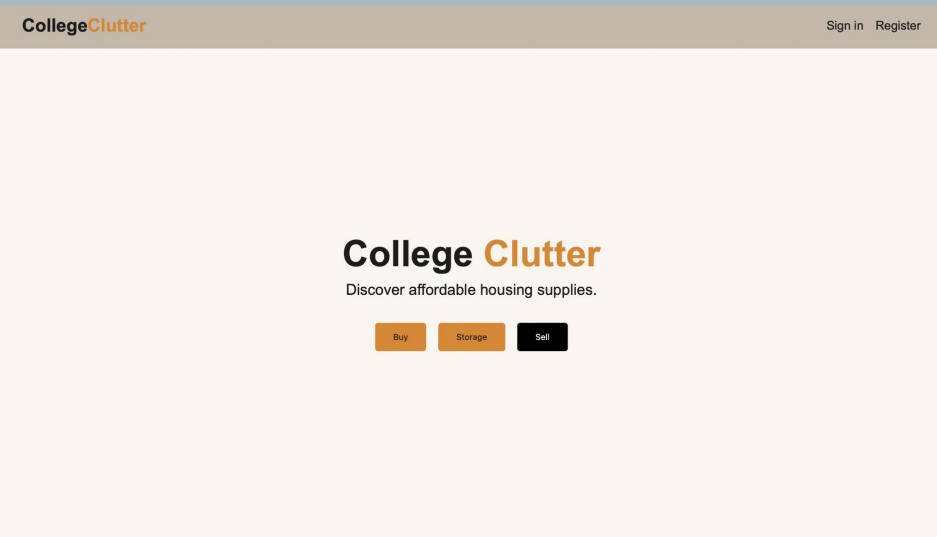


College Clutter



By:
Brandon Byrne
Sargam Nohria
Simran Lekhwani
(GROUP 36)

The project's vision.

Project's name: College Clutter

Description: Every year students buy new furniture every year to offset costs of storage and leading to tons of waste at the end of every semester. College Clutter is a website designed to connect students to other students and local storage facilities to collectively create optimal storage/selling opportunities. Waste and cost of living are both increasing at remarkable rate for students at Amherst. By offering a reasonable storage option we can give students an option to reduce costs between semesters and save on massive waste while improving local business outcomes during the down season.

Key functionalities: The website will be a lightweight platform that will use collective data from user inputs to generate optimal storage options with other users and local storage facilities. The user will have a simple drop-down interface to use commonplace data on furniture sets for ease of use and fast adoption. Users can list housing items for sale, buy items, or find storage for their items using the simple interface.

Tagged repository: <https://github.com/umass-byrneb/CS326-Group-36>

Milestone: #6

Issues on GitHub:

<https://github.com/umass-byrneb/CS326-Group-36/issues?q=is%3Aissue%20state%3Aopen%20milestone%3A%22Milestone%20%236%22>

The builders.

Brandon Byrne

Senior Computer Science Major | bbyrne@umass.edu

Background knowledge: C,C++, Python, Java, js and React

Other Interests: Hiking(46er) with my dogs 🐕🐕🐕

Reflection: I believe in this website as I personally have had these problems in the past and think it would improve student life at the end/beginning of the semester and decrease waste on campus

Role: backend development, front end development

Sargam Nohria

Senior Computer Science & Anthropology Major | snohria@umass.edu

Background knowledge: C, Python, Java, HTML, CSS

Other Interests: running, rock climbing, baking

Reflection: I am interested in increasing students' accessibility to affordable housing items and a more efficient exchange of existing resources. I believe this website will help people live well.

