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Title: Movie Recommendation System

Project Summary:
Movie Recommendation System is a web application that will recommend movies to its users by analysing their genre preferences and watch patterns. The application provides an interface through which the users can login into the system, update their basic profile, the application will ask them certain questions and build the user's profile. The application will also perform analysis on the user's movie watching patterns and the ratings they gave to them to recommend movies according to the his/her taste.

Project Requirements:

| User Requirements				
ID	**Requirement**	**Topic Area**	**Actor**	**Priority**
UR-01	As a customer, I should be able to sign up	Authentication	Customer	Critical
UR-02	As a customer, I should be able to log into the system	Authentication	Customer	Critical
UR-03	As an admin, I should be able to log into the system	Authentication	Admin	Critical
UR-04	As an admin, I should be able to add new movie details into the database	Movie	Admin	Critical
UR-05	As an admin, I should be able to update an existing movie details	Movie	Admin	High
UR-06	As an admin, I should be able to add new customers into the database	Profile Management	Admin	High
UR-07	As an admin, I should be able to modify the details of an existing customer	Profile Management	Admin	High
UR-09	As a customer, I should be able to view my profile	Profile Management	Customer	High
UR-10	As a customer, I should be able to delete my account	Profile Management	Customer	Critical
UR-11	As a customer, I should be able to add my movie preferences	Movie	Customer	Critical
UR-12	As a customer, I should be able to add	Movie	Customer	Medium

	movies to my list of watched movies			
UR-13	As a customer, I should be able to delete movies from my list of watched movies	Movie	Customer	Low
UR-14	As a customer, I should be able to provide rating to the movies he has watched	Movie	Customer	Low
UR-15	As a customer, I should be able to view the list of movies	Movie	Customer	Medium
UR-16	As a customer, I should be able to sort the movie list according to different attributes like release year, votes, IMDB rating	Movie	Customer	High
UR-17	As a customer, I should be able to filter the movie list according to different attributes like language, genre	Movie	Customer	High
UR-19	As a customer, I should be able to view the movie recommendations	Movie	Customer	Critical
UR-20	As a customer, I should be able to change my subscription to a premium customer	Profile Management	Customer	Low
UR-21	As a customer, I want to download the list of recommended movies as a excel file	Movie	Customer	Medium
UR-22	As a customer, I want to choose my payment options to become a premium customer	Payment	Customer	Low

Business Requirements				
ID	**Requirements**	**Topic Area**	**Actor**	**Priority**
BR-01	A username must be their email id they use to sign up with	Authentication	All	Critical
BR-02	A password must contain at least 6 characters	Authentication	All	Critical
BR-03	A password must contain at least one digit and special characters are not allowed	Authentication	All	Critical
BR-04	Monthly bills need to be added to customer payments profile	Payment	Premium Customer	Medium
BR-05	Notify customers when their payment plan is about to expire	Payment	Premium Customer	Low

Non-Functional Requirements				
ID	**Requirements**	**Topic Area**	**Actor**	**Priority**
NFR-01	The customer should input his movie preferences for the recommendation system to recommend him movies	Design	Customer	Critical
NFR-02	Interface should be user friendly	Design		High
NFR-03	Must support concurrent logins	Design		High

Data Storage	
Database: MySQL	
Table Name	**Description**
UserInfo	Stores admin and customers details (firstname, lastname, username, password, phoneNumber, usertype, subscriptionPlan)
Movie	Stores movie details (movieId, movieName, genre, votes, rating, year, language, plotLength)
MoviePreferences	Stores customers movie preferences (genres, languages, years, watchlist, recommendationList)
Payment	Stores customer's payment details

