2022 S1C INFO2222
Project Report
Usability part

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Summary

Summary of technology stack:
Front-end: Vite + Vue3.0 + VueRouter 4 + TailwindCSS + HeroIcons
        CDN library: axios + SweetAlert2
Back-end: Python + Flask
        Database: Sqlite

Contribution:
    Step1: User Investigation.
        Lavender : Distribution of survey, done the analysis including: PACT analysis and generated Persona.
        Tom : design the survey and distribution of survey.
    Step2: Navigation design.
        Tom: Generated priority table, Completed 4 card sorting and a sitemap.
        Lavender: participated in card sorting.
    Step3: Design-Evaluate.
        Tom: designed and drawn prototypes and completed the test of the prototype.
        Lavender: designed and drawn prototypes. Participated in guerrilla test
    Step4: Design-Evaluate (Hi-Fi Prototype).
        Tom: Developed the comment function and some admin delete function.
        Lavender: Developed the forum part except comments.
    Step5: Final report. Tom and Lavender together.

LifeCycle:

Project cycle

This lifecycle shows the all steps and deliverables in our project
and how many iterations we have done.

01 Requirements --
step1 : User Investigation)

1. chosen target group
2. done a survey to learn demand of target user
3. done a PACT analysis
4. created a persona document

02 Requirements--
Step2 : Card Sorting part

1. generate functions
2. opened and closed card sorting first time
3. Analysis the result to improve functions.
4. Repeat above 2 steps
5. generated a sitemap

03 Design--
Step 3 : Design-Evaluate

1. A prioritized list
2. Outline how to find best design
3. created prototypes
4. done guerrilla tests
5. analyzed data
6. created improved prototypes

04 Iterations--
Step 4 : Design-Evaluate

1. initial work
2. iteration1: Achieve create post and show post list function demand.
3. iteration2: Achieve view post details function demand.
4. iteration3: Achieve comment post function demand.
5. check outcomes

05 Step5 :Final report

1. combined informations
2. done report

Body of report

Step1: User Investigation.

We created a form through google docs and separated the survey through social media to attract the users to do our survey. In total we set six questions including the survivors' age, identity, "How many hours do you usually spend on study per day?", "What device do you normally use to access a learning website?", "What are the most important features for a learning website?" and "What features do you specifically need for a learning website?". These questions are helpful for us to search about target user characteristics and let us know the users' needs.

In total, we got thirty survey replies. Through the data analysis, our website target users are students and their age range is from 18 to 21 and from 22 to 25. The majority spend 5-7 hours per day studying and nearly all use the desktop to access learning websites. And we got the target users that need the most features are "Easy to search information" and "Sharing useful materials or ideas".
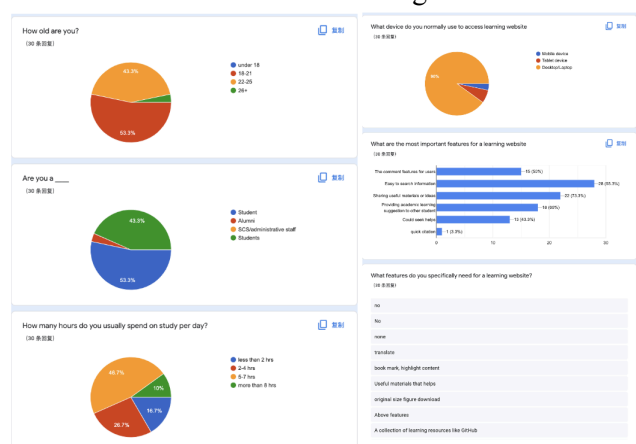
Persona：
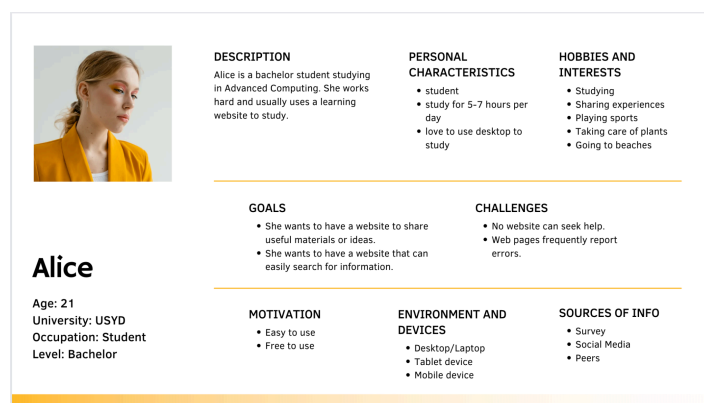
PACT analysis
The PACT analysis stands for People, Activities, Contexts, and Technologies which is a useful framework for thinking about human centered design.

1. People
   Through the survey, the target users for our website are students who most need to learn experiences and seek the necessary help. The website is used for academic studies, and also needs to attract alumni or administrative staff to use the website to share experiences and knowledge with current students.

The age range attracted by the website are from 18 to 21 and from 22 to 25.Because these age groups are the common age of students. The minority users' ages are more than 26 who are mostly alumni or administrative staff. Our website needs to cater for different age range users' needs.

2. Activities

The website activities can separate into two parts: messaging and forum.

Messaging:

The user can add friends, delete friends, and send messages to friends. These used to communicate between student and student or if some students have specific questions they can ask relative staff or other people to seek the help.

