MoviesEngine

1. Problem Statement

Nowadays, with the influx of movies, there are many different choices people have to make regarding cinema, time and seating. However, with the current system of doing this, consumers must traverse through many different cinema sites to find the ideal times, seats and prices that they want. This is an inconvenience to many moviegoers who simply just want to find the time that is most suitable for them. Taking a look at the current Hoyts website, customers are limited to just the times, seats and prices provided by Hoyts for a particular movie. However, with our new system, this problem would no longer exist since for a single movie you may view all the prices and times across all cinemas nationwide on one screen. We want to propose a system which allows the following:

- Writing reviews and giving ratings
- Reading reviews and seeing ratings
- Comparison of cinema prices
- Filter movies by genre
- Save movies on to a watch list
- Locations of the closest cinemas
- Search cinemas by clicking on a movie
- Adding movies to a watchlist
- Filter a movie by showtimes and available seating

2. User Stories

US1
Feature Filter cinemas by price
As a Consumer

So that I can find the ticket within my budget.
I want to Filter my cinema search result according to the price range of a cinema

GIVEN I am on MoviesEngine Homepage
WHEN I click on “filter cinemas”
THEN I should see a drop-down list
WHEN I click on “By Price” and select the max and min prices
AND I press the “search” button
THEN I should see all the cinemas selling tickets within my price range

US2
Feature Filter cinemas by time
As a Consumer

So that I can find all movies in all cinemas at the time that is most ideal for me.
I want to Filter my cinema search result according to my preferred time

GIVEN I am on MoviesEngine Homepage
WHEN I click on “filter cinemas”
THEN I should see a drop-down list
WHEN I click on “By Time” and select my preferred time
AND I press the “search” button
THEN I should see all the cinemas selling tickets for movies at my selected time

US3
Feature Filter all cinemas by location
As a Consumer

So that I can find the closest cinema to me.
I want to Enter any address and able to find cinemas near that address

GIVEN I am on the Find Cinema Page
WHEN I type in my address and click search
THEN I should see all the cinemas near my selected location

US4
Feature Find available seating
As a Consumer

So that I can sit in the best possible spot
I want to Be able to book a seat after I have chosen a movie and a cinema

GIVEN I am on the MoviesEngine homepage
WHEN I click on seating
THEN I should be redirected to the seating map of the original cinema showing all taken and not taken seats.
WHEN I click on a seat
THEN I should be able to book the seat

US5
Feature Rate and review movies
As a Consumer

So that I can help others to select movies to watch
I want to Rate and review movies

WHEN I click on the “Write a review button” on the movie page
THEN I should be able to write a review and give a rating
WHEN I press submit
THEN my review should be permanently saved on to the page

US6
Feature Find all cinemas showing a movie
As a Consumer

So that I can find the cinemas showing the movie I want to watch.
I want to Search for all cinemas showing the movie I want to watch

GIVEN I am on Movie page
WHEN I click on “Search”
THEN I should see all the cinemas showing the movie I want to watch

US7
Feature Read reviews and see ratings
As a Consumer

So that I can make informed decisions about seeing a movie
I want to Read reviews and see ratings of a movie

GIVEN I am on a Movie page
WHEN I click on reviews
THEN the average rating and reviews from others should be displayed
AND reviews can be read sorted by sorting preference

US8
Feature Upvote reviews
As a Consumer

So that I can help other users know the credibility of a review

I want to Upvote reviews that I find useful

GIVEN I am on a Movie page
WHEN I click on a review
THEN I should be able to upvote the review

US9
Feature Filter all movies by genre
As a Consumer

So that I can find the movies which appeal to my interests.
I want to See movies of my selected genre

GIVEN I am on MoviesEngine Homepage
WHEN I click on any genre
THEN I should see all movies for the selected genre

US10
Feature Add movies to watchlist
As a Consumer

So that I remember which movies I would like to watch.
I want to Add movies to my own watchlist

GIVEN I am on MoviesEngine Homepage and logged in as a user
WHEN I click on “Add to watchlist” button of any movie
THEN I should be taken back to my watchlist with the selected movie added to my list

US11
Feature View all movies in Watchlist
As a Consumer

So that I can find which movies I added to my watchlist.
I want to View all movies I added to my watchlist

GIVEN I am on MoviesEngine Homepage and logged in as a user
WHEN I click on “My Watchlist”
THEN I should see all the movies I added to my watchlist

US12
Feature Search for a movie
As a Consumer

So that I can save time finding a movie
I want to Search for a movie

GIVEN I am on MoviesEngine Homepage and enter the name of a movie to the search bar
THEN I should see the movie's information and which cinema is playing the movie

US13
Feature Compare prices on different days
As a Consumer

So that I can find the cheapest ticket possible
I want to See ticket prices at different cinemas on different days

