



Spec - Modoya

General Description

Modoya (used to be "LoopLiving") is a furniture platform designed for young, style-conscious people on a budget, as well as anyone who cares about sustainability. We've observed that many college students purchase cheap, fast furniture at the beginning of the school year, only to discard it on the roadside at the end of the semester, even when it's still usable. This creates a significant amount of waste. Modoya aims to solve this problem with a core mission: *"to make a stylish lifestyle more accessible while promoting environmental sustainability."*

The platform has two main parts:

- Official Designer Rentals
This is a service run by the platform, offering designer and stylish furniture. Users can choose to either rent furniture by the month or buy it outright.
- Public Second-hand Marketplace
This is a space for users to easily buy and sell their own used furniture, which helps give items a second life and reduces waste.

How it Will be Built (The Tech Side)

👉 The initial focus will be on developing a **website**. The core backend logic will be tested using a command-line interface. A web app will be considered only after the core features are mature.

Backend	Python Flask	
Frontend	HTML, CSS, JavaScript	
Dataset	A simulated furniture database (stored in JSON or csv format)	Note: Cannot find any readily available free furniture APIs/dataset for now.

Data Handling	Pandas	
Prototyping	Google Colab for testing Figma for UI designing	
Future Nice-to-Have: AI Suggestion Agent	1. Morden Style: Focuses on modern interior design principles like space optimization, aesthetics, and functionality.	2. Feng Shui Advisor: Blends traditional principles with AI to offer actionable advice, helping to harmonize the user's living space.
External APIs	Gemini 2.5 Pro or GPT-5 Pro	

Task Vignettes / User Activity Flow

Story 1: Sarah's Rental Experience

Sarah opens the Modoya website and sees a list of popular, curated furniture. On the left side of the page, she uses the filters. She picks "Mid-Century Modern" from the "Style" dropdown menu and adjusts the "Price Range" slider to a maximum of \$200/month. The page updates instantly with furniture that matches her choices (being handled by JavaScript).

She clicks on a picture of an "Eames Lounge Chair", which takes her to the product detail page. She sees two prices (monthly rental and a price to buy it now). She chooses a "six-month" rental term and clicks "Add to Cart." She then clicks the cart icon in the top-right corner.

On the checkout page, she selects "Home Delivery," chooses a delivery time for next Wednesday afternoon from a small calendar, and confirms her address. She enters her credit card info and clicks "Complete Rental." A "Success!" message appears, and the new order details are added to her personal account page.

Technical Details:

- Requires a structured furniture database with filterable fields such as "style," "brand," "type," and "rent/sale price."

- The user account system must be able to manage current rentals, rental history, lease expiration dates, and wishlist/favorites.
- The backend needs to handle rental order generation and status tracking (e.g., pending delivery, in-use, pending return).
- Logistics will be simulated; the system will only need to update the status.



Story 2: Allen's Experience as a Seller

Allen's friend gave him a floor lamp he doesn't need, so he decides to sell it on the "Marketplace" section of Modoya. After logging in, he clicks "Sell an Item." He inputs the item serial number, uploads a few photos of the lamp, fills in the title, description, and price, and chooses "Local Pickup Only."

A couple hours later, a buyer contacts him through the site's messaging system, and they arrange a time to meet. After the transaction is complete, Allen goes back to the site, marks the item as "Sold," and leaves a positive review for the buyer.



Technical Details:

- The platform must support C2C listings, allowing users to upload furniture photos, write descriptions, and set prices.
- A simple internal messaging system would be needed for buyers and sellers to communicate (this can be a goal for Version 2).
- Rental and purchase processes need to be handled separately but can share the same furniture database.



Technical Flow

Data Flow: User → Flask Web → Database

- **User Interaction (Frontend):** Users interact with the Flask application through their web browser to browse, filter, and place orders.
- **Application Logic (Backend):**

- **Receive Requests:** Flask receives HTTP requests from the user (e.g., "show all mid-century modern chairs").
- **Database Query:** The application queries the SQLite/JSON database to retrieve the corresponding furniture data.
- **Business Logic:** It processes the logic for rentals/purchases, calculates prices, and updates the user's dashboard.
- **Render Page:** It inserts the queried data into an HTML template and returns the final web page to the user.
- **Data Storage:**
 - **Furniture Database:** Stores all detailed information about the furniture.
 - **User Database:** Stores user account information and their rental/purchase history.

