Documentation

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https://github.com/Pouya-Abikari/SEPP_Prototype

What was accomplished:

For this project, we created an application that simulates real-world interactions and activities of students within a shared living accommodation. Our main goal was to create a feature that would help students save on delivery costs, positively impacting their student expenses.

Our SSH App effectively mirrors daily scenarios through the use of threading and user-driven functionalities, offering a seamless and engaging user experience. Key features of the app include a dynamic messaging system, live notifications as well as a solo and group grocery ordering system. The messaging system uses automated responses to simulate real-life group messaging, while live notification provides updates on orders, enhancing user experience.

Students can effortlessly interact within the app to create or join group orders. They can also place solo orders if wanted. The app features allow users to manage items by adding or removing them, adjusting quantities, and choose their preferred payment methods (cash or card). Additionally, users can update their location, search for specific products, as well as view delivery and total costs. Discounts for selected items are applied accordingly, accurately reflecting in the order summary.

Discusses in detail how it was accomplished:

1. Project management:

At the start of the project, we followed the EDR created by Ekaterina, which served as a guide, outlining the projects structure, description and milestones. The EDR ensured that the project followed the needed core objectives and goals.

We alsobuilt upon the initial EDR, by introducing additional functionalities, such as a solo order feature, which was not included in the original plan. Key elements from the EDR, such as a 1 hour time cap, a 10 people maximum limit, and other design aspects were successfully implemented.

To facilitate collaborative work for this project, we set up an IntelliJ project linked to a GitHub repository, adding our group members, which enabled simultaneous contributions from multiple

devices. This allowed us to push updates and review each other's changes seamlessly, significantly enhancing our teamwork.

We adopted the incremental development model, dividing the project into smaller part, ensuring that each part works well before moving onto the next part. Planning began with Figma designs, which provided a clear blueprint for coding the app's pages. Each feature was implemented, tested, and improved based on feedback from the group members and the professor.

Task Allocation:
We divided the needed tasks equally among team members:

- **Nazanin** mainly handled the Cart and Location pages.
- **Pouya** focused on the Menu page.
- **Ekaterina** worked on Messages, Notifications, Homepage, backend of Signup and the Signup successful pages.
- **Amir** handled the Settings, Login, forgot password pages and front end of Signup.

Despite these allocations, we all collaborated and assisted each other across all the pages, fostering teamwork and ensuring everyone was involved in the tasks at hand.

Handling and Communicating Changes:

- Regular updates and progress discussions during group meetings ensured alignment.
- Issues like GitHub conflicts or IntelliJ runtime problems were addressed quickly by brainstorming together and assigning troubleshooting tasks.
- Feedback from the professor was prioritized, leading to iterative improvements in design and functionality.

2. Software Engineering Techniques:

We chose JavaFX as our framework, since we are all very familiar with its functionalities and how to work around it. We maintained a straightforward structure, assigning each app page its own controller class and FXML file. Resources such as images and design elements were organized within the resource folder. To ensure visual consistency and aesthetical appeal, we followed a uniform style, using consistent font sizes, colors and symbols throughout.

We made use of version control via GitHub, where all the code was regularly committed and pushed by each team member. This allowed for tracking each others changes and helped us implement dependency management, ensuring that all required libraries and frameworks were accessible to every member.

We used testing to verify that all of our existing features worked as intended after each development cycle. For example, input validations were tested on the Sign-Up and Log-In pages to ensure error messages displayed correctly under certain conditions. Features such as

group/solo order toggles and cart updates were tested to ensure they worked seamlessly with other app components through Intergation testing. Although we didn't implement advanced Continuous Integration workflows, we simulated a similar process by frequently merging updates and performing manual reviews of pull requests.

3. Technical Accomplishment:

The Sign-up page enables users to create accounts. Upon successful sign-up, the user's information is stored in a text file "users" that acts as a database. Upon login, the user's details are saved in a "current user" text file. The homepage accesses this file to extract and display the logged-in users name. Accounts are created by adhering to the following specific rules:

Condition:	Error Message:
If any field is empty	"All fields are required."
If the email contains any special characters apart from @	"Invalid email format."
If passwords length is shorter than 6	"Password must be at least 6 characters."
If the two passwords aren't the same	"Password and confirm password must be the same."
If the email already exists in the database	"A user with this email already exists."

The messaging page uses threads to simulate a real-time conversation, offering an engaging user experience. To simulate the natural pauses between replies in real-life conversations, threads and a 0.5 second sleep function were used for each automated response. A special case arises with the input "should we start a shared group order?". After displaying automated replies, the messaging system displays a clickable message with a link that allows users to initiate or join a group order, further mincing real-life scenarios. Specific inputs trigger random replies from predefined arrays, as shown below:

Input:	Random reply options:
"hi"	"Hi!", "Hello!", "Hey there!"
"hello"	"Hello!", "Hi!", "Greetings!"
"how are you"	"I'm good, thank you!", "Doing great!", "Im fine, you?"
"what is your name?"	"I'm Cassie", "Your house mate here!", "Josh!"

