie_Poster" runat="server" CssClass="auto-style1" Height="600px" Width="400px" />

        <br />

        <br />

        <br />

        <asp:Label ID="Lbl_Your_Rating_Val" runat="server" style="font-size: x-small; top: 366px; left: 606px; position: absolute; height: 29px; width: 117px"></asp:Label>

        <asp:Button ID="Btn_Back_home" runat="server" style="top: 770px; left: 446px; position: absolute; height: 56px; width: 108px; margin-top: 0px" Text="Back" />

    </form>

</body>

</html>
```

Movie_Info_Page.aspx.vb (VB.net code)

```
Public Class WebForm1

    Inherits System.Web.UI.Page

    Private MovieIDTemp As String

    Private TrueUsernametemp As String


    Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
```

```
        MovieIDTemp = Request.QueryString("id")
        TrueUsernametemp = Request.QueryString("usr")
        Dim GetMovieInfo As New TMDb_Connection
        Dim GetUserInfo As New DBsetup
        Dim temp As Boolean = GetMovieInfo.GetMovieAPI(MovieIDTemp, "adult")
        If temp = True Then
            Lbl_Age_Rating_Val.Text = "18+"
        ElseIf temp = False Then
            Lbl_Age_Rating_Val.Text = "All ages"
        Else
            Lbl_Age_Rating_Val.Text = "Data not found"
        End If
        Lbl_Ganres_val.Text = GetMovieInfo.GetMovieAPI(MovieIDTemp, "name")
        Lbl_Movie_Name.Text = GetMovieInfo.GetMovieAPI(MovieIDTemp, "title")
        Lbl_Movie_Synopsis_Val.Text = GetMovieInfo.GetMovieAPI(MovieIDTemp, "overview")
        Lbl_RT_Rating_Val.Text = GetMovieInfo.GetMovieAPI(MovieIDTemp, "vote_average") & " out of 
10"
        Lbl_Runtime_Val.Text = GetMovieInfo.GetMovieAPI(MovieIDTemp, "runtime") & " Minutes"
        Img_Movie_Poster.ImageUrl = GetMovieInfo.GetMoviePoster(MovieIDTemp, "poster_path")
        Dim Value_Av_rating As String = GetUserInfo.GetAvgUserRatings(MovieIDTemp)
        If Value_Av_rating = Nothing Then
            Lbl_User_Rating_Val.Text = "Unrated"
        Else
            Lbl_User_Rating_Val.Text = Value_Av_rating
        End If
        Lbl_Your_Rating_Val.Text = GetUserInfo.GetUserRating(MovieIDTemp, TrueUsernametemp)
        temp = GetUserInfo.DBcheckIfWatched(MovieIDTemp, TrueUsernametemp)
        If temp = True Then
            Btn_watch_mov.Text = "Movie Watched"
        ElseIf temp = False Then
        End If
        GetUserInfo.CloseDB()
    End Sub


    Protected Sub Btn_Enter_Rating_Click(sender As Object, e As EventArgs) Handles
Btn_Enter_Rating.Click
        Dim InsertRatingDB As New DBsetup
        If Txt_Rating.Text = "" Then
        Else
            InsertRatingDB.AddYourRating(MovieIDTemp, TrueUsernametemp, Txt_Rating.Text)
            Lbl_User_Rating_Val.Text = InsertRatingDB.GetAvgUserRatings(MovieIDTemp)
            Lbl_Your_Rating_Val.Text = InsertRatingDB.GetUserRating(MovieIDTemp,
TrueUsernametemp)
            Txt_Rating.Text = ""
        End If
        InsertRatingDB.CloseDB()
    End Sub


    Protected Sub Btn_watch_mov_Click(sender As Object, e As EventArgs) Handles
Btn_watch_mov.Click
        Dim DBInsert As New DBsetup
        If Btn_watch_mov.Text = "Movie Watched" Then
        Else
            DBInsert.WatchedMovies(MovieIDTemp, TrueUsernametemp)
        End If
        Btn_watch_mov.Text = "Movie Watched"
    End Sub


    Protected Sub Btn_Back_home_Click(sender As Object, e As EventArgs) Handles
Btn_Back_home.Click
        Response.Redirect("Home_Page.aspx?usr=" & TrueUsernametemp & "&i=0&j=0")
    End Sub
End Class
```

Tmdb_connection.vb (Single class)