Forum:

The user can create posts, view posts, comment posts and share documents. These used to seek necessary help and share experiences. The users can through comments to answer post user questions or give some suggestions. Also the users can create a post to share materials and experiences about some courses. And so on activities about academic studies.

Additions activities belongs to "admin" user:

The admin user has some permissions to control the users and posts. The admin can delete the user account and delete all the posts regardless who posted compared to normal users who can only delete their friends who added before and the posts which they posted.

3. Contexts

For all activities found in the activities analysis, there are several contexts that all of them shared as shown below:

    a. Can run the website on different equipment which has browsers including PC, phones and Ipad.

    b. All activities can be done anywhere indoors or outdoors. When indoors, to prevent eye discomfort, the screen brightness of the device should not be too high; when outdoors, in order to facilitate the viewing of web page content, the screen brightness of the device should be moderately higher than the environment.

    c. The website is designed for single users to use, the users will not be affected by the organizations or others environment influenced.

Each activity with their own unique contexts are as shown below:

Messaging:

- Only the user login the account and then can do the operations about the messaging.
- The users need to add at least one friend and then can communicate with them.
- The users can delete friends only when they have friends currently.
- The users can add friends only when the friends account exists.
- The user's friends list and communications contents are private which means other users cannot see them.

Forum:

- Only the user login the account and then can do the operations about the forum.
- The users' operations' permissions will be influenced by the admin account.
- The users can send posts or comments when it doesn't mute by admin account.
- The users' posts will be influenced by the admin account, who can delete all the posts.

4. Technologies

input:

- The users use the mouse to click the website button.
- The users use the keyboard to type in the text area.
- The users use the local files to upload documents.

output:

- The website shows on the browser regardless of what browser.
- The website uses different colors to show the different types of content.

Step2 Navigation design

First times

Cards: About, Message box, Register, login/logout, change password, change profile, setting, notification, helps, switch accounts, forget password, add friend, remove friend, send message, Create a post, search, upload document, comment the post, delete a post, delete a document.

Card Sort Open 1:   **Card Sort Closed 1:**

Card	Sorted into	Categories	Frequency
About	4 categories	Home	4
		Main Page	2
		Home/main page	1
		account	1
Add Friend	2 categories	Friend	6
		Friends	2
Change password	3 categories	Account	6
		log in	1
		User account	1
Change profile	3 categories	Account	6
		User account	1
		profile	1
Comment the post	3 categories	Post	5
		Forum	2
		account	1

The results matrix

	Home	Account	Friend	Forum	unsorted
About	7	2		1	
Register	5	4		1	
Message box	3	2	3	2	
log in/log out	4	5		1	
change password		9		1	
change profile	3	7			
setting	4	6			
notification	4	4		2	
switch accounts	3	7			
add friend			10		
remove friend			10		
send message		1	5	4	
Create a post				10	
delete a post	1	1		8	
upload document	2	3		5	
comment the post	1	2		7	
delete a document	1	4		5	
search	6			4	
forget password	1	8		1	
helps	7	1	1	1	

Example (More in appendix)   *Example2 (More in appendix)*

Through the data analysis of card sorting open, we can find:

Result:

Categories	Functions	Result
Home(Main page)	About	87.5%
Friend(Friends)	Add Friend	100%
Account	Change password	75%
Acount(Post)	Change profile	75%
Forum(Post)	Comment the post	87.5%
Forum(Post)	Delete a document	75%
Forum(Post)	Delete a document	75%
Forum(Post)	Delete a post	87.5%
Account	Forget password	62.5%
Home(Main page)	Helps	62.5%
Home(Main page)	Login/logout	62.5%
Home(Main page)	Message box	62.5%
Home(Main page)	Notification	75%
Home(Main page)	Register	62.5%
Friend(Friends)	Remove friend	100%
Forum(Post)	Search	62.5%
Friend(Friends)	Send message	87.5%
Account(User account)	Setting	75%
Account(User account)	Switch account	87.5%
Forum(Post)	Upload document	75%

Analysis of card sorting close:

Participants were vague about the classification of the register, message box, login/logout, notification, send message, delete a document.

Comparison:

We can find that the participants have basically the same classification of cards, namely home, forum, account, and friends.
However, we also found that the classification of participants in register, message box, login/logout, notification, is relatively vague.
Therefore, in order to allow participants to classify the cards more clearly, we made simple modifications to the cards. For example, delete the message box, because this card has a certain overlap with the notification card. Split log in and log out so that they belong to different categories. And rename the card to make it easier for participants to understand the function of the card.

Card sorting Open 2

Second times

Cards: About, Register, login, logout, change password, setting, notification, help, switch accounts, forget password, add friend, remove friend, send message to friend, Create a post, search information, comment the post, delete a post.