"bye"	"Goodbye! Have a nice day!", "See you later!", "Take care!"
"should we start a shared group order?"	"Yes!", "For sure, lets do it!", "I will join", "Yes! Send the link."

The use of threads was also crucial for the Notifications page. To simulate real-life notifications, we added a 1 second sleep function, introducing realistic delays between notifications. For example, notifications progress sequentially from "Order Confirmed" to "Order Out for Delivery" to 'Delivery Complete". This approach mimics real-world notifications.

The Menu page features a search bar to quickly find items from an items text file and displays 10 product categories (e.g. "Dairy"). Each category contains 10 items with dynamic pricing and discounts. Clicking "Add to Bag" updates the cart count in real time and writes the product to the cart text file, which is later used to display the items in the cart. Additionally, the search bar integrates with a search text file to load product details like pricing and discounts.These features create an interactive and user-friendly menu experience.

The Cart page manages user carts through a cart text file for solo carts and a shared group cart text file for group orders supporting adding/removing items, adjusting quantities and dynamically updating group cart details. A toggle button allows seamless switching between solo and group modes, enabling users to either join or create group orders or proceed with a solo order. A 1 hour count timer ensures timely group order completion. Delivery fees are dynamically calculated and either split among group members or applied solely to the solo order. Robust error handling is implemented for missing files, invalid inputs, and cart expiration to ensure a smooth user experience.

Additionally, JavaFX was utilized for its robust UI design capabilities, simplifying the creation of interactive app pages. Java's Thread and Timer classes were employed to implement real-time messaging, notifications, and countdown timers.

Some challenges we overcame were addressing data consistency between files was a significant obstacle. For example, ensuring synchronization between the cart and group cart text files required rigorous testing and validation.

Ekaterina Alekseeva's Reflection:

- **Reflections on Nazanin Montazeri:** I thoroughly enjoyed working with Nazanin on this project. She was an exceptional team member, consistently providing valuable support and contributions. When I encountered an issue with the signup page that I had been struggling to resolve for over four hours, Nazanin sat with me for an hour to debug the issue. Her problem-solving skills were very helpful in resolving the issue together, showcasing her dedication to teamwork. Nazanin's passion for the subject and her deep understanding of coding was evident throughout the project. She consistently suggested positive improvements, helping to refine our work. She tackled the menu page very professionally, dedicating significant time and effort to ensure good functionality. It was one of the most challenging tasks in our project and she compelted it with ease and determination. Additionally, communication with Nazanin was always effortless. She actively participated in every group meeting and always answered any messages about the project throughout the week. Working with Nazanin was truly a pleasure, and having her in our team significantly enhanced the quality of our project. Her teamwork skills and input really impacted us towards a positive direction.

- **Reflections on Pouya Abikari:** I can confidently say that Pouya has been such a valuable member in our group project. In the beginning, we unanimously decided that Pouya would be our group leader. Even though we all lead and supported each other, constantly collaborating and sharing ideas, Pouya stood out by effectively splitting tasks and designating different aspects of the project to everyone. This ensured an equal and efficient distribution of workload. As the group leader, he took responsibility for managing the Github repository, ensuring that all our work is accessible by the team. Pouya also ensured everyone was aware of their roles and deadlines. At the start of the project, he took inspiration from my initial Figma App design and developed it into a polished final model, which we all used as the foundation when coding our pages. Pouya also tackled some of the most challenging functionalities in the, including the solo and group ordering systems. Throughout the project, he provided constructive criticism and valuable feedback, always aiming to elevate the quality of the project. Beyond his technical skills, Pouya displayed exceptional leadership qualities, motivating everyone to contribute their best. His passion and ambition were clearly evident in every task he undertook. He is undoubtedly a very talented and hardworking individual, and it was a privilege to have him in my team.

- **Reflections on Amir Kazemkhani:** Amir was a very respectful and kind teammate who consistently proposed different solutions and workarounds whenever we encountered issues. He brought a positive mood and energy to the group, which was highly appreciated. Amir was always quick to respond to any queries or updates related to the group project or tasks, even during weekends. He successfully completed the settings

page with ease and made significant contributions to the frontend design of the login, forgot password, and signup pages. I then took responsibility for the backend logic and cleaned up some elements. For the future, I would recommend that Amir focus on being more productive with his tasks, as I believe he has the potential to achieve much more and could have helped us finish the project faster. Additionally, I wish he had contributed more to the larger, more complex tasks that the group tackled. Overall, Amir was a valuable member of the team, and I look forward to seeing his growth and involvement in future projects.