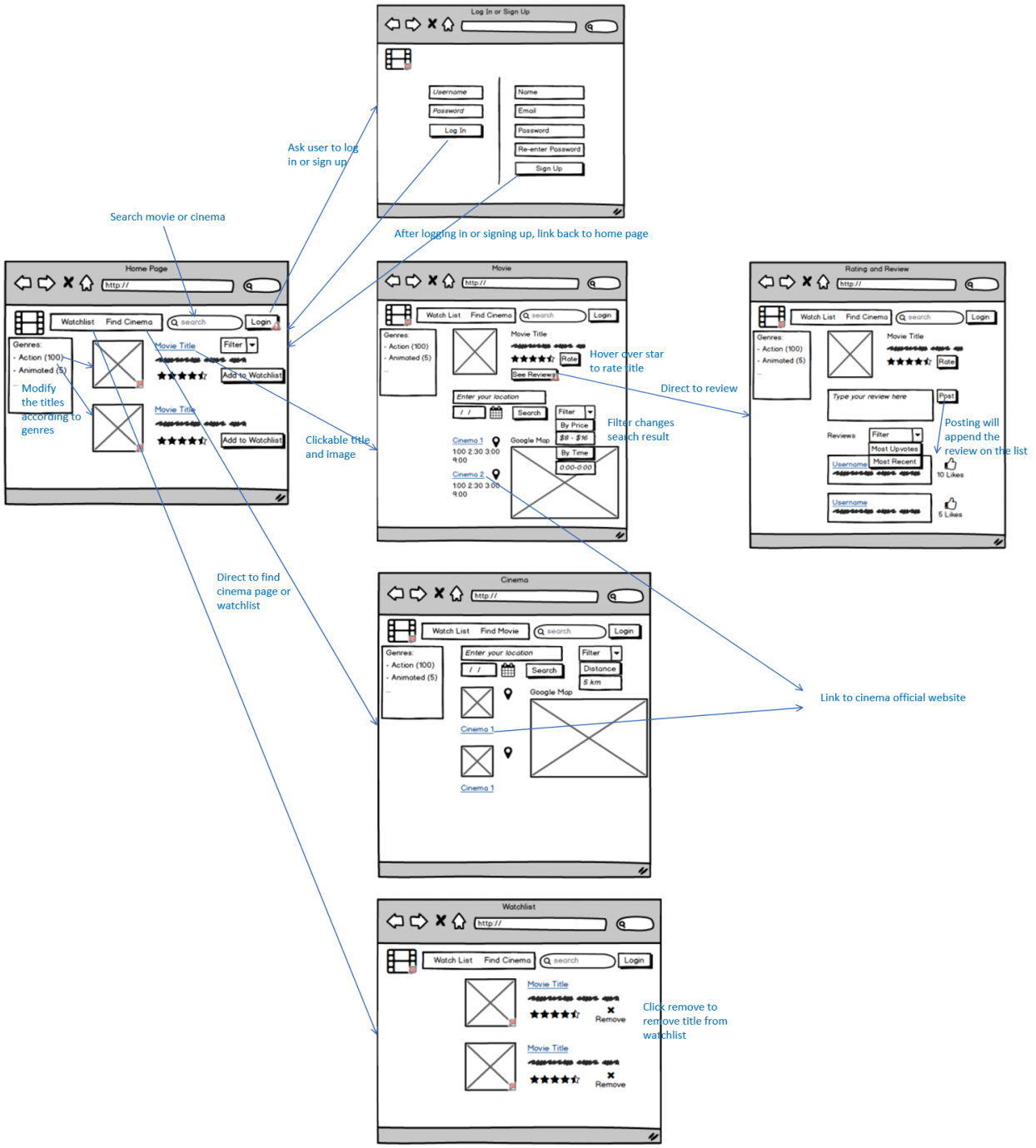
GIVEN I am on a Movie page
THEN I should see the ticket prices at different cinemas on different days

US14
Feature See upcoming movies
As a Consumer

So that I can get an early ticket
I want to See all upcoming movies

GIVEN I am on a MoviesEngine Homepage and filter by 'Coming Soon'
THEN I should see a list of upcoming movies

3. Low-Fidelity Prototype

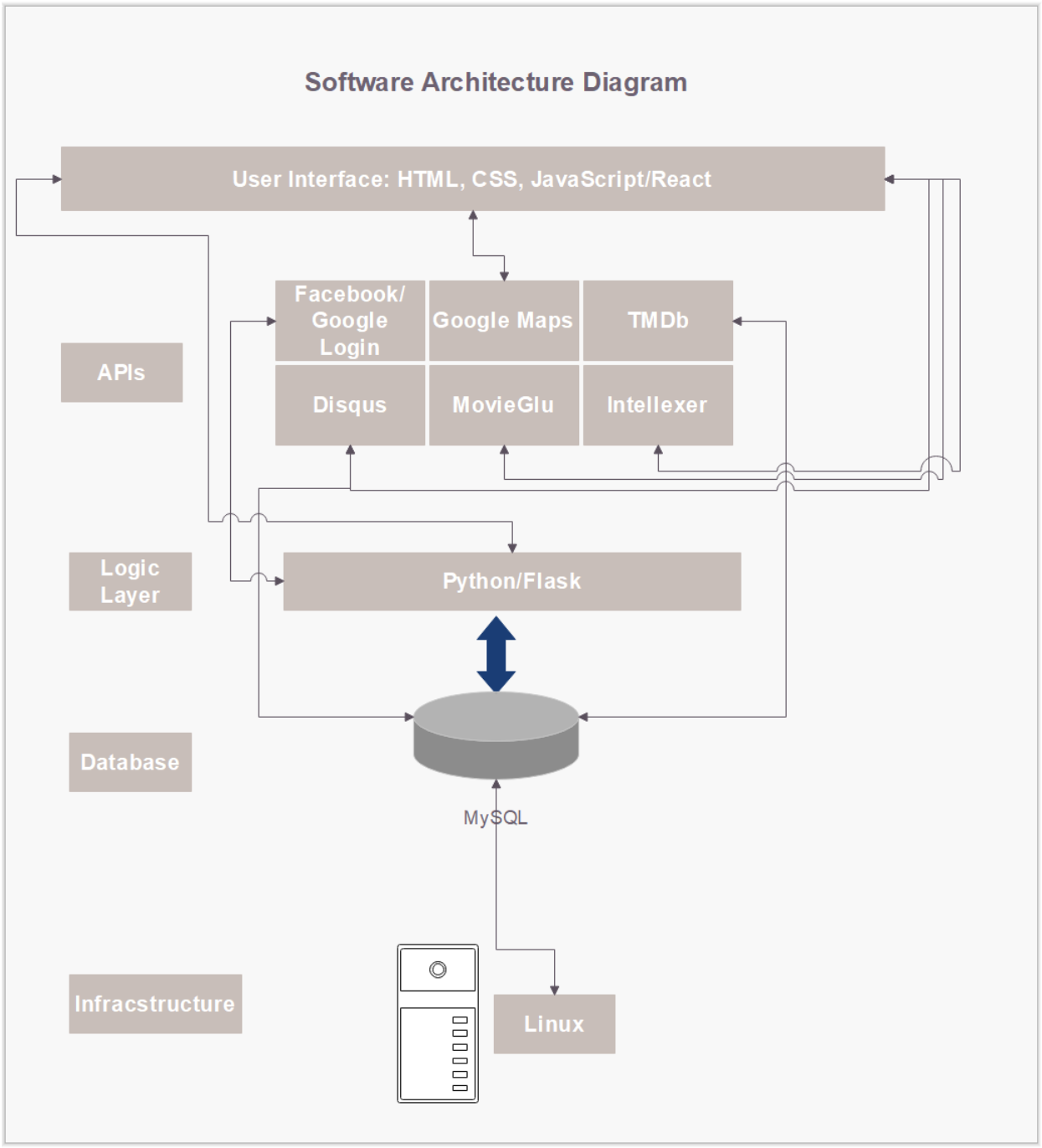


4. High-Fidelity Prototype

https://focd2s.axshare.com

5. Software Architecture

5.0. Software Architecture Diagram



Our software Architecture consists of 5 layers namely, the infrastructure layer, the database layer, the logic layer, API layer and finally the user interface layer. Each layer serves its own purpose and role in the application.