```
Imports System.IO
Imports System.Net
Imports Newtonsoft.Json.Linq
Public Class TMDb_Connection
    Private API_Key As String = "c1acc66d602a81899221d1bd24734a36"
    Private API_url As String = "https://api.themoviedb.org/3"
    Private API_Poster_Base_Path As String = "https://image.tmdb.org/t/p/w500/"
    Private Pagintaion As String
    Private total_results As Integer
    Public Function SearchAPI(ByVal API_Query As String, ByVal ObjectToken As String, ByVal pageNum As Integer)
        Pagintaion = pageNum.ToString
        Dim Response As HttpWebResponse
        Dim postData As String = "api_key=" & API_Key & "&query=" & WebUtility.UrlEncode(API_Query) & "&page=" & Pagintaion
        Dim Request As HttpWebRequest = DirectCast(HttpWebRequest.Create(API_url & "/search/movie?" & postData), HttpWebRequest)
        Request.Method = "GET"
        Try
            Response = DirectCast(Request.GetResponse(), HttpWebResponse)
            Dim Stream As Stream = Response.GetResponseStream()
            Dim reader As New StreamReader(Stream, Encoding.GetEncoding("utf-8"))
            Dim responseFromServer As String = reader.ReadToEnd()
            reader.Close()
            Response.Close()
            Dim obj As JObject = JObject.Parse(responseFromServer)
            total_results = obj.SelectToken("total_results")
            Dim objarray As JArray = JArray.Parse(obj.SelectToken("results").ToString)
            Dim i As Integer = 0
            Dim temp(19) As String
            For Each results As JObject In objarray
                temp(i) = results.SelectToken(ObjectToken).ToString()
                i += 1
            Next
            Return temp
        Catch ex As Exception
            MsgBox(ex.Message)
            Return "Error"
        End Try
    End Function

    Public Function GetMovieAPI(ByVal MovieID As String, ByRef ObjectToken As String)
        Dim Response As HttpWebResponse
        Dim postData As String = MovieID & "?api_key=" & API_Key
        Dim Request As HttpWebRequest = DirectCast(HttpWebRequest.Create(API_url & "/movie/" & 
postData), HttpWebRequest)
        Request.Method = "GET"
        Dim temp1 As String = ""
        Try
            Response = DirectCast(Request.GetResponse(), HttpWebResponse)
            Dim Stream As Stream = Response.GetResponseStream()
            Dim reader As New StreamReader(Stream, Encoding.GetEncoding("utf-8"))
            Dim responseFromServer As String = reader.ReadToEnd()
            reader.Close()
            Response.Close()
            Dim obj As JObject = JObject.Parse(responseFromServer)
            If ObjectToken = "name" Then
                Dim objarray As JArray = JArray.Parse(obj.SelectToken("genres").ToString)
                For Each results As JObject In objarray
                    temp1 = results.SelectToken(ObjectToken).ToString() & ", " & temp1
                Next
                Return temp1
            ElseIf ObjectToken = "poster_path" Then
                Dim l As String = obj.SelectToken(ObjectToken).ToString
                If l = Nothing Or l = "Null" Then
                    Return "https://storage.googleapis.com/storage.digitalgravity.io/digitalgravity-wordpress-storage/2020/01/bbc7e531-amanda-smigielski-200x300.jpg"
                Else
                    Return (API_Poster_Base_Path & l)
                End If
            Else
                Return obj.SelectToken(ObjectToken)
            End If
        Catch ex As Exception
            MsgBox(ex.Message)
        End Try
    End Function

    Public Function GetWatchedMoviePosters(ByVal IDs(), NoOfPosters)
        Dim MoviePosterPaths(NoOfPosters - 1) As String
        For i = 0 To (NoOfPosters - 1)
            If IDs(i) = Nothing Then
                MoviePosterPaths(i) = "https://bridgercare.org/wp-content/uploads/2018/12/spacer-200x300.png"
            Else
                MoviePosterPaths(i) = GetMovieAPI(IDs(i), "poster_path")
            End If
        Next
        Return MoviePosterPaths
    End Function

