PROJECT Design Documentation

Team Information

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- Team members
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Executive Summary

This project's purpose is to act as an E-Store used for renting monkeys. It is a website in which users can search, sort, and rent monkeys for specified dates. It can also be used by an admin account to create new monkey listings, edit monkey listings, or delete monkey listings. The E-Store will offer a review feature in which users who have rented a monkey in the past can write a review for it that other users can see.

Purpose

The main goal of this project was to provide both a front-end for an e-store focused on renting monkeys for parties and an API to handle inventory management and data persistence. Another goal of this project is to handle authentication for both customers and owners, as well as a working shopping cart for customers to store desired products in until they are ready to proceed with renting.

Glossary and Acronyms

Term	Definition
SPA	Single Page Application
MVP	Minimum Viable Product
DAO	Data Access Object
API	Application Programming Interface
REST	Representational State Transfer
MVVM	Model–View–ViewModel

Requirements

Our application will provide users with the ability to rent various monkeys as well as allowing the owners to actively manage the site through admin control. In this project, we will be required to develop controls for the owners to utilize to effectively manage the e-store, such as as creating, deleting, and updating the monkeys within the store. We will also be required to effectively build a website from the front-end, developing product pages that show the details of each monkey, a way to search through the list of monkeys by means of a

search bar and filters, and a shopping cart to checkout. In addition, we will have to create a system for users and admins to log in, as well as a way for users to post reviews of monkeys they previously rented, which will contribute to a rating system for the monkeys.

Definition of MVP

The minimum viable product for this project is a running website in which users have access to a variety of monkeys, which they can add to a shopping cart and request to rent. It should also have an admin account which has the ability to change the inventory on the website. Lastly, users should be able to write reviews for monkeys that they rented that can be accessed by other users.

MVP Features

- Login Backend
- Login Page
- Owner Features
- Product Page
- Search for product
- Get a product
- Update a product
- Create a new product
- Delete a product
- Search bar
- Enable Filters
- Shopping Cart
- Rental Backend
- Post Review
- Read reviews