The infrastructure layer shows the server platform that will run the software, it is basically the operating system that our system will be run on whether it is Windows, Linux, mac os or similar.

The database layer shows the different databases our application will access to generate its information the most important database being the cinema databases.

The logic layer is the processing layer of the application and is made up of mainly Python it's

can be thought of as the main function of the software application. It can fetch data from the database through a connector.
The API layer shows a list of APIs that our application will use, in this case, Google maps, Facebook/Gmail login, MoviesGlu etc.
Finally, the user interface layer is the layer which the user can see and interact with. It consists of several elements including HTML, CSS and JavaScript. It is how the program looks in essence.

5.1. Infrastructure

The system we are building is deployable on popular operating systems such as Windows, Linux or MacOS.

5.2. Database

MySQL is chosen as our database management system for various reasons. Firstly, it is a free system, hence minimising cost of the app. Secondly, some of the members in our team are inexperienced with database. Since MySQL is a popular language with plenty of resources available, it eases the learning experience of the development team. It is also easy to connect with Python using built-connector.

5.3. Logic

Our team uses Python and Flask framework for the logic tier since all members have past experience with Python/Flask. In addition, Python has clean syntax, a large number of libraries, while supporting object-oriented design. All of these factors can increase the team productivity level drastically.

5.4. External Data Source (APIs)

To minimise development time while maintaining a high-quality web application, we incorporate various APIs in different functions of our app.
For logging on, on top of creating an account on our server, we also allow users to log in via Facebook or Google account.
To access a large database of movies, and perform actions such as searching, displaying popular movies, we use The Movie Db API. In addition, the app will have text prediction when a user types in the search bar. Intellexer API is used to serve this purpose.
Meanwhile, MovieGlu API provides a solution for searching for which cinemas are showing a chosen movie. Furthermore, Google Maps API will show the location of the cinemas on the map so users can easily locate the cinema.
Each movie has reviews on them. We use Disqus API to manage the review threads.
Most information obtained by the APIs is sent to the backend via JSON and be processed there.

5.5. User Interface

The basic user interface comprises of HTML and CSS. The combination provides information in an aesthetic way.
We also use Javascript-React framework to make to the web page more interactive and make navigation through the web page more trivial. It is also used to fetch data from and send data to the backend of our system.

5.6. Supported Platforms and Requirements

To provide maximal utility to consumers the system should support a wide range of platforms. For this reason, we have chosen to implement a web-based application. By doing so, the system is accessible to users on any platform with a standards-compliant web-browser.

Supported platforms include, but are not limited to, the following:

- Windows
- Linux
- MacOS
- Android

Supported, standards-compliant web-browsers are:

- Microsoft Edge
- Google Chrome
- Mozilla Firefox
- Safari
- Opera

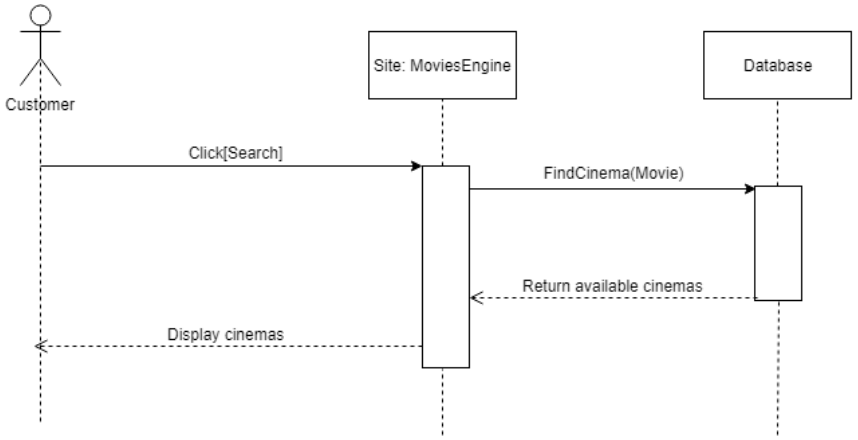
5.7. Benefits of Chosen Architecture

The chosen architecture provides an efficient development experience, allowing the application to be created in a short period of time, as well as ensuring a high-quality system which is accessible by a large consumer audience.

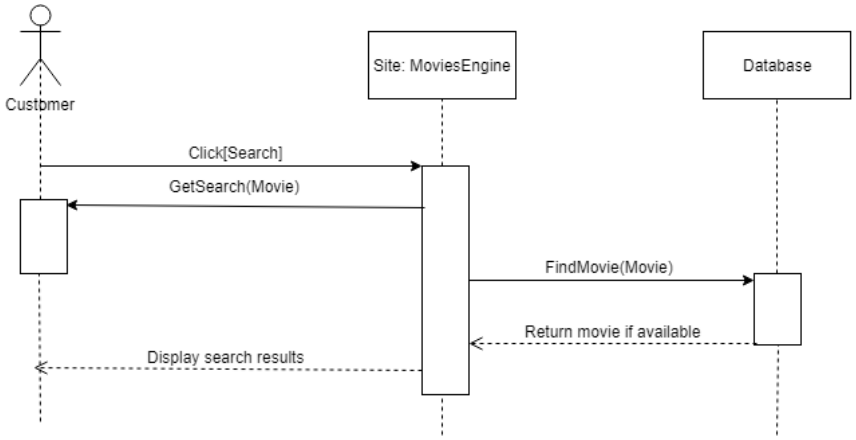
The use of existing APIs enables the quick creation of a minimal, viable product (MVP). This allows consumers to use the system as soon as possible which in turn allows for the collection of user feedback. By collecting user feedback bugs can be found and fixed earlier, feature suggestions can be obtained, and further development can be focussed on user satisfaction.