About, register, login, notification, help, switch accounts

Home, <- Friend <- Forum, account <- admin

About	5 categories	🗁 Home	4
		🗁 Login Page	1
		🗁 Account	1
		🗁 setting	1
		🗁 setting page	1
Add friend	3 categories	🗁 Friend	5
		🗁 Friends	2
		🗁 contact	1
Change password	3 categories	🗁 Account	6
		🗁 log	1
		🗁 setting page	1

Example3 (More in appendix)

Card Sorting Closed 2

	Home/Main Page	Friends	Forum	Account
About	6			1
Register	4			3
Login	7			
Logout	1			6
change password				7
setting	2			5
notification	1	1	1	4
help	5		1	1
switch account	1			6
forget password	3			4
add friend		7		
remove friend		7		
send message to friend		6	1	
Create a post			7	
search information	3		4	
comment the post			7	
delete a post			7	

Example4 (More in appendix)

Comparison:

Through the data analysis of card sorting, we can find:

By analyzing the second open and closed card sorting, we found that we have the same idea in the following sections same: about(home), add friend(friend), change password(account), create a post(post/forum), delete a post(post/forum), help(home), log in (home), log out(account), notification (account), register(home), remove(friend/friends), search information (post), send message to friend(friend), setting(account), switch account(account),

But there is also a vague part: forget password(home, account)

We believe that the "forget password" should be placed in the log in part of the home page. So that if the user forgets the password, he/she can still retrieve his password through the registered email information. The account page is an interface only available after the user logs in, so if users forget their password, they should not be able to enter the account page.

After two iterations of card sorting, we generate a sitemap from the conclusions
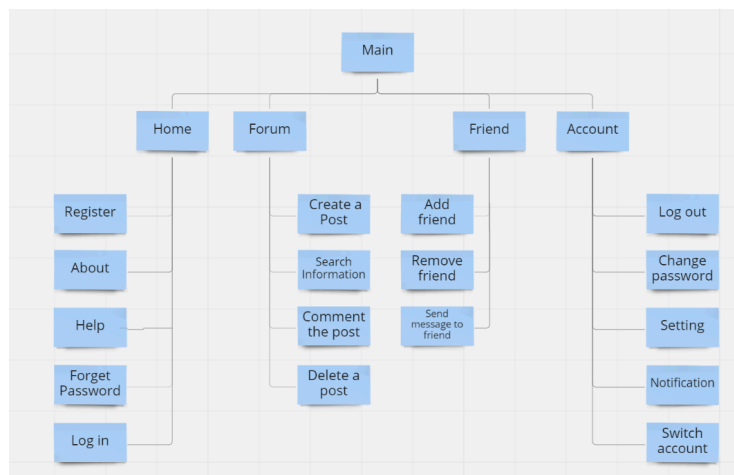
Step 3 Design-Evaluate

Prioritized list

| Page	Function Name	Priority
Home	Register	0
Home	Login	0
Account	Log out	1
Friend	Add Friend	2
Forum	Create a Post	2
Forum	Comment the post	3
Friend	Send message to friend	3
Forum	Delete a post	4
Friend	Remove friend	4
Forum	Search information	5
Home	Forget password	6
Acccount	Change password	6
Acccount	Switch Account	6
Home	About	7
Home	Help	7
Account	Setting	7
Account	Notification	7

Detailed in appendix

Steps to determine "best" prototype:

1. Generate sketches based on sitemap.
2. Apply Design Principles Visibility, Affordance, Feedback, Constrains, Consistency and mapping to sketches.
3. Apply Design Guideline to improve sketches
4. Apply Design rule to improve sketches.
5. Apply Accessibility WCAG principle Perceivable, Operable, Understandable, Robust to improve sketches.
6. Consider the human factors to improve sketches.
7. Generate the final sketches.

original sample lo-fi (more in the appendix url):
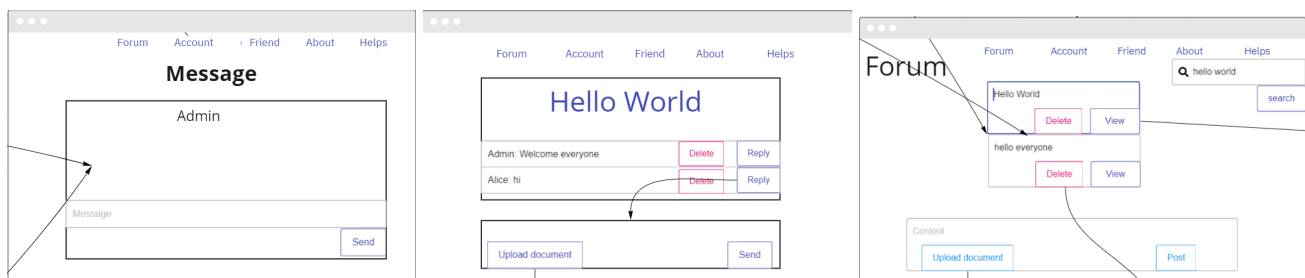
After iteration sample lo-fi (more in the appendix url):
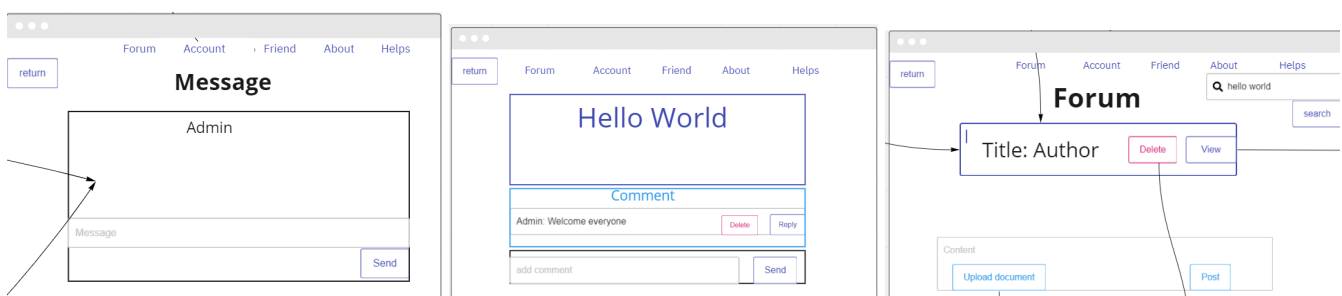
Return button   *Layout return changed*   *Layout return changed*