Role: wireframes/UI, front end developer

Simran Lekhwani

Senior Computer Science Major | slekhwani@umass.edu

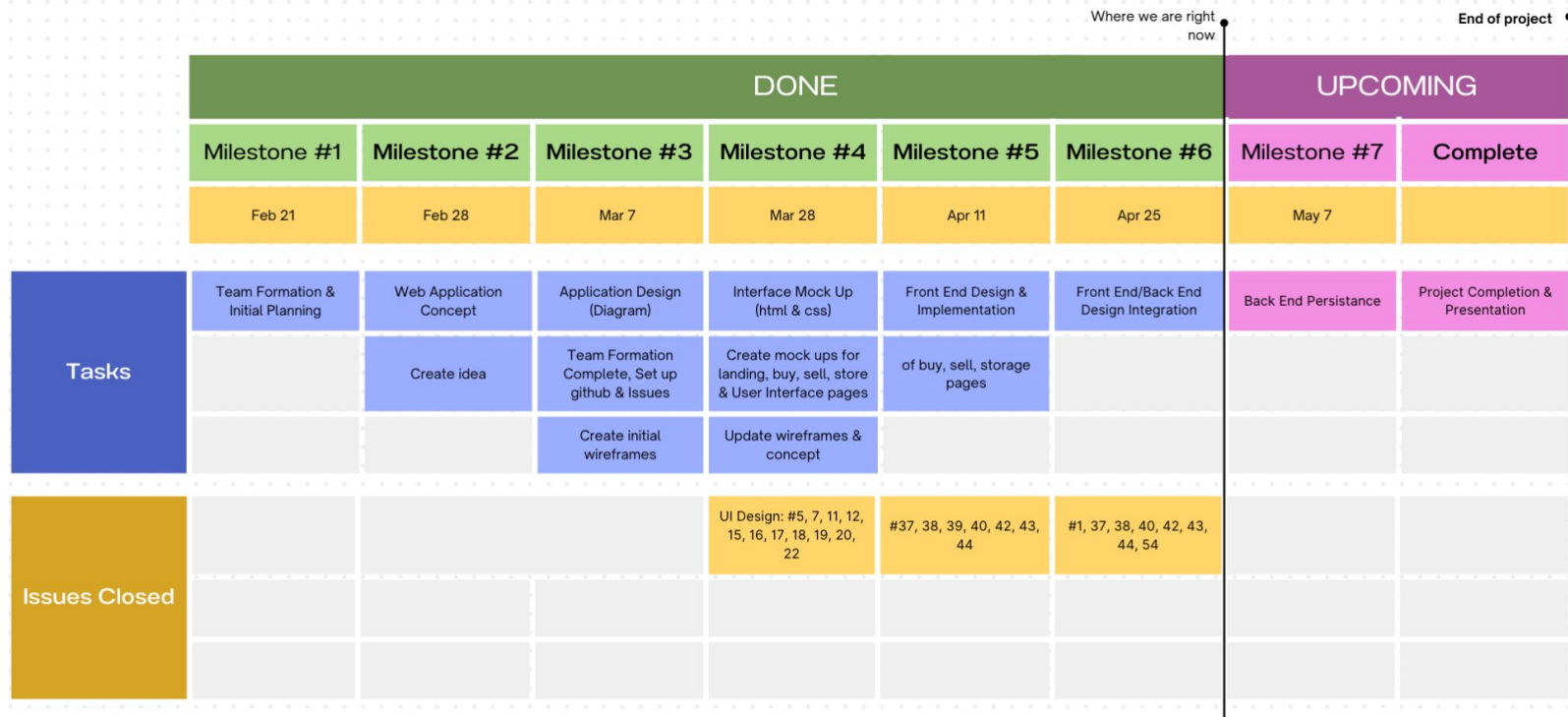
Background Knowledge: C, C++, Python, Java, Go, JS, SQL

Other Interests: Dancing, Rock climbing, Reading

Reflection: As a student who has lived off campus and is graduating as well, this application would be very helpful to reduce some stress associated with moving and relocating by introducing a platform that allows one to communicate with other individuals who are interested in selling or buying furniture.

Role: Backend development, front-end development

Historical timeline.



Brandon Byrne

Assigned Work Summary

Assigned Issues: #43, #44

Commits: login.js, RegistrationComponent.js, User.js, back end files, usertask

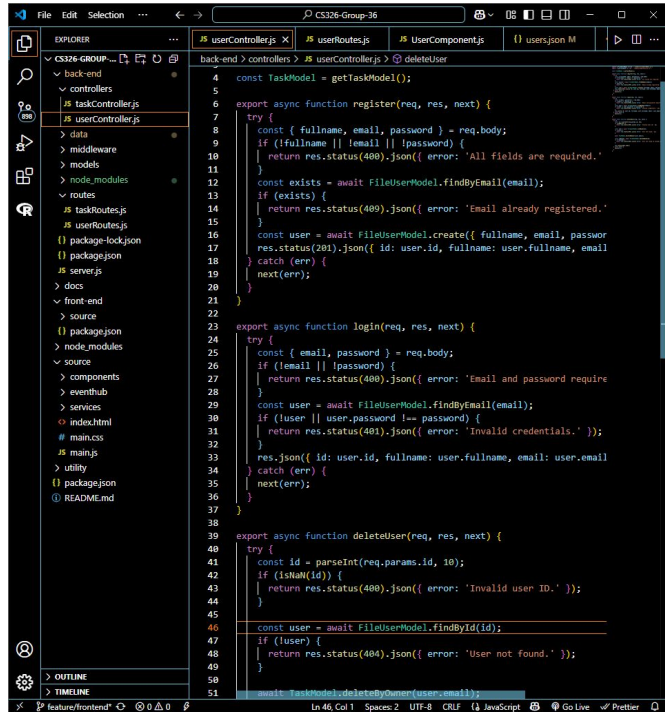
Tasks completed: Back-end integration: Added POST /v1/users/register and POST /v1/users/login endpoints. Wiredup models/fileUserModel.js, controllers/userController.js, routes/userRoutes.js. Ensured new users are persisted in data/users.json

Front-end wiring: Extended RegisterComponent to call /v1/users/register, handle “email already exists,” redirect to login. Extended LoginComponent to call /v1/users/login, store currentUser in localStorage, redirect to dashboardUpdated nav and route-guards so only logged-in users see Sell/User pages