By creating a web-based application, the system is able to be accessed by as large of a consumer-base as possible. Any consumer with access to a web-browser is able to access the system, minimising platform-specific development overhead and maximising the accessibility of the system.

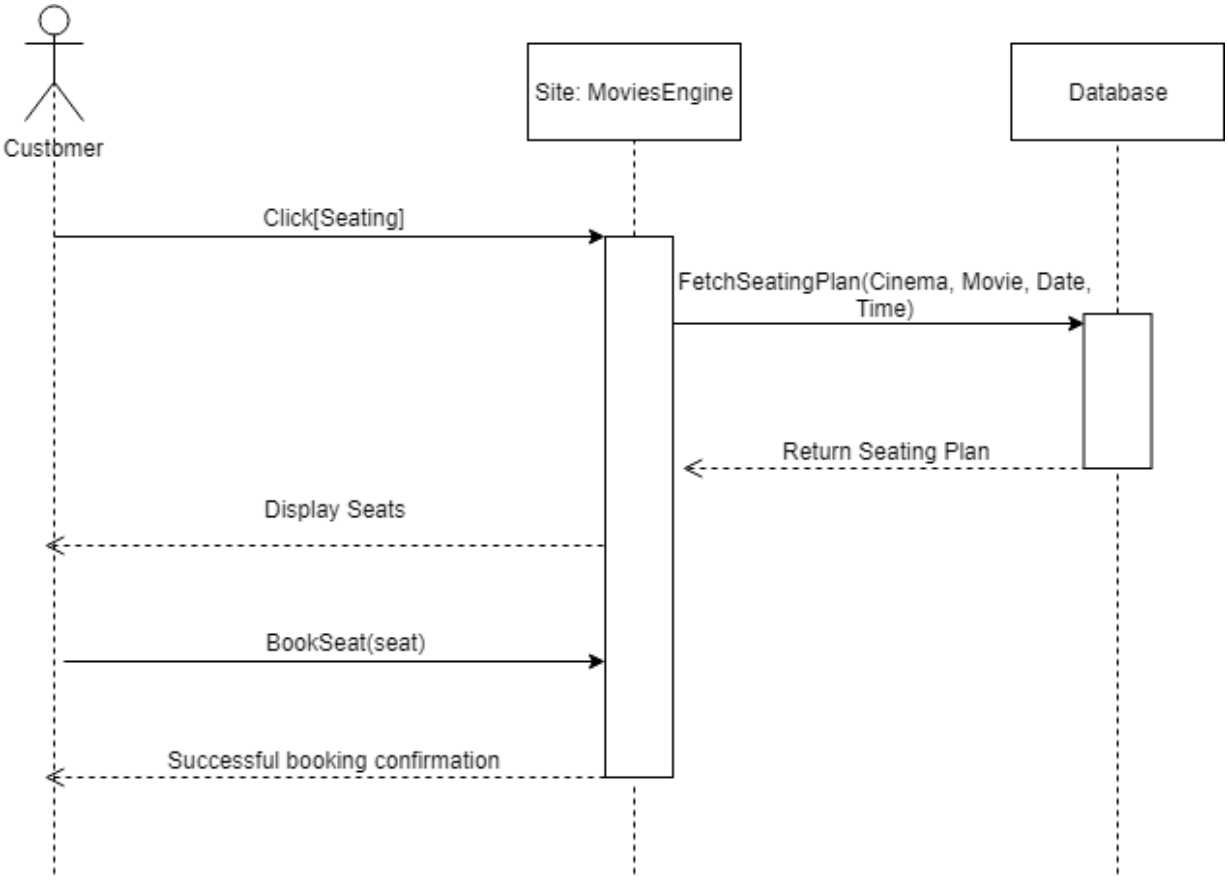