Test1:
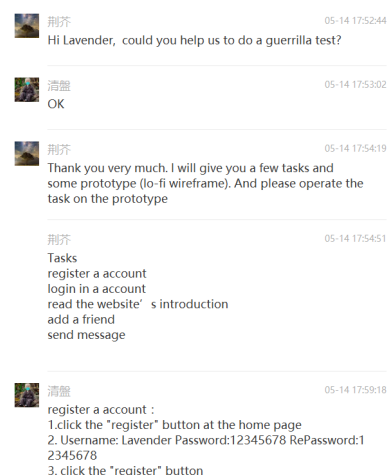
Task	Priority
Register a account	3
Login in	3
Read the website's introduction	1
Add a friend	2
send message	2

Because our team members are not in the same city, we performed the guerrilla test through Wechat. The step is that member A proposes the task, then member B makes a decision based on the existing prototype, and then member A returns the corresponding prototype diagram.

In the first guerrilla test, we mainly tested the home and friend categories, and the tasks were in the above table, and then the suggestion we got was to add a return button so that the user can easily return to the previous page.

We think this suggestion is good, so we add return buttons to all pages.

Test2:

Task	Priority
create a post	3
comment the post	3
Delete a post	2
search information	2
anything else you like	1

云玖❤️
Ok. I think done.

不知不觉
No problem, how do you feel it? and Do you have any suggestion?

云玖❤️
I am not admin, why show me the "delete" button and then tell me I can't delete. 🙈 I think maybe you can hide "delete" button. And only shows when I am admin.

不知不觉
Great idea, do you have any other suggestions?

云玖❤️
Nope

不知不觉
Thank you very much for taking the test

云玖❤️
No thanks
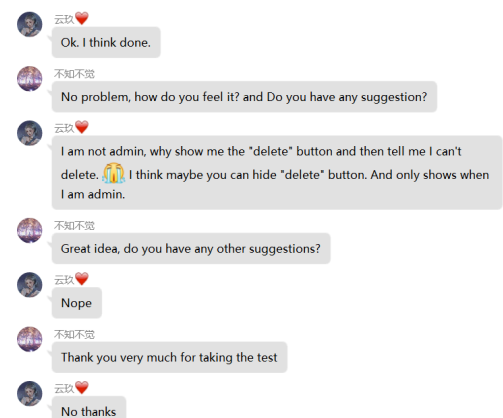
Sample guerrilla test2

In the second test we asked members all questions about the table above. The advice we got was to keep the delete admin function hidden from normal users.

The delete function is visible to normal users and it may cause some misunderstandings. Meanwhile, we feel that it is necessary to separate the admin interface from that of normal users, so as to ensure that different users have a better experience.

Moreover, Also, we felt we needed to change the layout of the forums and comment pages based on the better experience. For the Forum page, after we remove the delete function, we think we could add the author of the post on it, which may allow the user to quickly find the post of the author he likes. For the Comment page, we believe that the previous comment and content placed under the same box may cause the post content to be covered by the comment or divert the user's attention. In this regard, we separate the three parts of content, comment and create, so that each part does not affect each other. In this way, users can understand the various functions of the comment page more intuitively.

Furthermore, we also conducted a third test on the tutorial, in this test. The tutor let us explain the various functions of our website and the interaction between each page and how to use each function. Tutor thinks that our prototype map is very complete, including our functions on the sitemap. The tutor suggested that we hurry up and materialize the above prototype diagram.

Step 4 Design-Evaluate

Iterations: During this development process, we carried out a total of third iterations.

Initial development: We changed the page structure based on the project security part code. In the last period, when we login successfully, the page will directly jump to the "Friend" page. Currently, we need to have messaging and forum two main functions. Thus, we finally decided to develop a new homepage after login, which includes "Messaging", "Forum" and "About" three buttons. The user after login can choose to go to message or look through and comment posts.

First time iteration: Achieve create post and show post list function demand.

Plan: For the forum, the first requirement is that users can create a post. Thus, we plan to develop a post function at first. Our plan is that users need to input the post title and post content, and then the post will be saved to the server and all the users can see this post. All the posts will be shown as a post list. Thus, based on the thoughts, our design is to develop one page which includes two parts: posts list area and create post area. The top half of the page is the posts list area, it will show each post like a card. The card will include the post title, the post creator. The below half of the page is the create post area, it includes four parts: post title, post main content, upload file area and create button. And for the admin, it has the permissions that can delete the post. Design a button at the right of the card.

Development: After designing and drawing the prototype, we started to develop this demand.

We firstly developed the below half page for the create post function. For the front end, we used one label to show "post title" text, one input to let the user input the post title, one textarea to let the user input the post content, one file type input to let the user upload the file and one button to let the user submit the post. When the user input is finished and clicks the "create post"button, if created successfully, there will be a popup. For the back end, we used the dictionary to save the post, set id for each post and then save "id:(title, content, creator)".