- Links to PRs closed on GitHub:
- <https://github.com/umass-byrneb/CS326-Group-36/pull/61>
- <https://github.com/umass-byrneb/CS326-Group-36/pull/59>
- <https://github.com/umass-byrneb/CS326-Group-36/pull/60>

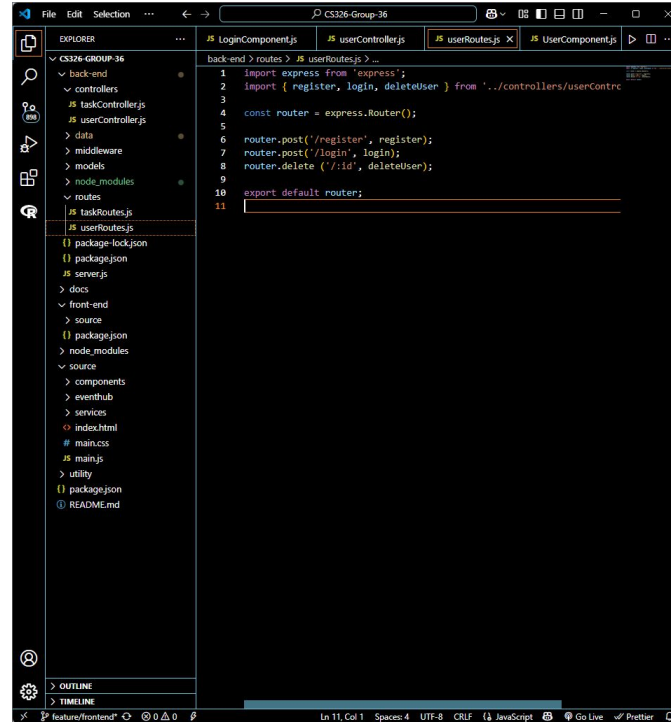
Brandon Byrne

Screenshots and demonstration



```
4 const TaskModel = getTaskModel();
5
6 export async function register(req, res, next) {
7   try {
8     const { fullname, email, password } = req.body;
9     if (!fullname || !email || !password) {
10      return res.status(400).json({ error: 'All fields are required.' });
11    }
12    const exists = await FileUserModel.findById(email);
13    if (exists) {
14      return res.status(409).json({ error: 'Email already registered.' });
15    }
16    const user = await FileUserModel.create({ fullname, email, password });
17    res.status(201).json({ id: user.id, fullname: user.fullname, email: user.email });
18  } catch (err) {
19    next(err);
20  }
21 }
22
23 export async function login(req, res, next) {
24   try {
25     const { email, password } = req.body;
26     if (!email || !password) {
27       return res.status(400).json({ error: 'Email and password required' });
28     }
29     const user = await FileUserModel.findOne({ email });
30     if (!user || user.password !== password) {
31       return res.status(401).json({ error: 'Invalid credentials.' });
32     }
33     res.json({ id: user.id, fullname: user.fullname, email: user.email });
34   } catch (err) {
35     next(err);
36   }
37 }
38
39 export async function deleteUser(req, res, next) {
40   try {
41     const id = parseInt(req.params.id, 10);
42     if (!isNaN(id)) {
43       return res.status(400).json({ error: 'Invalid user ID.' });
44     }
45
46     const user = await FileUserModel.findById(id);
47     if (!user) {
48       return res.status(404).json({ error: 'User not found.' });
49     }
50     await TaskModel.deleteByOwner(user.email);
51   }
```

filterUserModel



```
1 import express from 'express';
2 import { register, login, deleteUser } from '../controllers/userController';
3
4 const router = express.Router();
5
6 router.post('/register', register);
7 router.post('/login', login);
8 router.delete('/:id', deleteUser);
9
10 export default router;
```

UserRoutes

Brandon Byrne

Feature demonstration and code explanation

During this milestone I extended our back-end to fully support user authentication by adding two new endpoints, `/v1/users/register`` and `/v1/users/login``. In the data layer I created and wired up `FileUserModel`` methods to read, write, and query `data/users.json``, and in `UserController.js`` I implemented a `register`` action that validates incoming fullname, email, and password fields, checks for duplicate emails, and persists new users; likewise, the `login`` action looks up credentials, returns a 401 on failure, or the user profile on success. I then exposed these actions in `userRoutes.js`` under POST routes, and updated our Express server to serve them alongside our task API. On the front-end I enhanced `RegisterComponent`` so it captures form input, submits it as JSON to `/v1/users/register``, handles errors like “email already exists,” and, on success, resets the form and navigates to the login page. I also updated `LoginComponent`` to POST credentials to `/v1/users/login``, parse the JSON response, store the returned user object in `localStorage.currentUser``, and redirect to the user dashboard, while displaying prompts or hiding protected pages when no user is logged in. Overall, these tasks have fully knit together our registration and login flows, laying a solid foundation for persistent, secure user sessions across the application.