    Public Function GetresultMoviePosters(ByVal IDs())
```

```
        Dim MoviePosterPaths(19) As String
        For i = 0 To (19)
            If IDs(i) = Nothing Then
                MoviePosterPaths(i) = "https://bridgercare.org/wp-content/uploads/2018/12/spacer-200x300.png"
            Else
                MoviePosterPaths(i) = GetMovieAPI(IDs(i), "poster_path")
            End If
        Next
        Return MoviePosterPaths
    End Function

    Public Function GetMoviePoster(ByVal Id, ByVal ObjectToken)
        Return GetMovieAPI(Id, ObjectToken)
    End Function
    Public Function Return_Total_Search_Results()
        Return total_results
    End Function
End Class
```

DBsetup.vb (single class)

```
Public Class DBsetup
    Private conStr As String = "Server=localhost\SQLEx;Database=UserData;User Id=sa;Password=password123;"
    Private DBcon As SqlConnection
    Private DBcmd As SqlCommand
    Private DBr As SqlDataReader
    Private SQLstr As String
    Private TrueUsername
    Private WatchedMovieIDs() As String
    Private x As Integer

    Sub New()
```

```
        DBcon = New SqlConnection(conStr)
        Try
            DBcon.Open()
        Catch ex As Exception
            MsgBox(ex.Message)
        End Try
    End Sub

    Public Function DBCheckUsername(ByVal SQLStatement)
        Dim ReaderResult As Boolean
        SQLstr = SQLStatement
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBr = DBcmd.ExecuteReader()
            DBr.Read()
            ReaderResult = DBr.HasRows()
        Catch ex As Exception
            MsgBox(ex.Message)
            ReaderResult = False
        End Try
        DBr.Close()
        Return ReaderResult
    End Function

    Public Function DBCheckPassword(ByVal SQLStatement)
        Dim ReaderResult As String = ""
        SQLstr = SQLStatement
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBr = DBcmd.ExecuteReader()
            DBr.Read()
            ReaderResult = DBr("Password")
        Catch ex As Exception
            MsgBox(ex.Message)
            ReaderResult = "ERROR"
        End Try
        DBr.Close()
        Return ReaderResult
    End Function

    Public Function DBcheckIfWatched(ByVal MovieIDTemp, ByVal TrueUsername)
        Dim ReaderResult As Boolean
        SQLstr = "SELECT * FROM [dbo].[WatchedMovies_Table] WHERE Username='" & TrueUsername
& "' AND MovieID='" & MovieIDTemp & "';"
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBr = DBcmd.ExecuteReader()
            DBr.Read()
            ReaderResult = DBr.HasRows
        Catch ex As Exception
            MsgBox(ex.Message)
        End Try
        DBr.Close()
        Return ReaderResult
    End Function

    Public Sub DBInsertCredentials(ByVal SQLStatement)
        SQLstr = SQLStatement
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBcmd.ExecuteNonQuery()
        Catch ex As Exception
```

```
            MsgBox(ex.Message)
        End Try
    End Sub


    Public Function DBPullWatchedMovies(ByVal Username_Val)
        Dim ReaderResult As Integer
        x = 0
        Dim temp As Integer = x
        Try
            SQLstr = "SELECT COUNT(*) FROM [dbo].[WatchedMovies_Table] WHERE Username='" &
Username_Val & "';"
            DBcmd = New SqlCommand(SQLstr, DBcon)
            temp = Convert.ToInt32(DBcmd.ExecuteScalar()).ToString
            ReDim WatchedMovieIDs(temp)
            SQLstr = "SELECT * FROM [dbo].[WatchedMovies_Table] WHERE Username='" &
Username_Val _
                & "' AND Watched='1';"
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBr = DBcmd.ExecuteReader()
            Do While DBr.Read()
                x = x + 1
                WatchedMovieIDs(x - 1) = DBr("MovieID")
            Loop
            ReaderResult = temp
        Catch ex As Exception
            MsgBox(ex.Message)
            ReaderResult = -100
        End Try
        DBr.Close()
        Return ReaderResult
    End Function
```