Use Cases
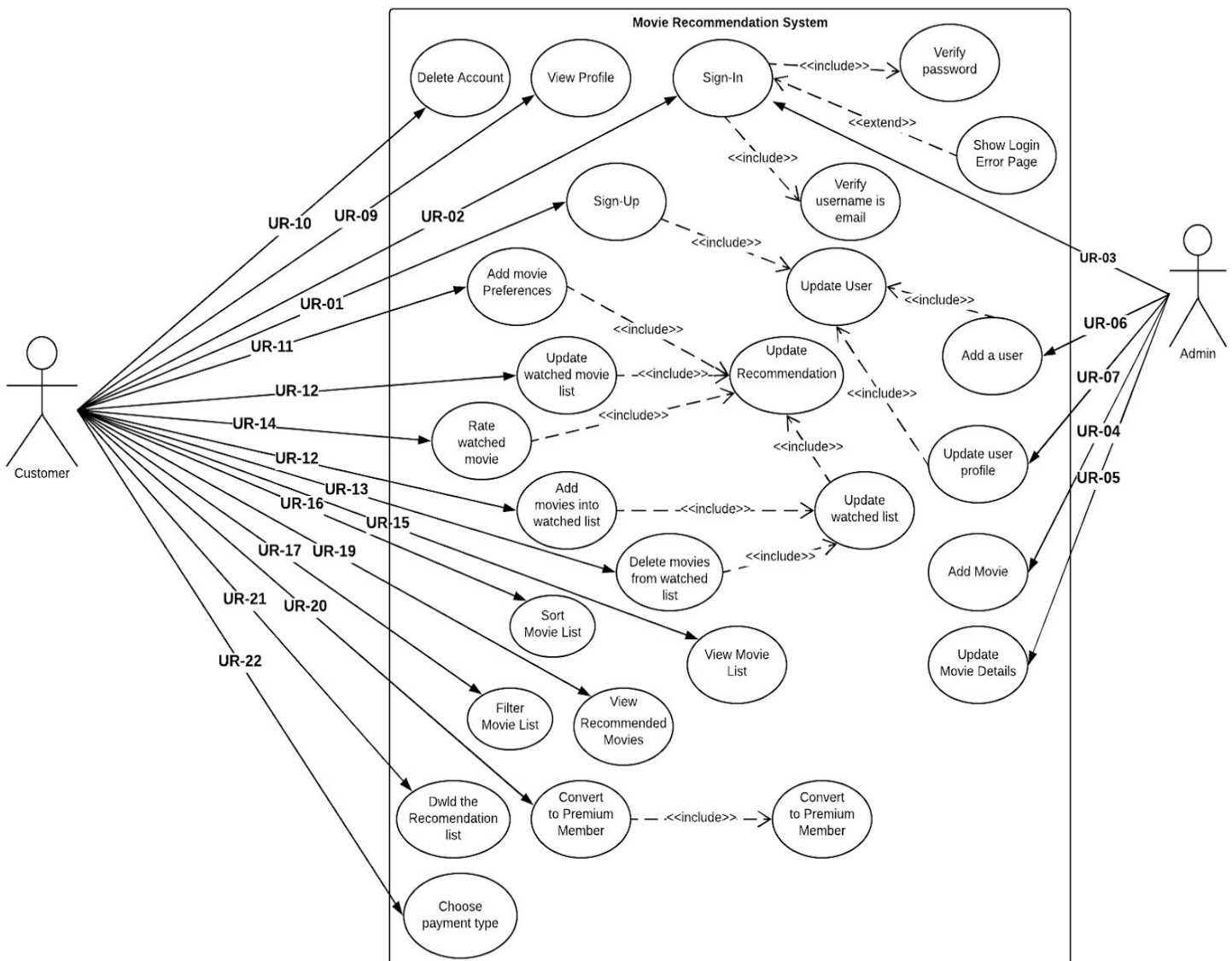
Note: A more clearer version of the above diagram is again included as a separate PDF on github.

Use Case Document

Two major tasks are:

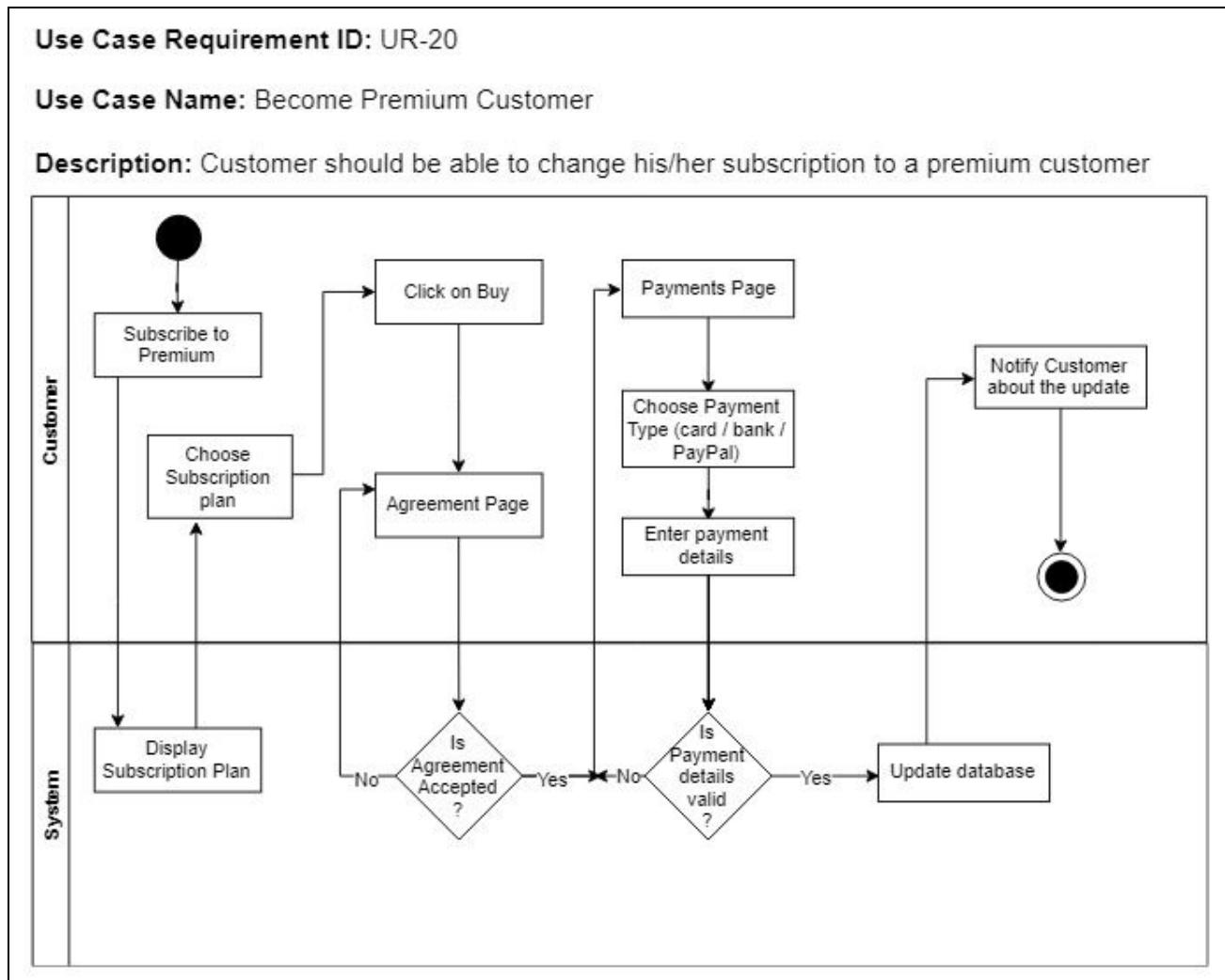| Use Case ID	UR-20
Use Case Name	Become Premium Customer
Description	Customer should be able to change his/her subscription to a premium customer.
Actors	Customer

Pre conditions	Customer must have an existing account	
Post conditions	Customer can enjoy premium privileges	
Frequency of use	Moderate	
Flow of Events	Customer	System
	1. Customer clicks on Subscribe to Premium	Display the different Subscription Plans
	2. Choose subscription plan and Click on "Buy"	Display Agreement Page
	3. Click on agree	Show Payment Page
	4. Choose Payment option and fill details	Validate Payment details and update the database
Variations		
Exceptions	Invalid Payment details	
Developer Notes		