Brandon Byrne

Challenges and Insights

Obstacles:

During this milestone I ran into several obstacles that, while frustrating at the time, taught me valuable lessons about building a robust web application. Early on, I kept getting 404 errors or HTML responses instead of JSON because my Express route mounts didn't match my `router.post()` definitions—this drove home the importance of having a clear, shared API contract and double-checking base paths versus endpoint paths. I also hit “Cannot use import statement outside a module” errors when mixing CommonJS and ES modules, which led me to learn that adding `"type": "module"` to `package.json` is essential for consistency across our Node environment. Finally, managing authentication state in `localStorage.currentUser` worked for now, but the repeated JSON parsing and manual checks at each entry point revealed the limitations of simple client-side state and underscored the future need for a token-based approach. Together, these hurdles reinforced the importance of precise configuration, consistent conventions, and thinking ahead about state management.

Lessons Acquired:

Working within our team environment surfaced several key takeaways about collaboration. First, drafting even a one-page API spec early prevented wasted effort and misaligned assumptions—front-end and back-end developers could work in parallel without stepping on each other's toes. Second, our modular folder structure (separating components, services, controllers, and models) allowed each teammate to own distinct areas of the codebase, reducing merge conflicts and clarifying responsibilities. Finally, instituting a pull-request and code-review process fostered knowledge sharing and caught both logic errors and stylistic inconsistencies before they reached staging, which boosted code quality and helped everyone learn best practices more quickly.

Brandon Byrne

Future improvements & next steps

Future Improvements:

As we solidified the core flows, we also identified several areas of technical debt and opportunities for optimization. Storing plaintext passwords in `users.json` is a critical security risk that must be addressed by integrating a hashing library. Relying on `localStorage` for session state lacks server-side validation and timeout controls, suggesting a migration to JWT-based authentication. Our file-based JSON storage is vulnerable to race conditions under concurrent writes and won't scale well—moving to a real database (even a lightweight one) would improve both performance and reliability. Form validation currently depends on `alert()` pop-ups; a better user experience would use inline validation messages and disable the submit button until fields are valid.

<https://github.com/umass-byrneb/CS326-Group-36/issues/62>

<https://github.com/umass-byrneb/CS326-Group-36/issues/63>

Sargam Nohria

Assigned Work Summary

Assigned Issues: #40, #42

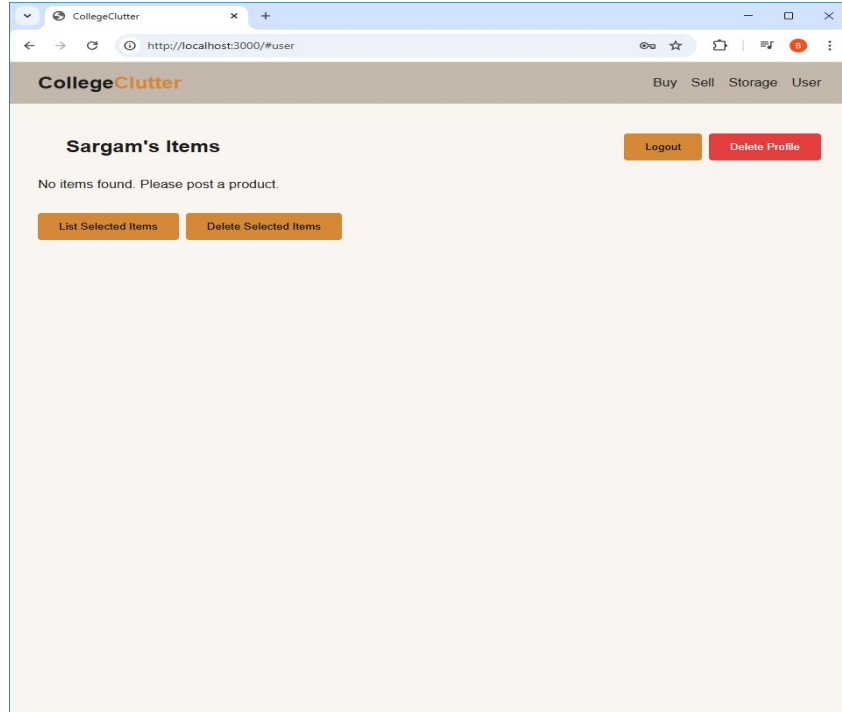
Commits: UserPage, BuyPage, Backend File restructure

Tasks completed: On the Buy page I wired up GET /v1/tasks, filtered only listed: true items from all users, and rebuilt our dynamic UI. Together these changes close the loop: Sell → User dashboard (draft/unlisted) → List for sale → Buy page (public listing).