```
  Public Sub AddYourRating(ByVal MovieId, ByVal Username, ByVal Rating_Val)
    SQLstr = "SELECT * FROM [dbo].[RatedMovies_Table] WHERE MovieID='" & MovieId _
      & "' AND Username='" & Username & "';"
    DBcmd = New SqlCommand(SQLstr, DBcon)
    DBr = DBcmd.ExecuteReader()
    If DBr.HasRows() Then
      DBr.Close()
      SQLstr = "UPDATE [dbo].[RatedMovies_Table] SET Rating='" & Rating_Val &
        "' WHERE MovieID='" & MovieId & "' AND Username='" & Username & "';"
      Try
        DBcmd = New SqlCommand(SQLstr, DBcon)
        DBcmd.ExecuteNonQuery()
      Catch ex As Exception
        MsgBox(ex.Message)
      End Try
    Else
      DBr.Close()
      SQLstr = "INSERT INTO [dbo].[RatedMovies_Table] (MovieID, Username, Rating) VALUES ('" &
      MovieId & "', '" & Username & "', '" & Rating_Val & "');"
      Try
        DBcmd = New SqlCommand(SQLstr, DBcon)
        DBcmd.ExecuteNonQuery()
      Catch ex As Exception
        MsgBox(ex.Message)
      End Try
    End If
  End Sub


  Public Function GetAvgUserRatings(ByVal MovieID)
    SQLstr = "SELECT AVG(rating) FROM [dbo].[RatedMovies_Table] WHERE MovieID='" & MovieID
& "';"
```

```
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            Return DBcmd.ExecuteScalar().ToString()
        Catch ex As Exception
            MsgBox(ex.Message)
            Return "E"
        End Try
    End Function

    Public Function GetUserRating(ByVal MovieID, ByVal Username)
        Dim ReaderResult As String = ""
        SQLstr = "SELECT * FROM [dbo].[RatedMovies_Table] WHERE MovieID='" & MovieID _
            & "' AND Username='" & Username & "';"
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBr = DBcmd.ExecuteReader()
            DBr.Read()
            ReaderResult = DBr("rating")
        Catch ex As Exception
            ReaderResult = "Unrated"
        End Try
        DBr.Close()
        Return ReaderResult
    End Function

    'Public Function DBGetWantToWatchMovies()
    '    Dim IDs() As String
    '    Return IDs
    'End Function

    Public Function DBGetRecomendedMovies()
```

```
        Dim IDs() As String = Array.CreateInstance(GetType(String), 0)
        Return IDs
    End Function

    Public Sub CloseDB()
        DBcon.Close()
    End Sub

    Public Function DBGetWatchedMovies()
        Return WatchedMovieIDs
    End Function

    Public Sub WatchedMovies(ByVal MovieID, ByRef Username)
        SQLstr = "INSERT INTO [dbo].[WatchedMovies_Table] (MovieID, Username, Watched) VALUES
('" &
        MovieID & "', '" & Username & "', 'True');"
        Try
            DBcmd = New SqlCommand(SQLstr, DBcon)
            DBcmd.ExecuteNonQuery()
        Catch ex As Exception
            MsgBox(ex.Message)
        End Try
    End Sub