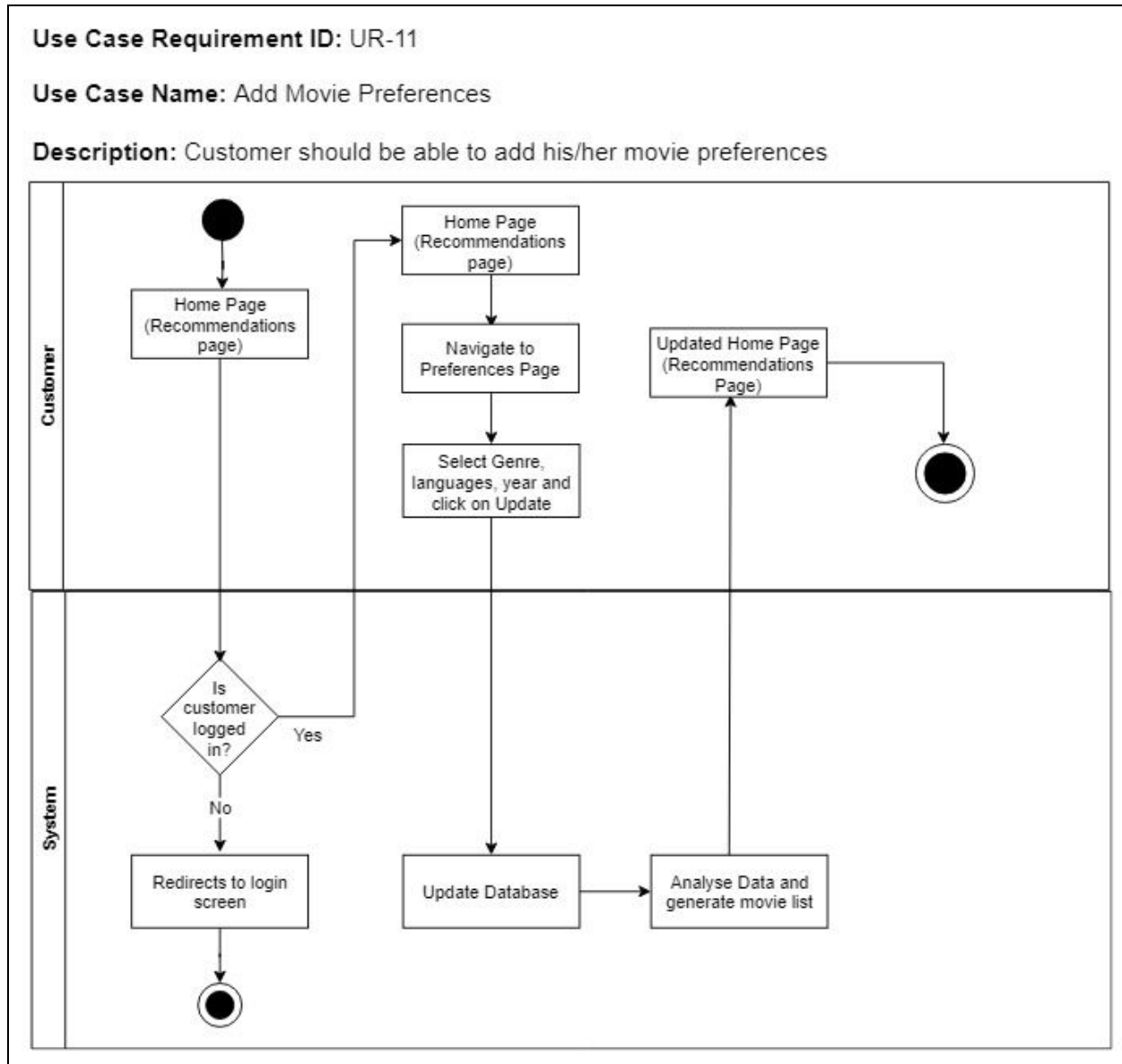| Use Case ID	UR-11	
Use Case Name	Add Movie Preferences	
Description	Customer should be able to add his/her movie preferences.	
Actors	Customer	
Pre conditions	Customer must have an existing account	
Post conditions	Customer can enjoy specially curated Recommended Movie list	
Frequency of use	High	
Flow of Events	Customer	System

	1.	Customer clicks on add movie preferences button	Display the movie preferences page
	2.	Customer chooses his preferences such as genre, languages, movie release years and clicks on "Update" button	Update the preferences in database and analyse the data and generate a recommendation movie list and display this to user on his home page
	3.	Customer is redirected to homepage where he can view his movie recommendations list	
Variations	If the customer is a new user, his home page will be a blank page with a button "Update movie preferences" that takes him to the page where he can update his movie preferences		
Exceptions	Customer not logged in		
Developer Notes			

Activity Diagram

Activity Diagram 1 showing how a normal customer can change his subscription plan to become a premium customer

Use Case Requirement ID: UR-20

Use Case Name: Become Premium Customer

Description: Customer should be able to change his/her subscription to a premium customer

Activity Diagram 2 showing how a customer can add his movie preferences and get a system generated movie recommendation list.