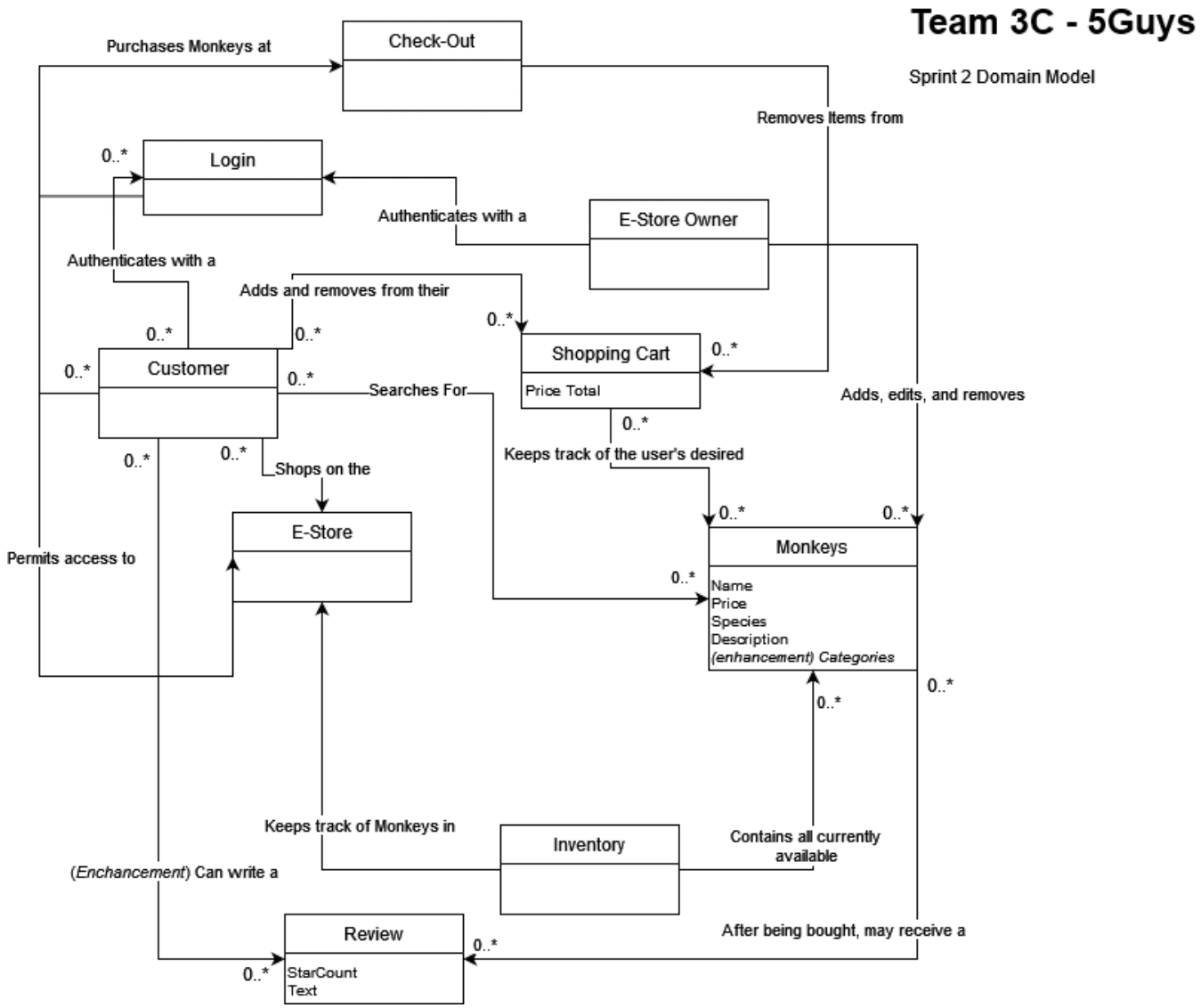
Roadmap of Enhancements

Our biggest enhancement is the ability to rent a monkey for your event rather than simply purchasing one, which would be impractical to do through an e-store.

We plan to implement the ability to read customer reviews on the monkey you are currently viewing, as well as the ability to write reviews for monkeys who you have previously rented.

Application Domain

This section describes the application domain.



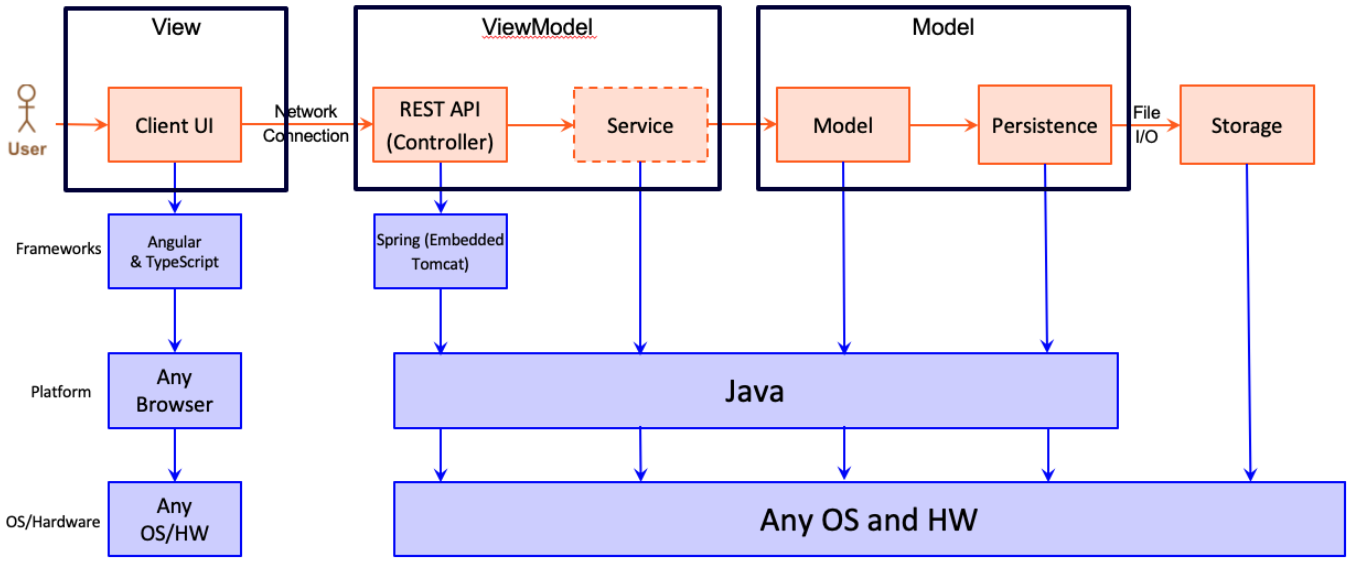
There are two ways to access the e-store. Using a username, the system authenticates each user as either a customer or an admin. Customers on the e-store can view a list of products and add or remove them from their shopping cart, from which they can later checkout from. Customers can also leave written reviews for monkeys that they have previously rented. Unlike customers, the owner, authenticated as admin, can manage the e-store's inventory, which contains all of the products in the e-store. The owner can manage the e-store by adding, removing, or updating the specific details of monkeys in the inventory.