6. Sequence Diagrams



Find all cinemas showing a movie

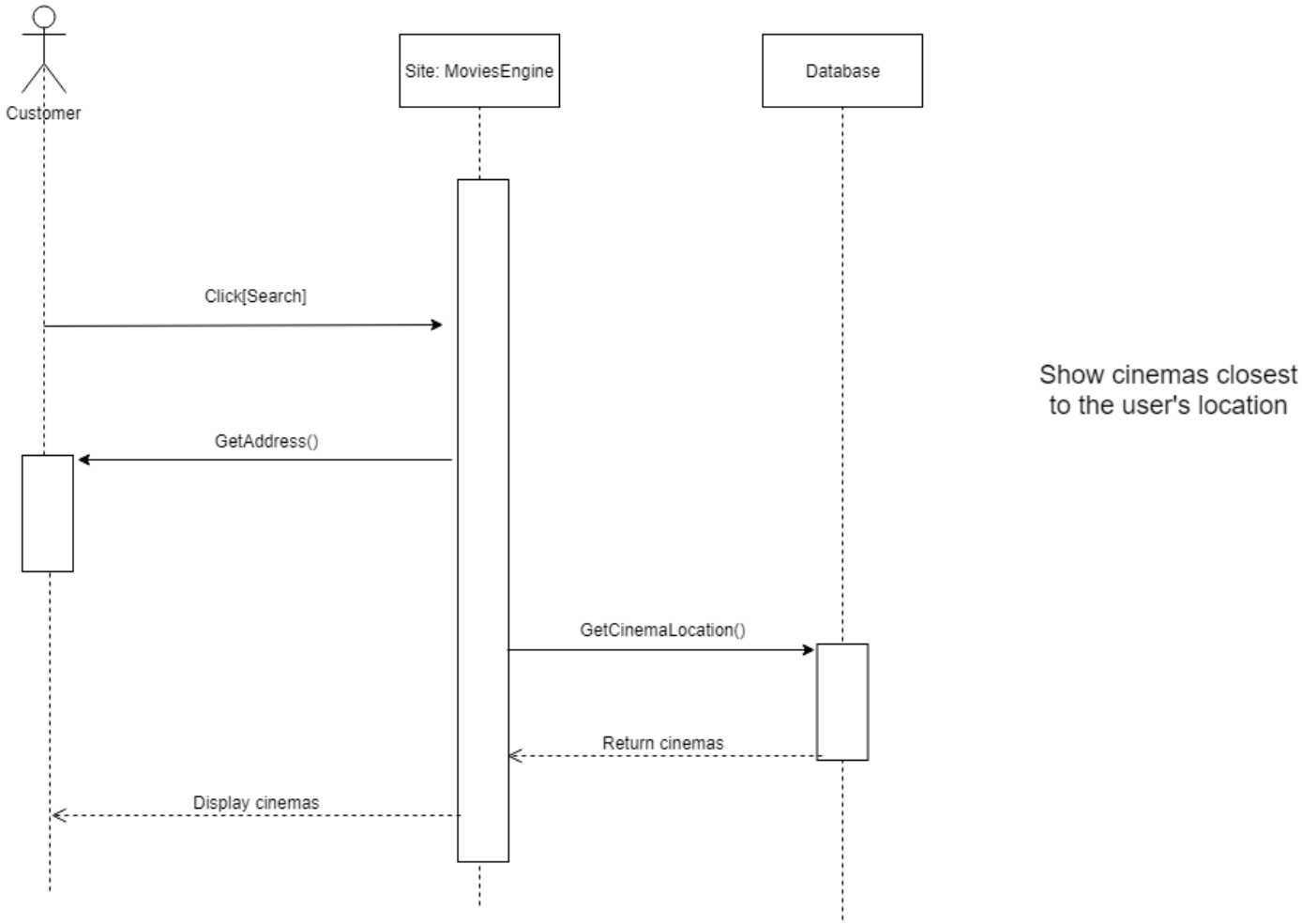


Search for a movie

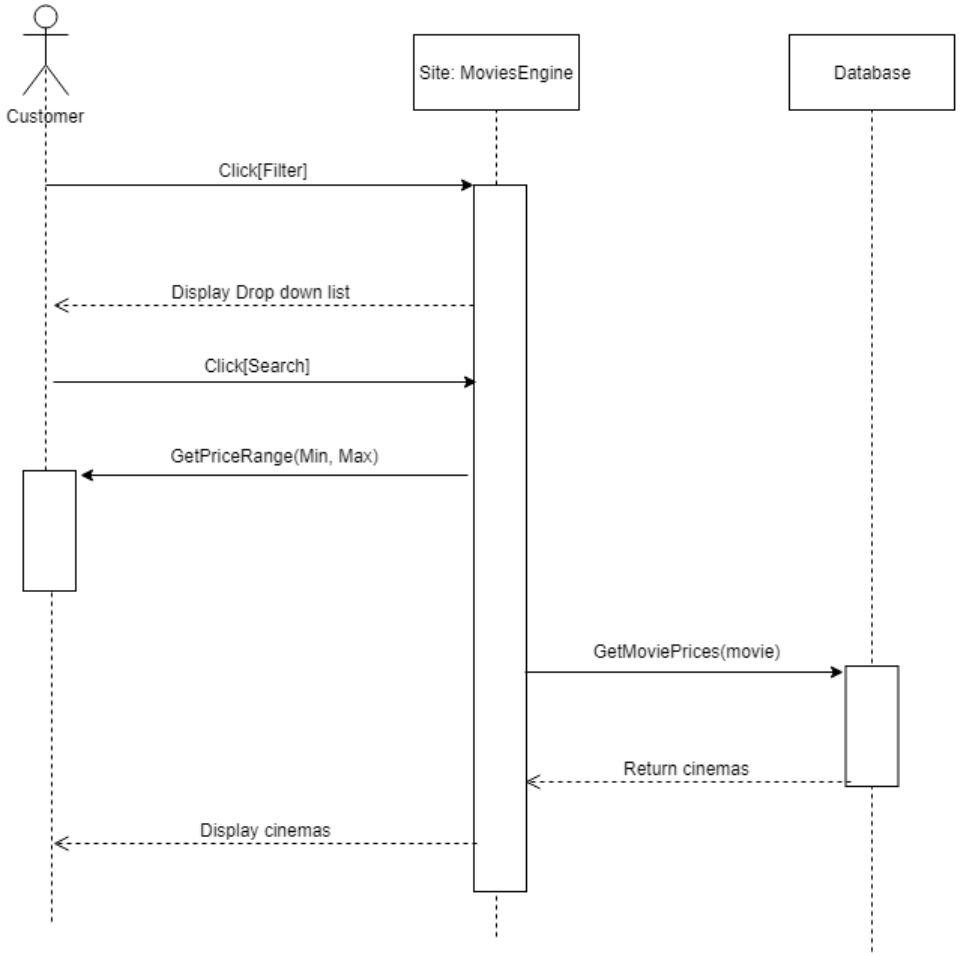


Booking a seat at a cinema

This diagram shows the process of booking a seat when the user has chosen a movie and has decided to buy a ticket.