And then we developed the above half page for the posts list. For the front end, we created a component called postcard to show each post. Using the component can make the list show easily. Each card includes the post title, post creator. For the back end, we just need to provide one API to return all the posted information to the front end.

For the admin, the front end adds a button on the postcard, which sets the "delete"button to show when the user is admin. When clicking the button, the back end will remove the specific post information from the server.

Second time iteration: Achieve view post details function demand.

Plan: After iteration1, we did some tests to get reflections from the user. From users' feelings, we need to show the posts details about the content, the current version is not integrity. Thus, we plan to show the post details in this iteration. We plan to create a new page to show, which includes the post title, post creator and post content. And we plan to jump to this page from the posts list, in our prototype, we added a button on the posts list. And we plan to let the user return to the forum page from the view page by a button.

Development: After designing and drawing the prototype, we started to develop this demand.

Front end: Firstly, we updated the postcard component, we added a "view" button to each card which let users jump to the view page through this button. And then we coded the new

page about view details. The view page includes the post title, post content and post creator. We also created a "return" button at the left-top corner when clicking the router will jump to the forum page.

Back end: The back end provides the selected post information to the front end including title, content and creator name.

Third time iteration: Achieve comment post function demand.

Plan: After iteration2, we did some tests to get reflections from the tester. From testers' reflections and preliminary user needs surveys, we think the forum always has the comment function, so we also need this function in our product. We plan to at the view post page to add the comment function. The page will be divided into three parts: post content, comments, and create a new comment.

Development: After designing and drawing the prototype, we started to develop this demand.

Front end: Firstly, we seperated the page into three areas, set the height and width and set the overflow auto. And then for the post content part, it was the same as the last version, we don't need to update. For the comments part area, we need to get the comments from the back end and shows in this area. For the create new comment area, we developed two parts: a textarea to type in comment content and a button to submit comments.

Back end: Provide API that can let the front end get all the related comments. And can save the newest created post into the server.

Outcome: seen in appendix

Appendix:

Before login the home page (first open our website):
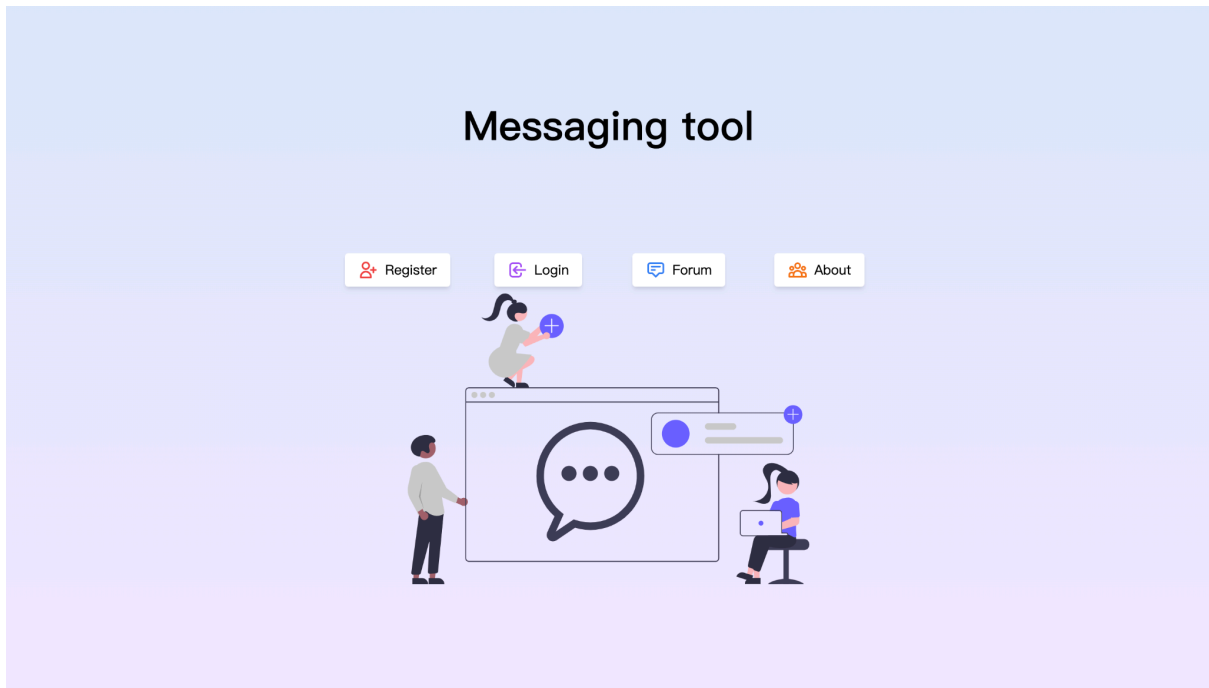
After login successfully, the home page:
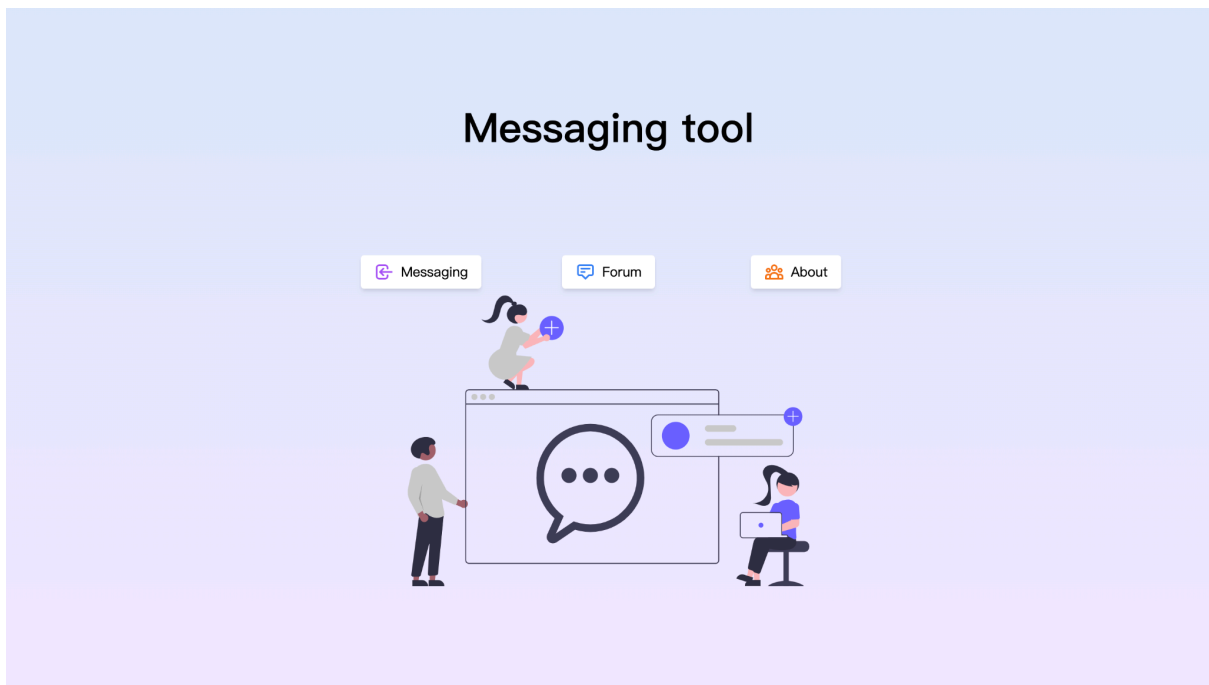
When click the "Forum" button:

Input "Hello" in the post name input area, input "Hello everyone, I am test" in the post content area and click "create post":

When creating a post successfully, it will show this popup:
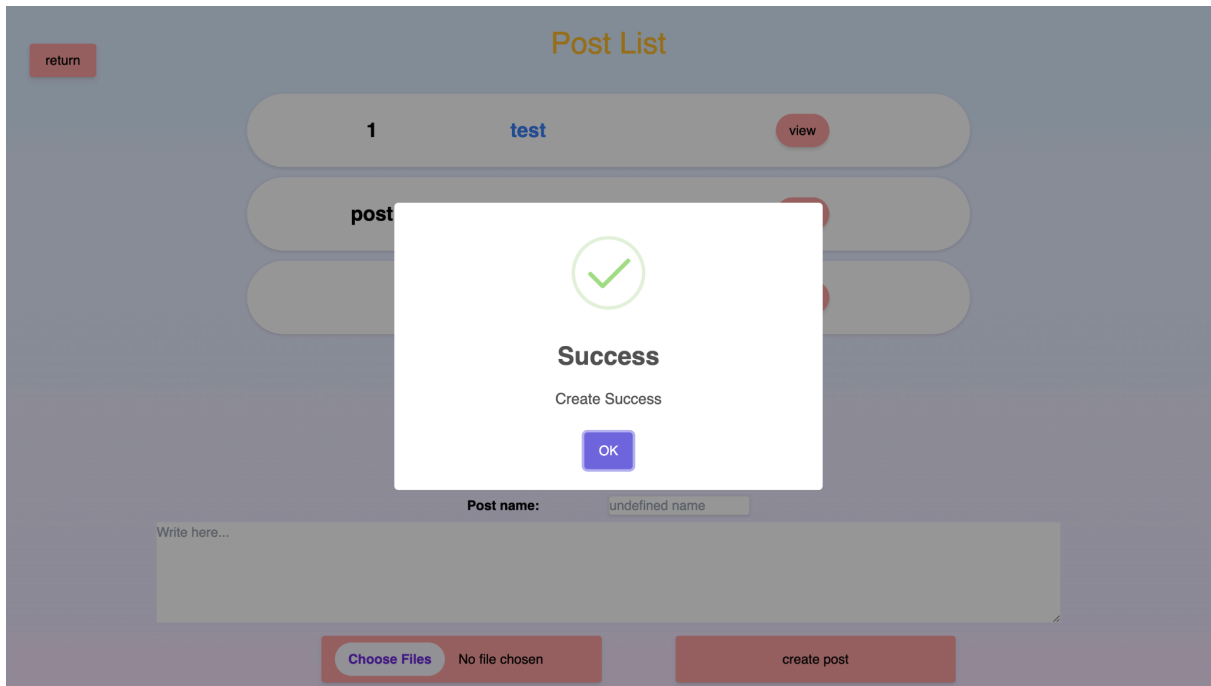
Click postcard "view" button:
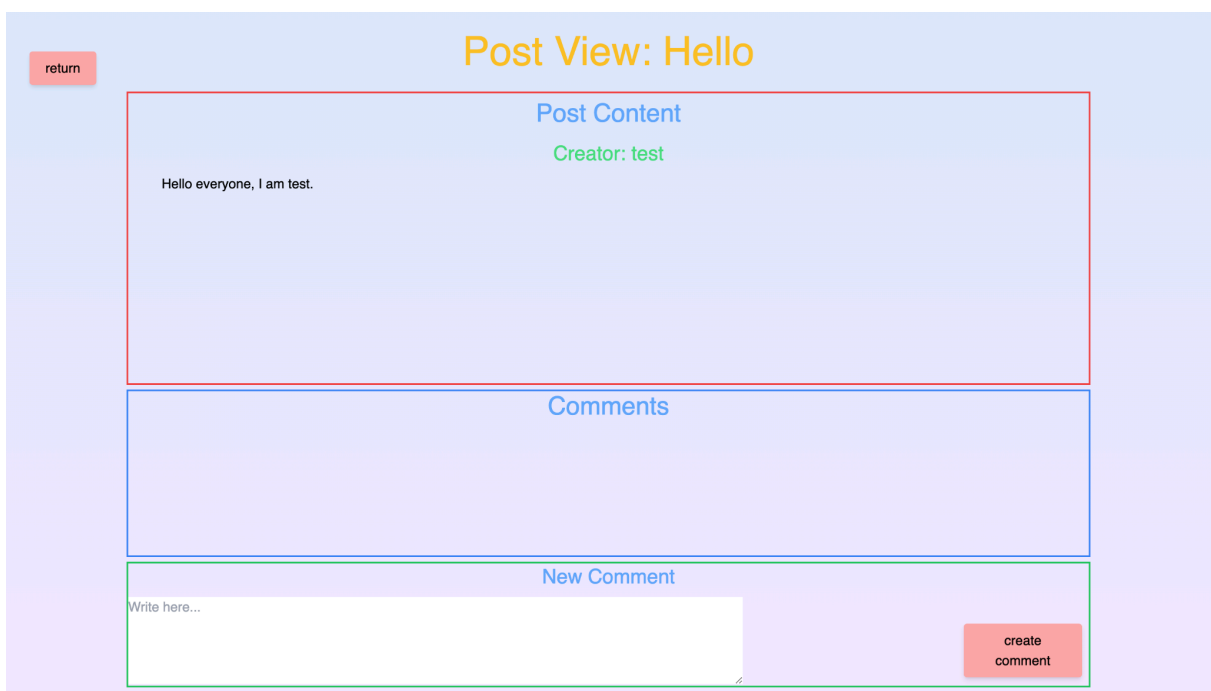
Another user called lavender sent a comment "hi, I am Lavender".