Use Case Requirement ID: UR-11

Use Case Name: Add Movie Preferences

Description: Customer should be able to add his/her movie preferences

UI Mockups

1. Home page / Main page of the application that allows the user to click on login or sign up button

2. Login page that allows the admin/customers to login

3. New customer sign up page that allows new customers to sign up for a free account

MOVIE RECOMMENDATION SYSTEM

SIGN UP

First Name   Last Name

Email ID

Password

Confirm Password

Phone Number

SIGN UP

4. Movie Preferences Page: Every new customer will be brought to this page after first time login

MOVIE RECOMMENDATION SYSTEM

WHAT'S YOUR MOVIE PREFERENCES ? (Select all that apply)

Comedy | Drama | Romantic | Action | Thriller | Mystery | Crime | Sci-Fi | Horror

Western | Animation | Adventure | Musical | War | Historical | Documentary | Suspense | Fantasy

WHAT LANGUAGE MOVIES DO YOU LIKE ?

☑ Arabic ☐ French ☐ Italian ☐ Nepali ☐ Spanish ☐ Thai
☐ Chinese ☐ German ☐ Japanese ☐ Polish ☐ Swedish ☐ Tibetan
☐ Dutch ☐ Greek ☐ Kannada ☐ Portuguese ☐ Tamil ☐ Turkish
☐ English ☐ Hindi ☐ Korean ☐ Russian ☐ Telugu ☐ Urdu

DO YOU LIKE NEW/OLD MOVIES ? (Choose the decades)

☐ Current ☐ 1990s ☐ 1970s ☐ 1950s ☐ 1930s
☐ 2000s ☐ 1980s ☐ 1960s ☐ 1940s ☐ 1920s

SUBMIT

5. Browse Movies Page: Customer can click on the Browse tab to get a list of movies and mark a movie as watched

MOVIE RECOMMENDATION SYSTEM — Hello! Vipra Gupta

| Browse | View Recommendations | Update Preference Profile | Manage Account | Log Out |

LIST OF MOVIES

MOVIE ID ▼	MOVIE NAME ▼	MOVIE PLOT	GENRE	YEAR ▼	VOTES ▼	RATING ▼	LANGUAGE ▼	Watched?
ttom4218	Panic	Alex, a sad eyed	Comedy	2000	2163	58	English	☑
. . .	. . .	. . .	. .	. .	. .	. .	. .	☑
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
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. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐
. . .	. . .	. . .	. .	. .	. .	. .	. .	☐

6. View Recommendations Page: Customer can click on the View Recommendations tab to get a list of movie recommended for the user based on his preferences list

MOVIE RECOMMENDATION SYSTEM — Hello! Vipra Gupta

| Browse | View Recommendations | Update Preference Profile | Manage Account | Log Out |

YOUR RECOMMENDATION LIST

BEAUTY AND THE BEAST
Movie Plot : . . . . .
Genre : Animation
Year : 2015
Number of Votes : 2147
Rating : 81
Language : English

FROZEN
Movie Plot : . . . . .
Genre : Animation
Year : 2012
Number of Votes : 3349
Rating : 85
Language : English

Tangled
Movie Plot : . . . . .
Genre : Animation
Year : 2010
Number of Votes : 2157
Rating : 80
Language : English

Download as csv file

7. Manage Account page: He can click on the Manage Accounts tab to change his Name, Password, Subscription plan etc.

MOVIE RECOMMENDATION SYSTEM   Hello! Vipra Gupta

| Browse | View Recommendations | Update Preference Profile | Manage Account | Log Out |

MANAGE ACCOUNTS

First Name : Vipra   (Edit Profile)