Data Structures

- `furniture_dataframe` : A Pandas DataFrame that holds all the furniture information.
- `user_filters_dict` : A dictionary to keep track of the user's current filter settings (e.g., style, price).
- `shopping_cart_list` : A list of items the user has added to their cart.
- `favorites_list` : A list of item IDs that the user has saved to their wishlist.
- `reviews_dict` : A dictionary to store user reviews for items or sellers.

Core Functions

- `load_furniture_data()` : Reads the data from `furniture.json` file.
- `filter_furniture()` : Takes all the furniture data and the user's filters, and returns a new list of items that match.
- `create_rental_order()` : Handles the checkout logic for rentals.
- `create_c2c_listing()` : Handles the logic for a user posting a new item for sale.

Nice-to-have Feature

 **AI Agent Feature Flow (Consider Feng Shui as an example.)**

1. A user clicks a "Feng Shui Advice" button on their profile or a specific furniture page.
 2. The Flask backend receives the request. It packages pre-defined Feng Shui rules (hard-coded rules like "the headboard of a bed should be against a solid wall" or "a desk should not face the door") along with the characteristics of the furniture in question (e.g., "this is a bed").
 3. This packaged information is sent as a prompt to an LLM API. For example: "A user wants to place a bed. Based on the following Feng Shui rules {list of rules}, please provide 3 layout suggestions and explain how to use {recommended furniture types} to mitigate any negative energy."
 4. The text-based advice returned from the LLM API is then displayed on the web page.
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Final Assessment

Biggest Change from the Initial Idea

The biggest change was to clearly split the project into two main sections: **"Official Rentals"** and a **"Public Marketplace."** This makes the business model feel more complete. I am also adding some "nice-to-have" features, like **"AI Layout Advisor."** This advisor will offer two distinct modes for users: 1) "Modern Design," focusing on aesthetics and space optimization, and 2) "Feng Shui," which provides advice based on traditional principles. This unique feature is designed to offer value beyond a simple transaction and serve as a differentiator from other platforms on the market.

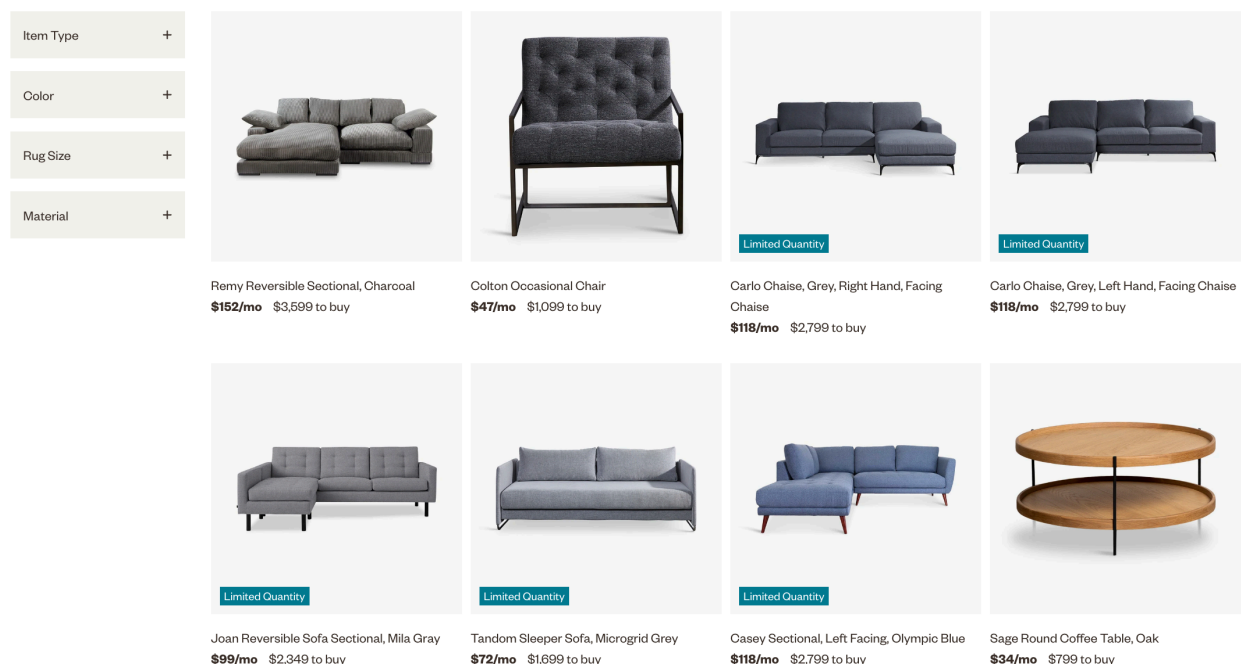
Confidence in Completing the Spec

After doing all the research, I feel excited but confident. 🦵 The core rental and sales processes follow standard e-commerce logic. Although I have never built a project from scratch, I have experience querying databases, which will be very helpful for backend development. The biggest challenge will be the visual vibe on the front end.