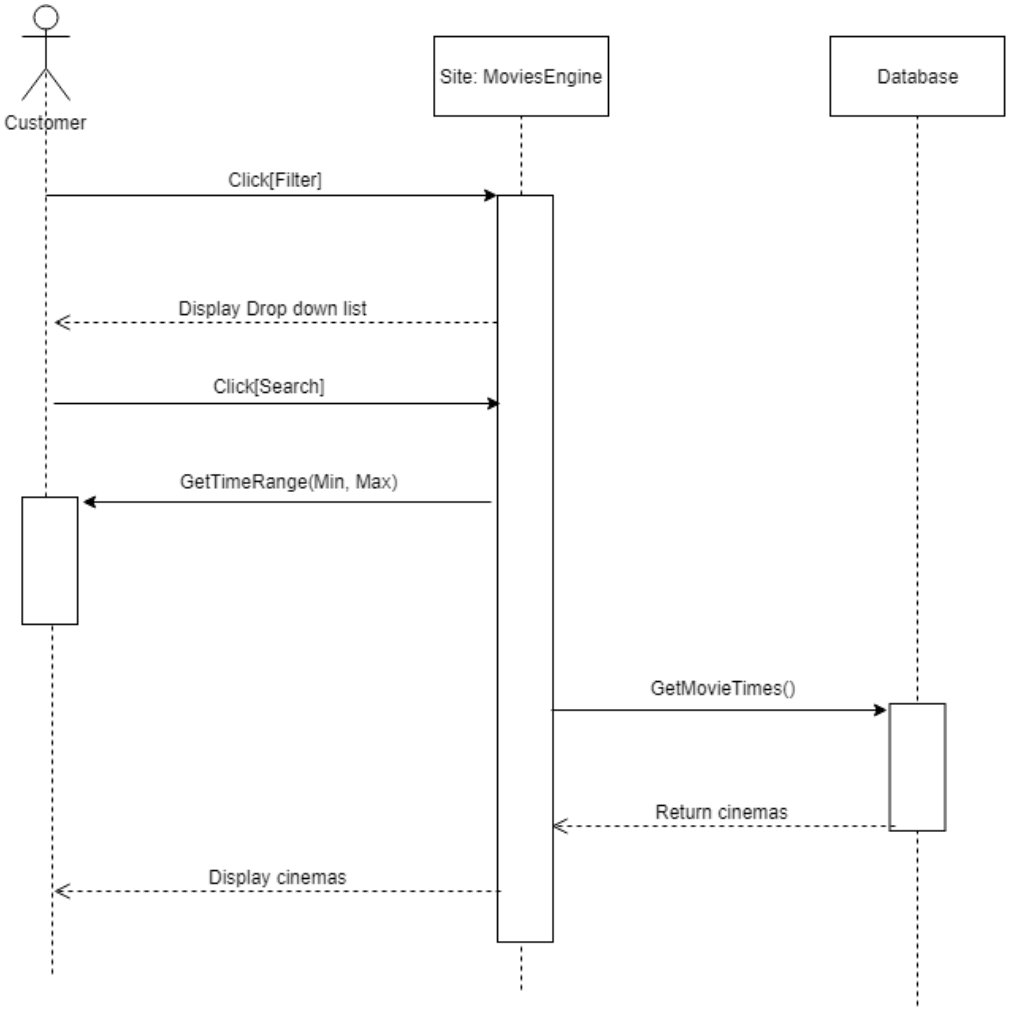


This diagram shows how the user selects a cinema by searching based on their current address.



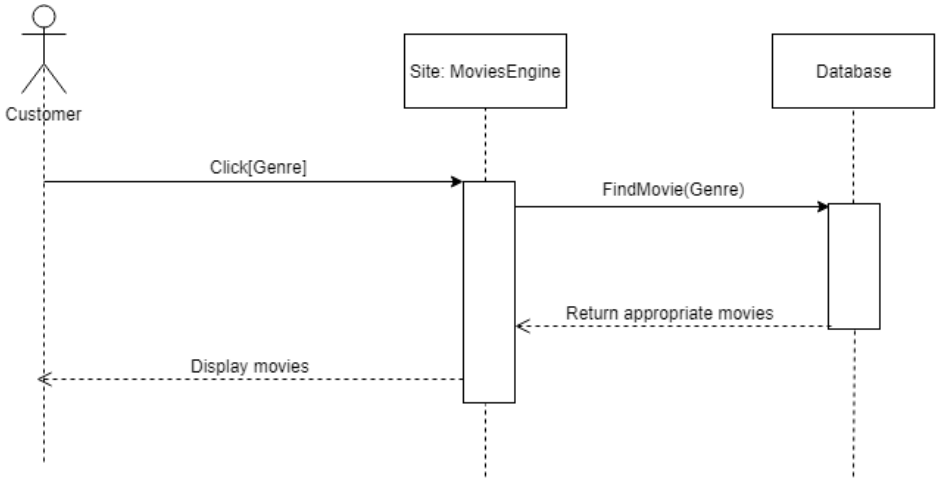
Search cinema by price

This diagram shows the process of finding a cinema by filtering with a minimum and maximum price on tickets.



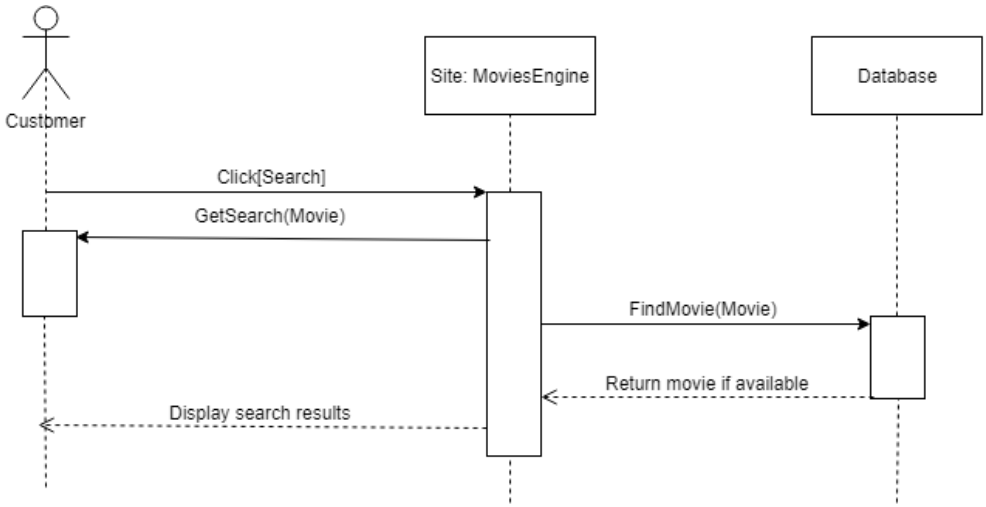
Search cinema and movie by time

This diagram shows the process of searching for a movie in a cinema based on the time it will be showing.