Last Name : Gupta

Email ID : vipra.gupta@colorado.edu   (Update to Premium)

Password : ✗✗✗✗✗✗✗   (Update Payment)

Phone No : 720-555-892

Plan : Free Usage

Payment Type : None

8. Update to Premium page: He can click on the Update to Premium button on the Manage Accounts page to purchase a subscription plan

MOVIE RECOMMENDATION SYSTEM   Hello! Vipra Gupta

| Browse | View Recommendations | Update Preference Profile | Manage Account | Log Out |

MANAGE ACCOUNTS : UPDATE TO PREMIUM

Unlimited Movie Recommendations

1 MONTH PACK	3 MONTHS PACK	6 MONTHS PACK	12 MONTHS PACK
$9.99	$25.99	$48.99	$94.99
(Buy)	(Buy)	(Buy)	(Buy)

Sequence Diagram

Note: A clearer version of both the diagram can be found as a separate file in git.

Use Case ID	UR-20
Use Case Name	Become Premium Customer
Description	Customer should be able to change his/her subscription to a premium customer.
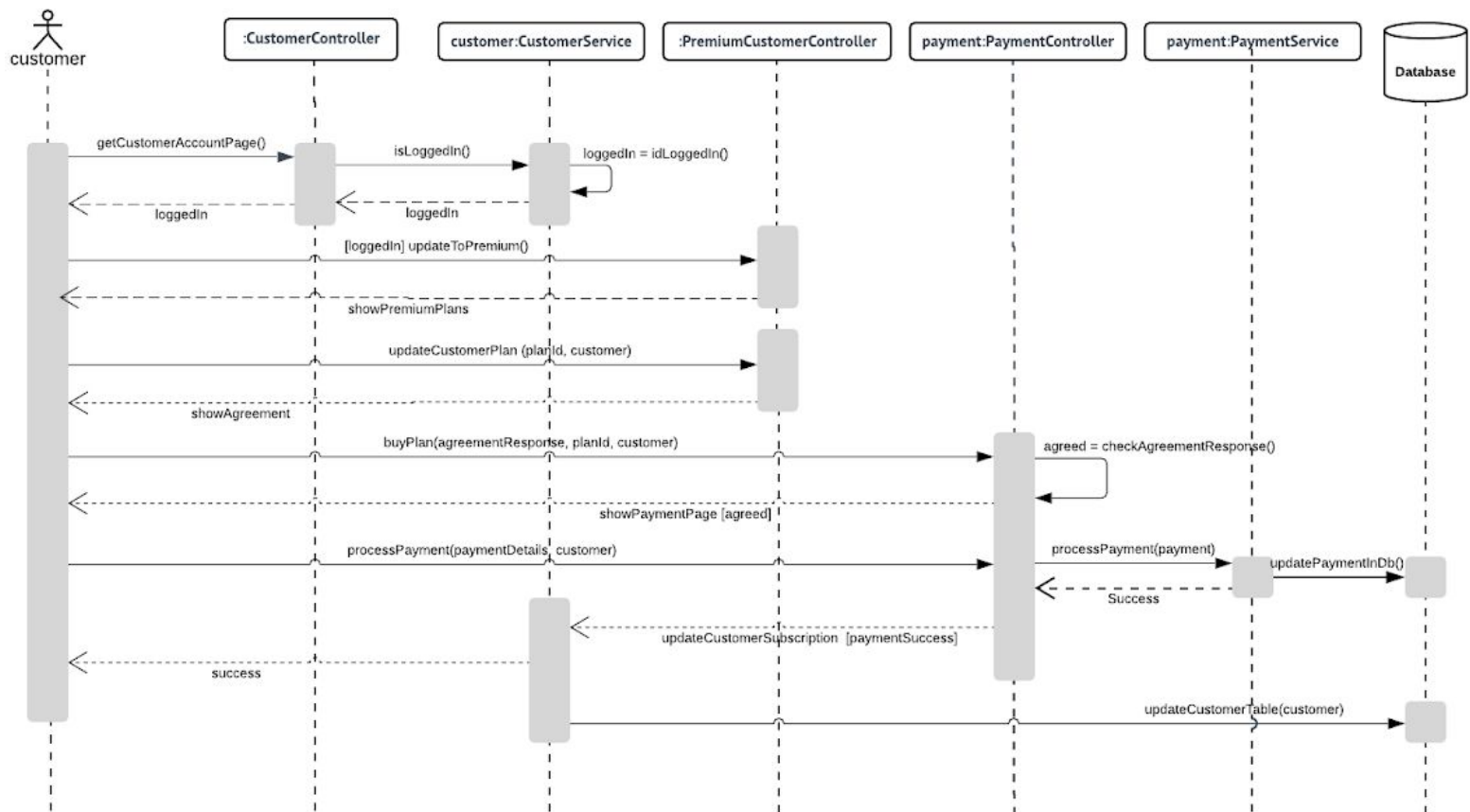
Use Case ID	UR-11
Use Case Name	Add Movie Preferences
Description	Customer should be able to add his/her movie preferences.
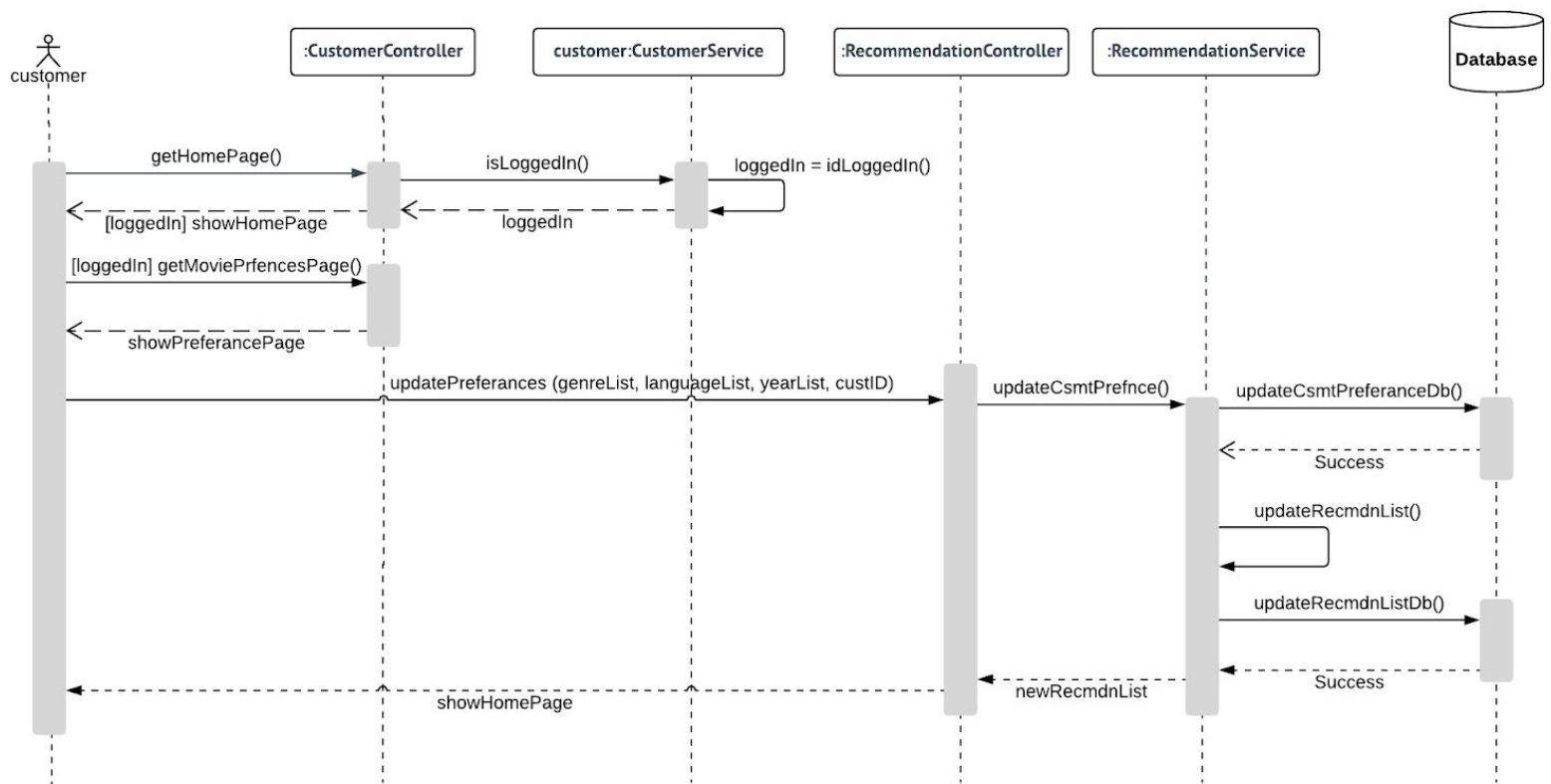
Class Diagram