Nazanin Montazeri's Reflection:

- **Reflections on Ekaterina Alekseeva:** Ekaterina was very hardworking and made significant contributions to both the front end and back end of our project. We started by using her EDR and Figma design, which gave us a strong starting point. Her ideas and skills greatly improved the app's design and functionality, making it look and feel much better. In addition to her work on the app design, she implemented the messaging and notification system using threads, which was a challenging task that she managed to complete effectively. She was always supportive and willing to step in where needed. When we faced a major backend issue that required a lot of time to fix, she took on other tasks, helping to resolve smaller problems so we could focus on the main issue. Her contributions were invaluable throughout the project.

- **Reflections on Pouya Abikari:** Pouya was an excellent team leader who dedicated a great deal of time and energy to the project. He made significant contributions, particularly with the complex backend logic, such as implementing the cart and group ordering features. His leadership skills were outstanding—he managed to guide the team effectively without making anyone feel pressured or uncomfortable. Pouya excelled at dividing tasks in a fair and organized way, ensuring everyone knew their responsibilities. Moreover, he was always ready to step in and help resolve issues, offering support whenever it was needed. His balanced approach to leadership played a crucial role in the success of our project.

- **Reflections on Amir Kazemkhani:** Amir was a respectful and encouraging team member who brought a positive attitude to the group. He contributed to the project by working on the settings page and parts of the signup page, both of which were helpful additions. However, there was room for him to be more involved and to dedicate additional time and effort to the project. With greater engagement, his contributions could have had an even bigger impact.

- **Reflection on Ekaterina Alekseeva**: Ekaterina brought a creative and strategic perspective to our team, particularly in her work on the immersive chat design and the integration of group ordering features. Her ability to innovate while staying aligned with the team's goals made her contributions invaluable to the project. Ekaterina's work on the chat functionality was not only technically sound but also highly engaging. The messaging system she developed, while not using real-time threading, creatively demonstrated the prototype's capabilities through automated responses and sequences of realistic group interactions. For instance, when a user sent messages like "should we start a shared group order?", the system displayed an interactive button linking directly to the group ordering page. This feature—originally proposed by Amir, refined through my guidance, and executed seamlessly by Ekaterina—enhanced user engagement with our app's core functionality. Ekaterina also played a key role in synthesizing ideas from the team, particularly when integrating her work with Nazanin's shared ordering logic and Amir's login and settings pages. Beyond technical contributions, her balanced approach to problem-solving and documentation ensured that the team maintained focus while adhering to the broader goals of the prototype. If I were to suggest an area for growth, it'd be encouraging Ekaterina to explore more advanced technical implementations. While her solutions were highly effective for demonstrating the prototype, deeper exploration into threading or live data synchronization could elevate her already impressive skill set further. Ekaterina's creative problem-solving, collaborative spirit, and dedication to delivering polished results significantly elevated the quality of our project. Her ability to align her work with team objectives ensured a cohesive final product, and I am confident she will continue to excel in future collaborative endeavors.

- **Reflection on Amir Hossein Kazemkhani:** Amir was an indispensable team member, consistently contributing innovative ideas and aligning his work with the app's core functionality. His proactive approach and strategic thinking were instrumental in addressing challenges and enhancing the project's overall success. Amir demonstrated exceptional foresight by proposing the interactive "Click here for group shared order" feature in the chat. This idea, which Ekaterina implemented, significantly increased user engagement with the shared ordering system, aligning closely with our EDR goals. Amir's vision ensured this feature became a key highlight of the app. Amir also supported me and the team during high-pressure moments. When live threading was introduced late in the project, he proactively researched and prepared placeholder code to simulate simultaneous user activity. This initiative provided the team with a critical starting point and showcased Amir's ability to adapt and assist beyond his immediate responsibilities. Additionally, Amir's work on the login, forget password, and settings

pages established vital infrastructure for the app. These components ensured seamless transitions into shared ordering and address features, reflecting his technical precision and commitment to integrating his work with the app's broader goals. Amir's efforts were outstanding. To further enhance his impact, focusing on prioritizing high-value tasks could amplify the strategic value of his efforts. Amir's technical expertise, problem-solving initiative, indefatigability and collaborative spirit made him an invaluable asset. His contributions, from supporting threading functionality to proposing core features, were pivotal to our prototype's success and exemplified his potential as a highly effective team member.