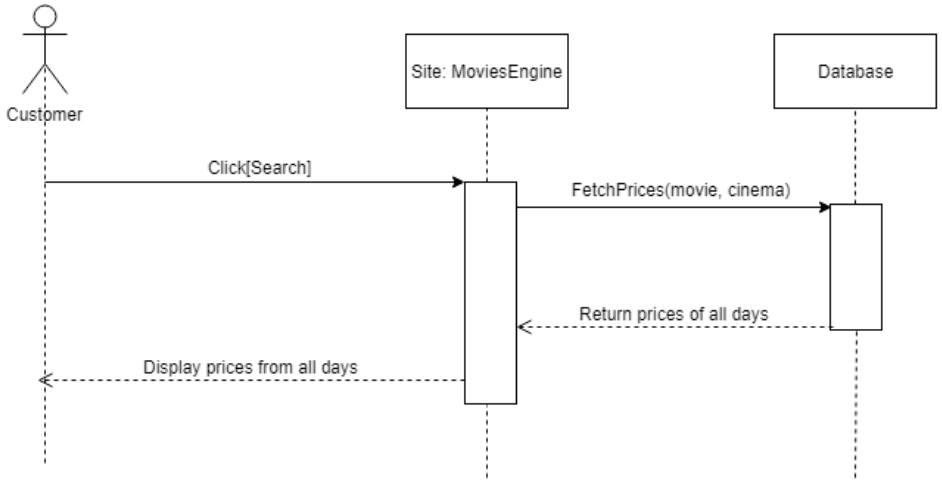
Search movies via genre

This diagram shows the process of filtering movies with a specific genre.



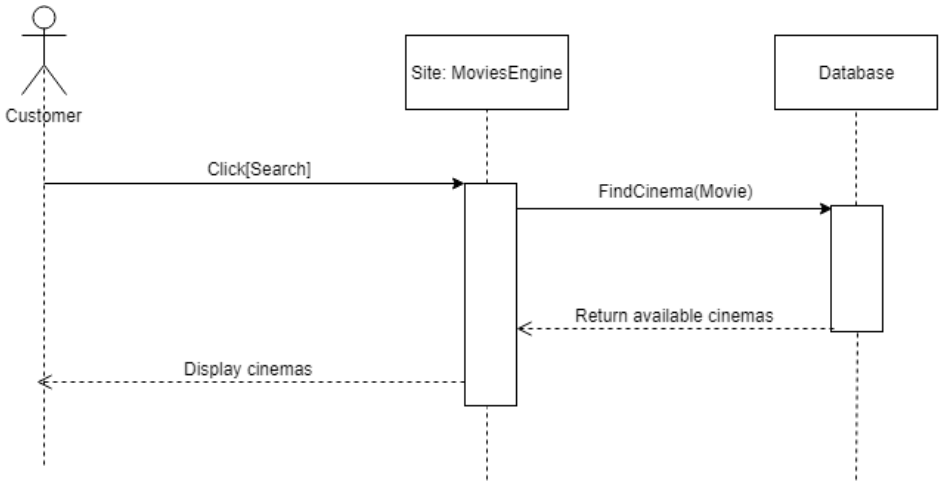
Search for a movie

This diagram shows how the user will search for a specific movie on the site.



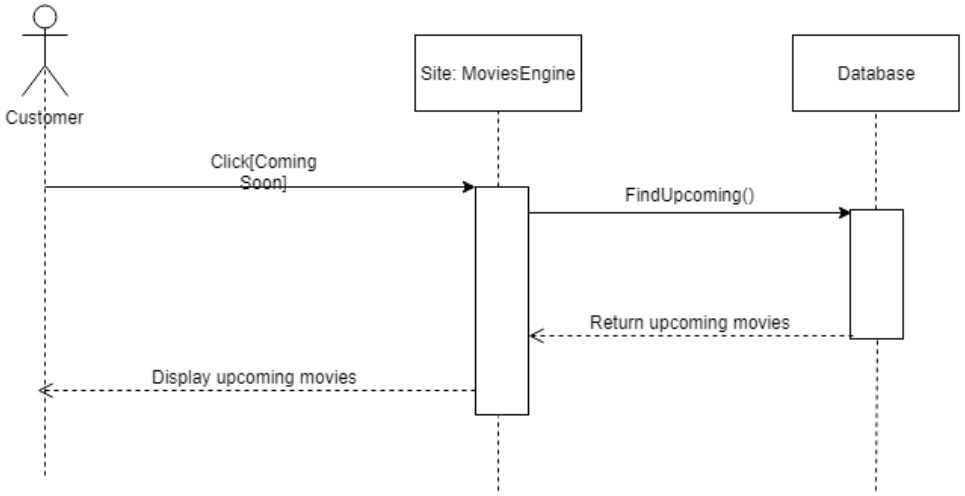
Check prices of movie tickets on different days

This diagram shows the process of checking the prices of movie tickets on different days.