Note: A clearer version of this diagram can be found as a separate file in git.

Controller

+request: HttpRequest
+response: HttpResponse

+processRequest(HttpRequest): HttpResponse

RecommendationController

+updatePreferances (genreList, languageList, yearList, custID): void
+updateWatchedMovieList (watchedMovieList): void
+updateMovieRating(movieIdRatingMap, customerID): void
+downloadRecmdedMovieList(customerID): void

PremiumCustomerController

+updateToPremium(): void
+updateCustomerPlan (planId, customer): void

CustomerController

+login(username: String, password: String): void
+signUp(Customer): void
+deleteCustomerAccount(Customer): void
+getHomePage(): void
+getMoviePrfencesPage(): void
+getCustomerAccountPage(): void
+viewAllMovieList(): void

AdminController

+login(username:String, password:String): boolean
+getHomePage(): void
+getCustomersDetails(): void
+getMoviesDetails(): void

PaymentController

#paymentId: int
#amount: float

+buyPlan(agreemnt: Boolean, planId: int, Customer)
+processPayment(paymentDetails: String, Customer): void
+showPaymentSuccess(): void
+processRefund(Payment): void
+checkAgreementResponse(): Boolean

RecommendationService

+updateCsmtPrefnce(genreList, languageList, yearList, custID): Boolean
+updateCsmtPrefnceDb(genreList, languageList, yearList, custID): Boolean
+updateRecmdnList(): Boolean
-updateRecmdnListDb(): Boolean
-updateCsmtPrefnceDb(): Boolean
+updateWatchedMovieList (watchedMovieList): Boolean
+updateMovieRating(movieIdRatingMap): Boolean
+downloadRecmdedMovieList(customerID): List<Movie>

CustomerService

+validateUser(username, password): Customer
+signUpUser(Customer)
+deleteCustomerAccount(Customer): Boolean
+updateCustomerPlan (planId, customer): void
+viewAllMovieList(): List<String>

AdminService

+addMovieDetails(): void
+updateMovieDetails(String): boolean
+addNewCustomers(): void
+modifyCustomerDetails(String): boolean
+updateMovieRating(String, int): boolean

PaymentService

- isPaymentValid(): boolean
+processPayment(String, Customer): Boolean
+processRefund(Payment): Boolean
+customerMonthlyPaymen(customerID): void
+updatePaymentInDb(Payment):void

MovieService

+addMovieDetails(): void
+updateMovieDetails(String): boolean
+updateMovieRating(String, int): boolean
+updateMovieRating(movieIdRatingMap): Boolean

Recommend

+customerID: String
+genrePrfrnceList: List<String>
+languagePrfrnceList: List<String>
+yearPrfrnceList: List<String>
+watchedList: List<String>

+getRecmdMovies(customerID): List<Movie>

Customer

-name: String
-phoneNum: String
-isPremiumCustomer: Boolean

+getPhoneNumber(): String
+setPhoneNum(String): void
+isPremiumCustomer(): Boolean
+setPremiumCustomer(Boolean): void

Admin

-role: int

+getRole(): int
+setRole(int): void

Movie

-id: String
-title: String
-votes: int
-rating: int
-year: int
-genre: String
-language: String
-plot: String

Payment

-paymentID: String
-customerID: String
-paymentMethod: String
-dateOfTransaction: Date
-amount: Double

User

#username: String
#password: String
#userID: String
#accountAlive: Boolean

#updatePassword(String): Boolean
#isValidCustomer(): Boolean