And then I sent the comment "Hello".

Post View: Hello

return

Post Content

Creator: test

Hello everyone, I am test.

Comments

lavender : hi, I am Lavender
test : Hello

New Comment

Hello

create comment

Click "return", rounter jump back to the forum page.

For admin: Has the "delete" button, click can delete the specific post.

Post List

return

post   admin   delete   view

hello   admin   delete   view

Post name: undefined name
Write here...

Choose Files   No file chosen   create post

When clicked the "delete" button, after delete successfully:

Result:

Categories	Functions	Result
Home(Main page)	About	87.5%
Friend(Friends)	Add Friend	100%
Account	Change password	75%
Acount(Post)	Change profile	75%
Forum(Post)	Comment the post	87.5%
Forum(Post)	Delete a document	75%
Forum(Post)	Delete a document	75%
Forum(Post)	Delete a post	87.5%
Account	Forget password	62.5%
Home(Main page)	Helps	62.5%
Home(Main page)	Login/logout	62.5%
Home(Main page)	Message box	62.5%
Home(Main page)	Notification	75%
Home(Main page)	Register	62.5%

Friend(Friends)	Remove friend	100%
Forum(Post)	Search	62.5%
Friend(Friends)	Send message	87.5%
Account(User account)	Setting	75%
Account(User account)	Switch account	87.5%
Forum(Post)	Upload document	75%

Prioritized list

Page	Function Name	Priority
Home	Register	0
Home	Login	0
Account	Log out	1
Friend	Add Friend	2
Forum	Create a Post	2
Forum	Comment the post	3
Friend	Send message to friend	3
Forum	Delete a post	4
Friend	Remove friend	4
Forum	Search information	5
Home	Forget password	6
Acccount	Change password	6
Acccount	Switch Account	6
Home	About	7
Home	Help	7
Account	Setting	7
Account	Notification	7

Test1:

Task	Priority
Register a account	3
Login in	3
Read the website's introduction	1
Add a friend	2
send message	2

Test2:

Task	Priority
create a post	3
comment the post	3
Delete a post	2
search information	2
anything else you like	1

Related Links:
Shared Card Sorting Open 1 URL
https://app.optimalworkshop.com/optimalsort/k032jv58/y527o46p/shared-results/23t20nw602m7bdn345cq4eioszqg0aeb

Shared Card Sorting Closed 1 URL
https://app.optimalworkshop.com/optimalsort/5165hhhp/c80f270f/shared-results/7d8c10x18a7eytdh31li3e5cyc3efos2

Shared Card sorting closed 2 URL
https://app.optimalworkshop.com/optimalsort/k032jv58/u575uwdv/shared-results/11f7c4112d63d50x83qx1800i7vp04g4

Shared Card sorting opened 2 URL
https://app.optimalworkshop.com/optimalsort/5165hhhp/kynkxd11/shared-results/l8alw3651eq6do65b152ukl31n6bn565s

Sitemap and lo-fi wireframe URL

https://miro.com/app/board/uXjVO204wlw=/?share_link_id=527859897084

Guerrilla Test 1:

荆芥   05-14 17:52:44

Hi Lavender, could you help us to do a guerrilla test?