- **Reflection on Nazanin Montazeri:** Nazanin's contributions were essential to the success of our project, particularly in her handling of the shared group ordering functionality. Her ability to translate abstract requirements into practical, functional systems was a major factor in the app's development. She consistently brought a meticulous and thoughtful approach to her work. Nazanin's efforts were central to ensuring the shared ordering system operated smoothly. She worked closely with both Amir and Ekaterina to align various components, such as the interactive "Order Now" button triggered in the chat, with the core group ordering logic. This feature, which originated from Amir's proposal and was developed collaboratively, exemplifies how Nazanin integrated technical insights with team input to create a standout functionality. Nazanin's relentless drive to resolve technical challenges stood out throughout the project. Her commitment often extended beyond normal hours, where she demonstrated an impressive ability to stay focused on solving critical issues. Her attention to detail was especially valuable during the testing phases, where she consistently ensured that edge cases were accounted for. If I could offer one suggestion, it would be for Nazanin to step back periodically during high-pressure situations. While her determination is one of her greatest strengths, allowing herself moments to recharge could further enhance her problem-solving capabilities and overall efficiency. Nazanin's work ethic and technical proficiency were vital to achieving our project's goals. Her ability to collaborate effectively and her commitment to quality set a high standard for the team, and I am confident she will continue to excel in any future challenges.

Amir Kazemkhani's Reflection:

- **Reflection on Nazanin Montazeri:** Nazanin was a cornerstone of our team's success, particularly with her work on the shared group ordering functionality, the core feature of our prototype. Her ability to break down technical requirements into actionable solutions ensured the group ordering system functioned seamlessly. Nazanin and I collaborated through Pouya, our manager, to ensure smooth interconnections between sections of

the app. For example, while I worked on the login, forget password, and settings pages, I coordinated with her to enhance the shared ordering experience. These pages served as entry points for users to access shared carts and adjust payment methods. Nazanin also worked closely with Ekaterina to align the shared ordering functionality with the immersive chat design. For instance, the interactive "Click here to start group" button when someone writes "should we start a shared group order?" in the chat —a feature I initially proposed, refined by Pouya, and implemented by Ekaterina—relied on Nazanin's group order logic to function seamlessly, boosting user engagement. Her dedication to problem-solving was unparalleled. She consistently tackled challenges with focus, ensuring critical issues were resolved effectively, inspiring the team's perseverance. Nazanin's technical expertise, collaborative spirit, and proactive approach were integral to the project's success. Her ability to tackle challenges head-on elevated our team's output, and I am confident her dedication will make her an invaluable teammate in any future endeavors.

-**Reflections on Pouya Abikari:** Pouya's leadership as our team manager was the cornerstone of our project's success. His ability to take on multiple responsibilities, provide structured guidance, and inspire confidence ensured that the team remained focused on delivering a high-quality prototype. Pouya consistently led by example, taking on a significant workload while also facilitating collaboration among team members. For instance, when our professor introduced the requirement for threading to simulate simultaneous user logins for the shared group ordering system, I proactively prepared placeholder code to support Pouya in implementing this critical functionality. Despite the added pressure, Pouya successfully integrated threading into the app, showcasing his technical expertise and leadership in managing high-stakes tasks. He also ensured that individual contributions, such as my work on the login, forget password, and settings pages, were seamlessly integrated into the broader project. His clear communication and structured approach provided a framework for connecting features like shared cart access, live timers that sync between 2 users simultaneously, and usage of threads for a very extensive prototype, exceeding standards. Pouya's leadership extended to refining ideas and guiding their execution. For example, in the development of the "Click here to start group" button in the chat, I proposed, Pouya refined the idea and coordinated with Ekaterina for its implementation, demonstrating his ability to align team efforts. Pouya's ability to manage multiple responsibilities, support team members, and maintain focus under pressure was a driving force behind our success. His leadership will undoubtedly continue to make him an asset in any collaborative setting.

-**Reflection on Ekaterina Alekseeva**: Ekaterina's contributions were pivotal to the success of our project, particularly her work on the immersive chat feature and her expertise in integrating multiple EDR strengths. Her focus on usability and her attention to detail ensured that the app's core functionality, shared group ordering, was both engaging and intuitive. Ekaterina demonstrated exceptional creativity in designing the chat feature. To showcase the shared ordering functionality at a prototype level, she devised an innovative method where specific user inputs, such as "should we start a shared group order?", would trigger automated replies and an interactive button for

initiating a group order. This feature, initially proposed by me, refined by Pouya, and implemented by Ekaterina, helped emphasize the app's primary EDR goal of shared ordering functionality. Her ability to combine strengths from different EDRs stood out. The EDR summary highlighted essential features like time caps for shared orders and participant limits which were instrumental in shaping the app's development. Ekaterina's unbiased approach ensured that the prototype met all objectives cohesively. Ekaterina was also highly collaborative, working closely with Nazanin to integrate shared order logic into the chat design and ensuring seamless functionality. Her focus on clear documentation and technical alignment enabled smoother communication among the team and contributed to the app's overall success. Ekaterina's creativity, problem-solving skills, and collaborative spirit were integral to the project. Her innovative thinking enhanced the user experience. I am confident that her ability to integrate diverse ideas will continue to make her an invaluable team member in any future project.