End Class
```

Testing

The first part of the testing will be done via a youtube video, timestamps for each test will be written in the cross refreance section. The Link to the youtube video is here: https://youtu.be/vaEd-EhHwwI

Alpha testing

Test Number	TEX	Description	Expected result	Actual result	Pass/Fail	Cross Reference
1	T	Try to sign up with a name with less than 10 chars and a password with more than 10 chars	User should sign up successfully	User signs up successfully	P	00:39
2	E	Try to sign up again with the same username	User should be refused sign up	User refused sign up	p	1:24
3	T	Try to sign up again with the same password	User should sign up successfully	User signs up successfully	p	1:52
4	X	Try To sign up with a 100 character password	User should be refused sign up	User refused sign up	p	2:20
5	X	Try To sign up with a 100 character Username	User should be refused sign up	User refused sign up	p	3:07
6	T	Try to log in with a name and password that has already been signed up	User should log in successfully	User logs in successfully	p	3:48
7	E	Try to log in with a non-existing username	User should be refused log in	User refused log in	p	4:17
8	E	Try to log In with a wrong password but correct username	User should be refused log in, with reason wrong password or username	User refused log in	p	4:35
9	X	Try To log in with a 100 character password	User should be refused log in	User refused log in	p	5:00

10	X	Try To log in with a 100 character username	User should be refused log in for wrong password or username	User refused log in	p	5:20
11	T	Search for an existing movie	User should be given movie as first result, and related thereafter	User given movie as first result, and related thereafter	p	5:58
12	E	Search for a non-existing movie	Movie will return movie not found, and then related movies where applicable	No Movies were returned and no related movies were returned as none apply	p	6:35
13	X	Search for a non-existing +100 character movie	will return movie not found, and related movies	No movies were returned no related movies apply	p	7:25
14	T	Click on a movie icon	Movie page will open, displaying correct movie data	Movie page opens, displaying correct movie data	p	8:09
15	T	Rate movie positively	Movie will store rating, will show rating when page is refreshed. Adds to average user rating correctly. Movies like it will be recommended in recommended section	Movie stores rating for user and average rating. Genre is also stored in the database but no recommended system yet used	P F	9:14
16	T	'Watch' Movie	Movie will be added to 'watched' list. Movies like it will be recommended	Movie will be added to 'watched' list.	P	9:46
17	T	Give movie a bad rating	Will add to rating. Movies like it will be less recommended in recommended section	Rating Changes to lower value. Genres still stored. No recommended functions yet	P F	10:09

User testing (Beta testing)

This will be the section of feedback for one or two users after using the program.

User1: Pedro

Q1. How easy is the program to use? Be as specific as possible.

- It is easy to search for a films
- Nice clear images and good presentation
- Easy to scroll and add ratings

Q2. Are there any critical errors (i.e. crashes, non-loading etc.) if so, please state them in detail

- None found so far, the code seems to stand up to add 'null ' values for example

Q3. Are there any data errors in the program? (i.e. movies displayed incorrectly, recommended movies are unrelated etc.)

- Where the film data is incomplete it would be useful to return a 'library' image e.g. film poster unavailable'

Q4. Please name any improvements that need to be made in relation to how the program functions

- Sign in – could use a 'successful notification'
- Log out / menu controls could at the top of the page
- Search box could auto delete 'search for movies here' when you click the box
- Option to hide the password
- Based the user access on e.g. an email address which is of course already unique

Q5. Finally, any other things you may wish to add

This is a good tool and it would be useful then to see how it could recommend films based on complex searches such as example 'John Travolta' & 'a named film director'

Evaluation

Most of my Requirements have been successfully met, those that have not have had the foundations of them already placed meaning I could meet them with more time and resources.

The program is hosted on a website/ local host as stated, and it starts with the login page. The database enables more than one user to log in and it uses both a password and a username. The user cannot get past the login with a username with the wrong password, however due to the nature of parsing the username value through the URL of each page, a user can switch to another account by changing the value of user=somethinghere to any other username they want. This is a serious security issue that could be rectified with more time and research into website security, but that is not in the current scope of my project. The login page also contains a link too the signup page so users can create an account. The sign in page stores the new username and password in the Database, and therefore does not let users resign up with the sane username. Both the login and sign up page refuse incorrect parameters such as length and correctness, displaying the relevant prompts to the user.

Upon signing up it sends the user to the login page to log in and upon login in the user is sent to the home page. The home page correctly displays all the watched movies for the user, and they aare all clickable sending the user to the movie info page. The search bar correctly searches Movies, but genres, people and other queries are not yet implemented although it is possible and would take little time due to the easy use of the TMDb API. The Recommended Movies section is unfinished, The research for it has been done and the program can be easily added too to retrieve genres from the TMDb API into my own database, this would take a little time but can be completed without too much problem.

The search page displays all movies relevant to the criteria and are all clickable, There is a small error due to page refreshing that makes the user unable to search on the search page, which could also be very easily fixed. When a movie is clicked on it takes the user to the movie info page which displays all relevant data and gives the ability to watch and rate the movie. If the movie has not been rated it shows the value unrated. Watching a movie will add it to the movie database table as well as rating a movie will dd its values to the rated movie table.

Another thing to note is that the UserData database went through a few changes and streamlining as the solution was created. Movies table was completely removed as it would be faster, and easier for the program just to call the API again, making it store less unnecessary data.