- Links to PRs closed on GitHub:
- <https://github.com/umass-byrneb/CS326-Group-36/pull/58>
-

Sargam Nohria

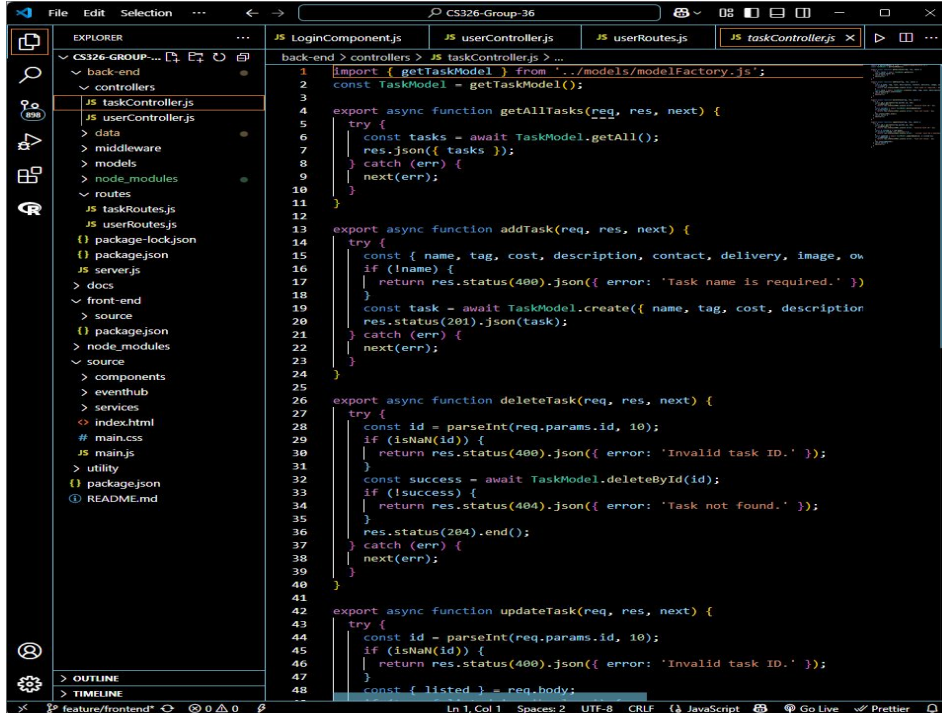
Screenshots & Demonstration



Revamped user page

Sargam Nohria

Screenshots & Demonstration

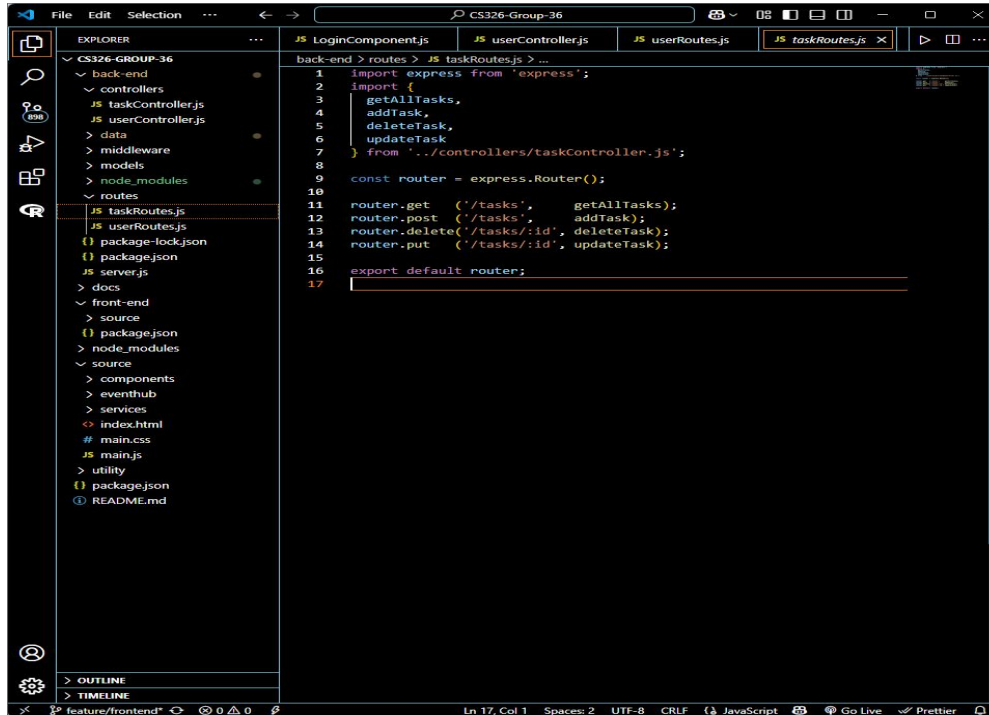


```
1 import { getTaskModel } from '../models/modelFactory.js';
2 const TaskModel = getTaskModel();
3
4 export async function getAllTasks(req, res, next) {
5   try {
6     const tasks = await TaskModel.getAll();
7     res.json({ tasks });
8   } catch (err) {
9     next(err);
10  }
11 }
12
13 export async function addTask(req, res, next) {
14   try {
15     const { name, tag, cost, description, contact, delivery, image, ow } = req.body;
16     if (!name) {
17       return res.status(400).json({ error: 'Task name is required.' });
18     }
19     const task = await TaskModel.create({ name, tag, cost, description });
20     res.status(201).json(task);
21   } catch (err) {
22     next(err);
23   }
24 }
25
26 export async function deleteTask(req, res, next) {
27   try {
28     const id = parseInt(req.params.id, 10);
29     if (isNaN(id)) {
30       return res.status(400).json({ error: 'Invalid task ID.' });
31     }
32     const success = await TaskModel.deleteById(id);
33     if (!success) {
34       return res.status(404).json({ error: 'Task not found.' });
35     }
36     res.status(204).end();
37   } catch (err) {
38     next(err);
39   }
40 }
41
42 export async function updateTask(req, res, next) {
43   try {
44     const id = parseInt(req.params.id, 10);
45     if (isNaN(id)) {
46       return res.status(400).json({ error: 'Invalid task ID.' });
47     }
48     const { listed } = req.body;
```