Architecture and Design

This section describes the application architecture.

Summary

The following Tiers/Layers model shows a high-level view of the webapp's architecture.



The e-store web application, is built using the Model–View–ViewModel (MVVM) architecture pattern.

The Model stores the application data objects including any functionality to provide persistance.

The View is the client-side SPA built with Angular utilizing HTML, CSS and TypeScript. The ViewModel provides RESTful APIs to the client (View) as well as any logic required to manipulate the data objects from the Model.

Both the ViewModel and Model are built using Java and Spring Framework. Details of the components within these tiers are supplied below.

Overview of User Interface

When launching the e-store, the user will first be greeted to a login page where the user will be prompted to login with their username or create a new account. Once the user has either logged in or created an account, they will be redirected to the productlist page, where the list of monkeys is displayed, as well as a search box to find specific monkeys. If the user is an admin, they can also edit and add monkeys while on this page via text boxes and buttons. When clicking on a monkey, the monkey's page will be displayed, showing information regarding the species, name, id, description, cost, and availability of the monkey, as well as an option to add it to the user's cart. When on the productlist page the user can be redirected to their cart by clicking on the cart icon and from their they will be taken to a page where they can remove monkeys from their cart as well as checkout.

View Tier

When opening the website UI, the first thing a user will see is the Login Page Component which will give an option to enter your username or create a new one. If the username "admin" is typed, the Owner Features Page will be opened. This page contains a user interface which allows the admin to update monkey information, create a new monkey for the estore, or delete a monkey from the estore.

If the user logs in with a customer account or creates a new account (which will automatically be a customer account) at the Login Page, the Buyer Product List Component will be opened up. The Buyer Product List contains a list of all the monkeys in the estore and another list of monkeys which is generated based on the search using the search bar.

After clicking a button for a specific monkey from the Buyer Product List, the Product Page Component will be opened on the same page. This will contain information about the selected monkey and an option to add to cart.

The Shopping Cart Component is shown on the Buyer Product List. This displays the monkeys currently in the user's shopping cart as well as a button to checkout and a button for each monkey to remove from the shopping cart.

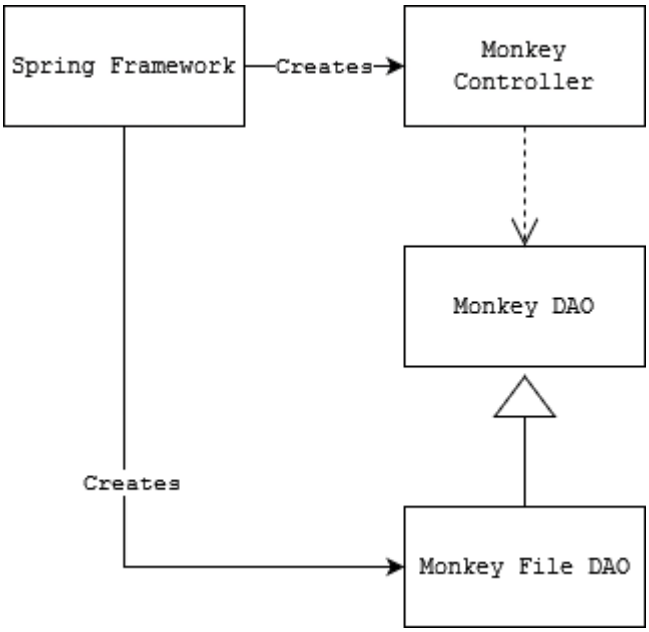
ViewModel Tier

The ViewModel Tier consists of the MonkeyController Class, the UserController Class, the Monkey Service Component, and the User Service Component. The MonkeyController class handles REST API requests involving monkeys in the e-store. The UserController Class handles REST API requests involving user accounts.