Biggest Potential Problems

The main challenge is sourcing high-quality furniture data. As the professor pointed out, there are no readily available free furniture APIs, and the dataset on Kaggle is more like an inventory list and lacks visual appeal. The biggest initial hurdle will be creating a rich, simulated database similar to what is seen on [fernish.com](https://www.fernish.com).

➔ **Solution:** I can try to use an AI (like Gemini) to generate a batch of mock data in JSON format, complete with detailed descriptions and image URLs, to get the project started. Using simple web scraping techniques might be another solution.



Areas I'm Least Familiar With and Might Need Help

- 1. Flask Application Architecture:** 0 experience building a website from scratch. Need help with the best way to structure the project's files and folders, plan the web page routes, and organize the code so it's easy to manage. I am really excited to embark!
- 2. Frontend-Backend Communication:** The details of how to make the JavaScript on the frontend effectively talk to the Python/Flask backend is a key area to learn.

- **Database Creation and Connection:** While I know how to query a database, designing a schema from scratch and connecting it to Flask is a new challenge for me.
- **Frontend Development:** Creating a user-friendly interface with a sense of aesthetic will require a significant amount of time learning frontend technologies (JavaScript, CSS), and I may need more guidance in this area.
- **LLM API Integration:** Although the concept is straightforward, designing effective prompts and handling the technical details of the API integration are areas that will require exploration.

Reference

▼ **LoopLiving - A Furniture Rental & Sustainability Platform**

Project Description

This platform's main feature is a designer furniture rental service. It allows people on a budget who still want to style their homes to use their favorite furniture for a period of time. This makes changing the interior style easy and flexible.

If you don't want to rent, you can also buy furniture affordably on the platform. You can always see at the beginning of every school year, a large number of students buy low-quality "fast furniture" from Walmart or Target. By the end of the semester, much of this furniture is abandoned on the roadside, even though it's still usable. This creates a huge amount of waste. Therefore, our platform also includes a marketplace to make buying and selling second-hand furniture easy, not limited to just designer brands.

The core concept is to make an aspirational lifestyle more accessible while promoting environmental sustainability. The guiding principle is: "Moving is tiring enough. Let's make decorating simple!"

Use Cases

- Sarah is a young designer just moved into a new apartment in New York. She wants a mid-century modern living room but can't afford expensive designer pieces. Using **Modo**, she filters by "mid-century modern" and rents a classic Eames lounge chair and side cabinet for six months. When her rental period ends, she decides to try Japanese Wabi-sabi style. She easily schedules the return online and selects new items, making the entire process enjoyable and hassle-free.
- Allen is a new student at ISU. His senior is moving and gives him an expensive floor lamp that he can't take with him but feels is too good for Goodwill. Allen suggests selling it on **Modoya**. Allen also browses **Modoya** to rent quality IKEA furniture. He wants to avoid cheap Walmart furniture, but IKEA is too far away and requires assembly, so he prefers to rent pieces that are ready to use.

Feasibility

Implementation Challenge




The primary real-world challenge is logistics (delivery, storage, and cleaning). For this project, these offline operations will be simulated. The main technical challenge will be designing a smooth, reliable software system to manage the rental and return process. And because the platform is like an e-commerce site, it will require a database.



Self-Assessment

I don't have experience building a project by myself from start to finish, as my background is mostly in user studies, so this will be a new challenge for me. I have experience querying databases to get data, but I have never built a database and connected it to an application before. The project also needs a strong visual aesthetic, and I need to strengthen my knowledge of furniture brands, and interior styling.

This idea is something I'd actually use myself. Compared to the dating app which has more hype, this one just feels more practical and doable.

Future Spec Elements

 Users	 Problem Solved	 Interface & UI
- Young people interested in interior design	- The high cost of designer furniture.	A web and mobile app with Pinterest-like e-commerce styling. Users can

- Eco-conscious consumers - College town students.	- Environmental waste from the fast-furniture industry.	share/save styles or directly rent/buy items.
 Data	 Outcome	
A simulated furniture database (using JSON/SQLite) with images, description and price.	A fully functional (simulated) rental workflow and a user dashboard for managing rented items.	

Pending Items

1. Any existing furniture databases
2. Any competitive products?