taskController

Sargam Nohria

Screenshots & Demonstration



```
1 import express from 'express';
2 import {
3   getAllTasks,
4   addTask,
5   deleteTask,
6   updateTask
7 } from '../controllers/taskController.js';
8
9 const router = express.Router();
10
11 router.get ('/tasks',    getAllTasks);
12 router.post ('/tasks',  addTask);
13 router.delete('/tasks/:id', deleteTask);
14 router.put  ('/tasks/:id', updateTask);
15
16 export default router;
```

taskRoutes

Sargam Nohria

Code and UI explanation

Over this milestone I completed the integration of our back-end with both the User and Buy pages. On the User page, I replaced the previous in-memory mock data with a real GET `/v1/tasks` call, filtered those tasks by the logged-in user's email, and rendered each item along with checkboxes, a "List Selected Items" button that sets a listed flag via PUT `/v1/tasks/:id`, and a red "Delete Profile" button that cascades to delete both the user and all their items via DELETE `/v1/users/:id`. On the Buy page, I wired up a GET `/v1/tasks` request that pulls in every item marked listed: true, built a cost slider whose range is computed from the data, and implemented a responsive, case-insensitive prefix search bar, dynamic tag and delivery filters (complete with removable pill tags), and three sort buttons ("New", "Price ascending", "Price descending"). Together, these changes close the loop from drafting an item on Sell → managing listings on your dashboard → public sale on the Buy page.

Sargam Nohria

Challenges and Insights

- Along the way, several obstacles taught me important lessons. I spent time debugging 404s and HTML-in-JSON errors because my Express route mounts didn't match my router definitions, which reinforced the need for a precise, shared API contract. I also ran into Node's "import... outside a module" error until I learned to enable ES modules via "type": "module" in package.json. Managing front-end state in `localStorage.currentUser` worked but required repeated JSON parsing and careful null checks, highlighting both the power and pitfalls of simple client-side authentication. Finally, orchestrating the cascade-delete flow (delete user → delete all tasks → confirm) underscored the importance of operation ordering and error handling in server logic.

Working on this with my teammates underscored the value of collaboration practices. Drafting even a minimal API spec early meant front-end and back-end developers could code in parallel with confidence that our endpoints would align. Our modular folder structure—separating components, controllers, models, and routes—let each person own specific parts of the codebase without stepping on one another's toes. And instituting a pull-request review process caught subtle bugs (from filter logic to edge-case error handling) before merging, which not only improved quality but served as an ongoing learning opportunity for the whole team.

Sargam Nohria

Future improvements & next steps

- Fetching all tasks and filtering in the browser won't scale once we have hundreds of listings—server-side filtering, pagination, or virtual scrolling will be required. We currently store plaintext passwords and use localStorage for session state; we must integrate hashing and migrate for secure, verifiable authentication. Our file-based JSON storage can suffer race conditions under concurrent writes and isn't suitable for production; migrating to a lightweight database would improve reliability.
- <https://github.com/umass-byrneb/CS326-Group-36/issues/64>
- <https://github.com/umass-byrneb/CS326-Group-36/issues/65>

Simran Lekhwani

Assigned Work Summary

Assigned Issues: #54 (Storage Page)

Commits: Back-end integration (routes, controller, model, data structure); front-end updates (SellComponent, UserComponent, Storage Service and Storage Remote Service)

Tasks completed:

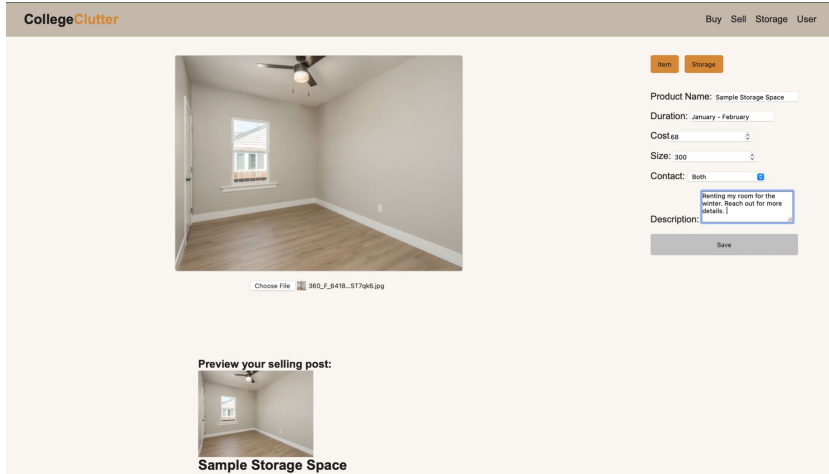
Completed the back-end integration for the Storage page. Added GET /v1/storage/listings and POST /v1/storage/listings endpoints to add and retrieve storage items from the in-memory data structure for storage (storage.json). Also added a PUT /v1/storage/listings/:id endpoint to update a listing when it gets listed by the user. Added respected routes (storageRoutes), controller (storageController), model (fileStorageModel) and in-memory data structure (storage.json) for the storage page.

Updated the front-end, mainly the user and sell pages, to redirect storage space related posts to the storage listing endpoint (POST and PUT /v1/storage/listing). In addition, instead of loading from a fake service (from milestone 5), the storage page loads the current storage listings using a GET request to the in-memory data structure on the back end.

- Links to PRs closed on GitHub: <https://github.com/umass-byrneb/CS326-Group-36/pull/66>

Simran Lekhwani

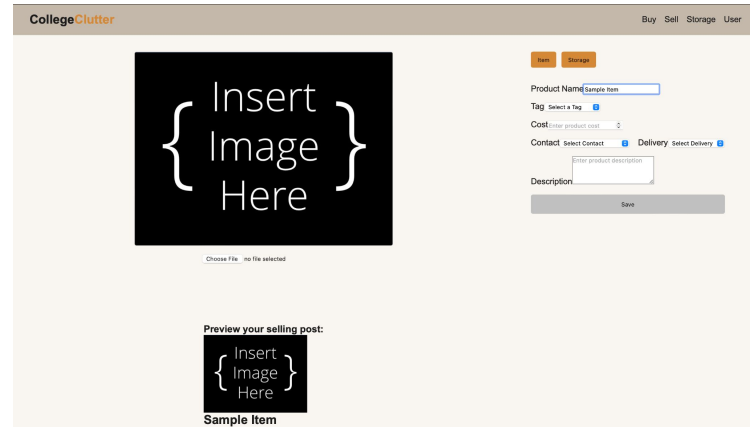
Screenshots and Demonstration



The screenshot shows the 'Storage' form in the CollegeClutter application. The form is titled 'Storage' and includes a 'Product Name' field with the value 'Sample Storage Space'. Below this are fields for 'Duration' (January - February), 'Cost' (100), 'Size' (300), and 'Contact' (both). A 'Description' field contains the text 'Renting my room for the winter. Search out for more details.' A 'Save' button is at the bottom. To the left of the form is a large image of a room, and below it is a smaller preview image labeled 'Sample Storage Space'.

Storage form is populated upon clicking the Storage button

Item Sell form is populated upon clicking the Item button



The screenshot shows the 'Item' form in the CollegeClutter application. The form is titled 'Item' and includes a 'Product Name' field with the value 'Sample Item'. Below this are fields for 'Tag' (Select a Tag), 'Cost' (Enter product cost), 'Contact' (Select Contact), 'Delivery' (Select Delivery), and 'Description' (Enter product description). A 'Save' button is at the bottom. To the left of the form is a large image placeholder with the text 'Insert Image Here', and below it is a smaller preview image labeled 'Sample Item'.

Simran Lekhwani

Screenshots and Demonstration

The screenshot displays a VS Code workspace for a project named 'CS326-Group-36'. The Explorer sidebar on the left shows a directory structure with folders for 'back-end', 'controllers', 'data', 'middleware', 'models', 'routes', and 'source'. The 'routes' folder is expanded, showing 'storageRoutes.js' selected. The main editor area is split into two panes. The left pane shows 'server.js' with the following code:

```
1 // console
2
3 // import storageRoutes from './routes/storageRoutes.js'
4 import { errorHandler } from './middleware/errorHandler.js';
5
6 const app = express();
7 const PORT = process.env.PORT || 3000;
8
9 const __filename = fileURLToPath(import.meta.url);
10 const __dirname = path.dirname(__filename);
11 const frontendPath = path.resolve(__dirname, '..', 'front-end');
12
13 app.use(express.static(frontendPath));
14 app.use(express.json({ limit: '10mb' }));
15
16 app.use('/v1', taskRoutes);
17 app.use('/v1/users', userRoutes);
18 app.use('/v1/storage', storageRoutes);
19
20 app.use(errorHandler);
21
22 app.get('/', (_req, res) => {
23   res.sendFile(path.join(frontendPath, 'index.html'));
24 });
25
26 app.listen(PORT, () => {
27   console.log(`Server running at http://localhost:${PORT}`);
28 });
```