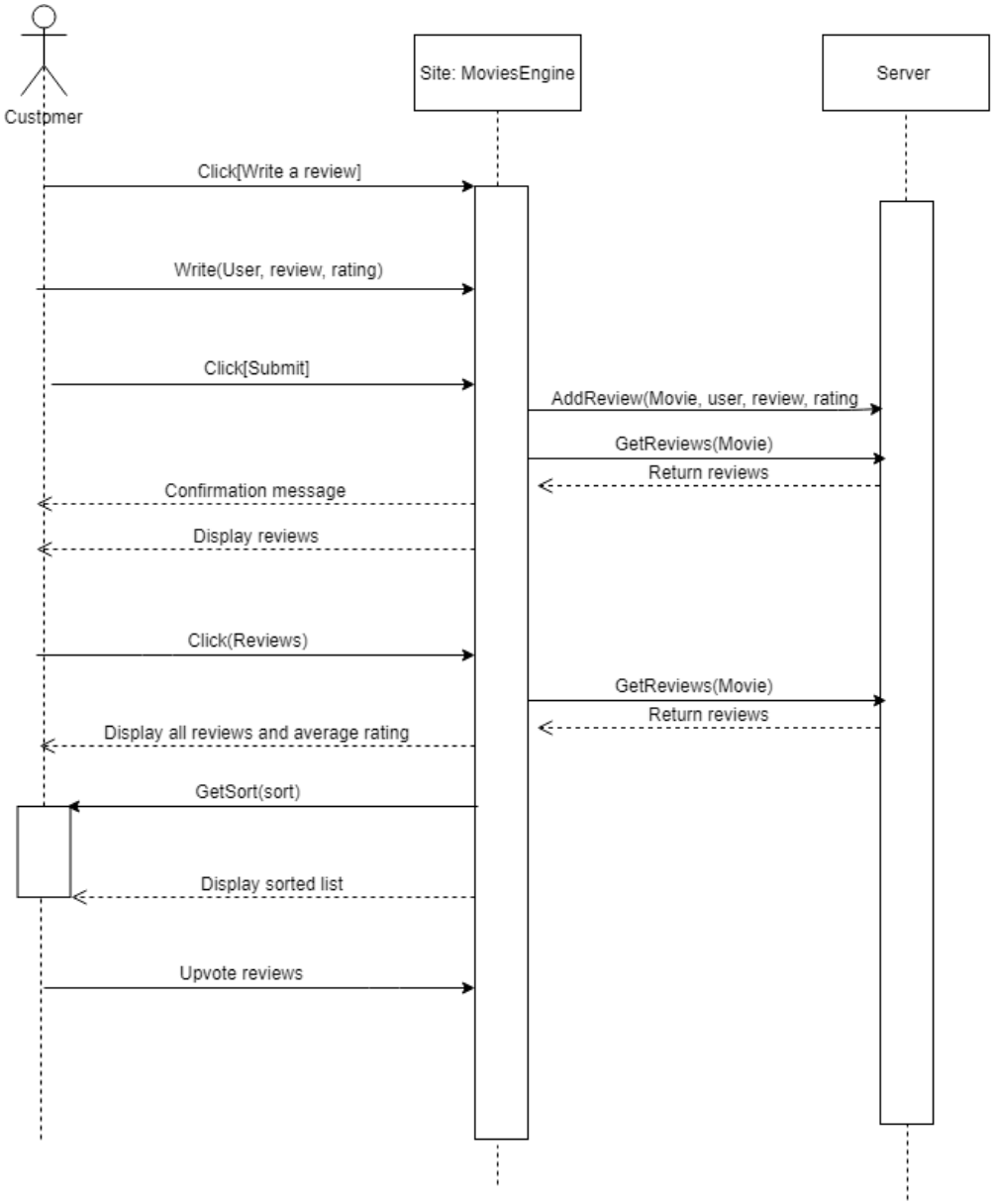
Find all cinemas showing a movie

This diagram shows the process of searching through different cinemas showing a specific movie.



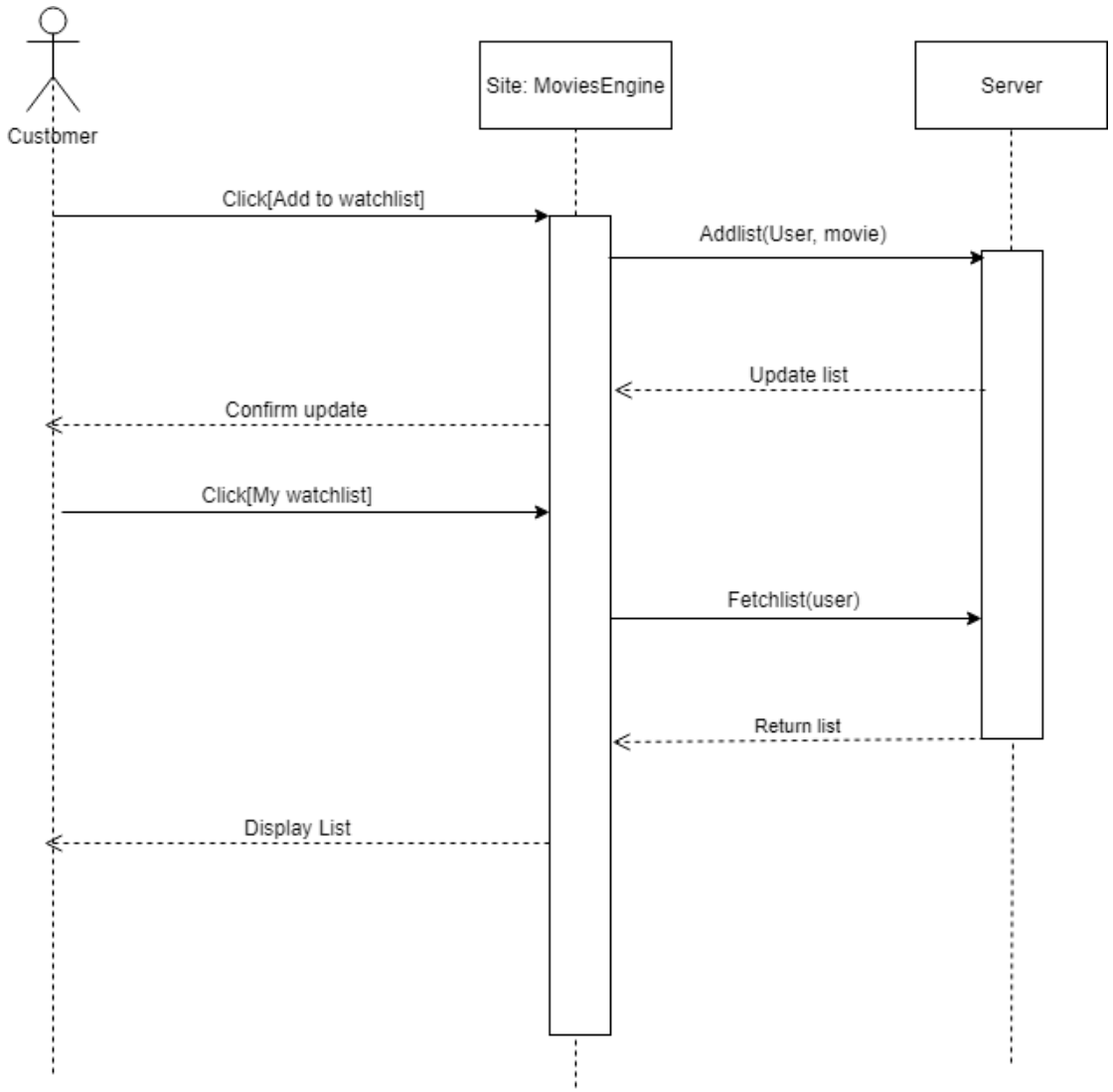
See all movies that are coming soon

This diagram shows the process of finding upcoming movies.



Add a review to a movie, rate a movie, see reviews and upvote reviews

This diagram shows the process of how a user writes a review, upvotes a movie, see others reviews and the average rating.



Add movies to a watch list and see a user's watch list

This diagram shows how the user is able to add a movie into their watchlist and how they are then able to see their watchlist.