The Monkey Service Component sends REST API requests to the MonkeyController to obtain information from the monkeys.json file where monkey information is stored. The User Service Component sends REST API requests to the UserController to obtain user information.

Model Tier

The Model Tier of our project communicates with the ViewModel Tier by receiving updates regarding user actions and requests, and in return sending it notifications relating to the back-end functions of the e-store and its inventory. It also houses our business logic and handles the system's data persistence. The logic is specifically concerned with managing the e-store's monkeys and users. The component concerned with product management gives the abilities of creating and removing monkeys from the inventory, as well as updating a monkey's specific details, such as one's species, description, and price. The user component provides the necessary abilities to create or manage specific users, manage the items in a user's shopping cart, and managing a user's list of currently rented monkeys.



Our project's backend also uses the Spring Framework. The Spring Framework creates the Monkey Controller, which depends on the Monkey DAO, which defines the interface for Monkey objects in the system. The MonkeyFileDAO inherits the Monkey DAO and implements the functionalities defined in the DAO. Upon instantiation of the MonkeyController object, the system will inject the MonkeyFileDAO into the

MonkeyController object so that the MonkeyController can handle REST API requests relating to Monkey objects.

Static Code Analysis/Design Improvements

> *Discuss design improvements that you would make if the project were to continue. These improvement should be based on your direct analysis of where there are problems in the code base which could be addressed with design changes, and describe those suggested design improvements.*

> *With the results from the Static Code Analysis exercise, discuss the resulting issues/metrics measurements along with your analysis and recommendations for further improvements. Where relevant, include screenshots from the tool and/or corresponding source code that was flagged.*

Testing

To ensure that the project is meeting our requirements, we conducted two types of tests. Acceptance testing allowed us to ensure that requirements related to the front-end of the e-store were working as expected, while Unit Testing allowed us to test the system itself and make sure it is handling everything correctly on the back-end.

Acceptance Testing

- 30 of stories that we finished pass all of their testing criteria
- 4 of the stories partially pass acceptance criteria
- 6 of the stories have yet to be tested

Most of the stories are currently passing their acceptance criteria tests. The issues found in the stories that are currently partially passing or failing came about when we noticed that they work or do not work in specific scenarios, or there is simply a small detail that is technically not correct. For example, the buyer product list's rented status does not currently update until the page is left and and returned to. These issues do not concern us as we are confident that we will be able to get these stories to a passing status in little time. The stories that have not been tested are the stories related to customer reviews, as they have not been implemented yet.

Unit Testing and Code Coverage

The way that we have handled unit testing is by creating a doc of all tests that need to be written and allowing team members to evenly split the work among themselves. We have 100% coverage in the model tier and 97% coverage total. Our goal for overall coverage is 90% minimum but we like to strive for higher if we have time, we chose this number because it results in a balance of having enough testing without wasting time working on tests when more important parts of the project need to be done. Our lowest current element is estoreapi with a current coverage of 88%, the coverage is only this low because main is not currently tested.

estore-api

estore-api

Element	Missed Instructions	Cov.	Missed Branches	Cov.	Missed	Cxty	Missed	Lines	Missed	Methods	Missed	Classes
com.estore.api.estoreapi.controller		95%		86%	3	26	4	92	0	15	0	2
com.estore.api.estoreapi		88%		n/a	1	4	2	7	1	4	0	2
com.estore.api.estoreapi.persistence		100%		93%	2	40	0	107	0	24	0	2
com.estore.api.estoreapi.model		100%		n/a	0	24	0	36	0	24	0	2
Total	24 of 1,147	97%	5 of 54	90%	6	94	6	242	1	67	0	8

Our strategy in creating unit tests is to attempt to cover every method by checking its possible success and failure conditions ensuring that they match what we expect them to. For example when writing unit tests for the creation of a monkey in the MonkeyController class, we tested the output from the MonkeyController Creation method when the monkey is created correctly, when the monkey creation is rejected, and when the MonkeyDAO throws an error.