The right pane shows 'storageRoutes.js' with the following code:

```
1 import express from 'express';
2 import { getAllListings, addStorageItem, updateStorageItem } from './controllers/storageController.js';
3
4 const router = express.Router();
5
6 router.get('/listings', getAllListings);
7 router.post('/listings', addStorageItem);
8 router.post('/listings/:id', updateStorageItem);
9
10 export default router;
```

At the bottom, the Terminal window shows the output of a git commit:

```
[simran/backend 6667ac8] Commented out debugging statements. Didn't remove for future debugging.
4 files changed, 17 insertions(+), 37 deletions(-)
(base) simranlekhwan@Simrans-MBP front-end % git push origin simran/backend
Enumerating objects: 23, done.
Counting objects: 100% (22/22), done.
Delta compression using up to 8 threads
Compressing objects: 100% (12/12), done.
Writing objects: 100% (12/12), 1.08 KiB | 1.08 MiB/s, done.
Total 12 (delta 8), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (8/8), completed with 8 local objects.
To https://github.com/umass-byrneb/CS326-Group-36.git
+ master: master -> simran/backend
```

Shows the breakdown of the back-end for modularity and isolation.

In addition, shows the new routes created to support storage functionality

Simran Lekhwani

Code structure and Organization:

For modularity, the back-end is structured in different “modules” or directories: controllers, data, middleware, model, routes, and server.js

Middleware does error handling.

Under routes, there is a specific file dedicated for Storage page routes, which perform actions based on asynchronous functions imported from the Storage Controller in the controllers dir. These functions rely on the fileStorageModel to perform CRUD operations (in this case, create, read and update) for the in-memory data structure in the data dir

For isolation and modularity, continuing from the previous milestones, the front-end is broken down into source, eventhub and services.

Updates were made to the Sell page to allow users to post/sell storage spaces. Consequently, the user page was reflected with the new storage spaces.

Using StorageListingService, StorageListingRemoteService and EventHub, whenever a new post was added or the user updated it by listing it, an appropriate HTTP request (GET, POST, and PUT) was made to the back-end.

Simran Lekhwani

Front-end Implementation and Back-end Implementation:

During this milestone, I extended the back-end to support the storage page functionality and selling of storage spaces by adding two new endpoints: `‘/v1/storage/listings’` and `‘/v1/storage/listings/:id’`. For the data aspect, I created a `FileStorageModel` that allowed me read and write in the in-memory structure (`storage.json`), which aided in supporting the actions implemented in `storageController.js` - load all the current listings (GET), add a new item (POST), update an item (PUT) to mark it as listed. If any error was encountered, a 400 status message was sent in the response or it was handled by the middleware in the case of an internal error.

On the front-end, I enhanced the `SellComponent` by introducing two buttons that render different forms based. If the item button was clicked, the post was handled by the buy component, but if the storage button was clicked, a `AddStorageItem` event was triggered which was handled by the `StorageListingService` and `StorageListingRemoteService` to make an appropriate HTTP request to the `/v1/storage/listing` endpoint. Similarly, on the user page, when the user listed these posts, it would update the listing to mark it as sold and populate on the page. The new listings were updated both on the back-end and in `indexedDB` to allow both persistent storage and offline-access to the loaded listings for the user.

Simran Lekhwani

Challenges and Insights

- Some of the challenges I faced was in setting up the server itself. I was initially using the Express 5.0 version which had different rules for processing routes expression compared to the previous versions of Express. For this reason, it would often throw syntax errors. Once I realized this, I downgraded to a more compatible version. This was a great learning experience in my opinion as it highlighted the consequences of working with breaking version, beta versions and how it can affect your collaboration with others who might not be using the same versions.
- Furthermore, the modularity and isolation provided from the structure of the back-end and front-end made it extremely easy to work with others as my work didn't interfere with theirs, which made it easier to handle merge conflicts in my experience.

Simran Lekhwani

Future improvements & next steps

Pop-up modal for the Storage Listings:

<https://github.com/umass-byrneb/CS326-Group-36/issues/67>

- Allows the user to click on a particular listing to view it was a pop-up modal on the screen, which would have the additional information of the items they could potentially store.
- This would be a new feature which would require some server design changes.

Classification of Storage Items on the user page:

<https://github.com/umass-byrneb/CS326-Group-36/issues/68>

- On the user page, have a separate view for non-storage items and storage items so that the users don't get confused while listing them. Both items and storage spaces cannot be listed together because of their different routes/endpoints.

Potential Efficient Server Design:

<https://github.com/umass-byrneb/CS326-Group-36/issues/69>

- Currently, when a user creates a post, it populates in the respective buy or storage data structure and it is later updated when the user lists it. However, this could be misleading when loading the data from these structures, so a more cleaner approach could be to have a userSell structure which could list all the items the user wants to sell/rent and when they do post it, we populate in the respective buy or storage structure.