清盤   05-14 17:53:02

OK

荆芥   05-14 17:54:19

Thank you very much. I will give you a few tasks and some prototype (lo-fi wireframe). And please operate the task on the prototype

荆芥   05-14 17:54:51

Tasks
register a account
login in a account
read the website's introduction
add a friend
send message

清盤   05-14 17:59:18

register a account :
1.click the "register" button at the home page
2. Username: Lavender Password:12345678 RePassword:1
2345678
3. click the "register" button

A typing online test guerrilla test 1.1

荆芥   05-14 17:59:51

Forum   Account   · Friend   About   Helps

Log in

Username

Add text

Forget password   Register

Next
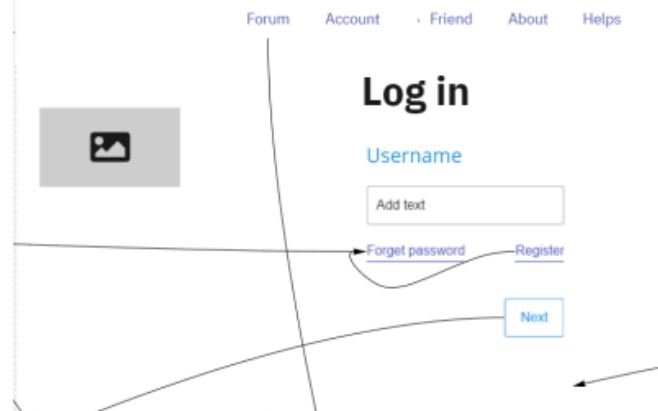
清盤   05-14 18:00:08

input "Lavender"

荆芥   05-14 18:00:18

return   Forum   Account   · Friend   About   Helps

Log in 2

Password

password

Log in
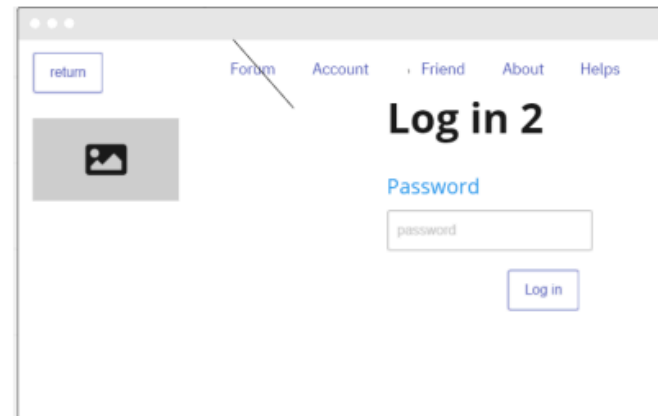
清盤   05-14 18:00:22

input "12345678"

A typing online guerrilla test 1.2

荆芥   05-14 18:01:11
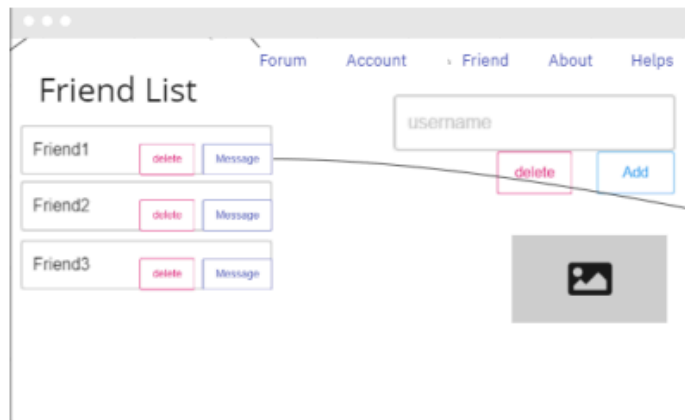
荆芥   05-14 18:01:35

(assume there is a friend called admin)

清盤   05-14 18:02:05

OK. input "admin" into the textarea and click "add"

荆芥   05-14 18:03:35
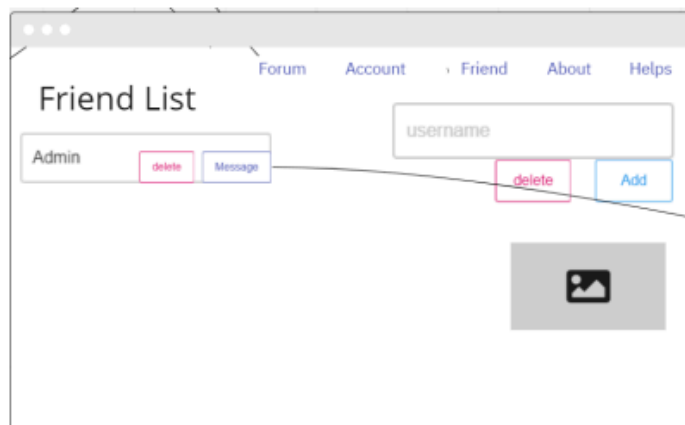
A typing online guerrilla test 1.3

清盤   05-14 18:03:54

click "Message" button

荆芥   05-14 18:04:33
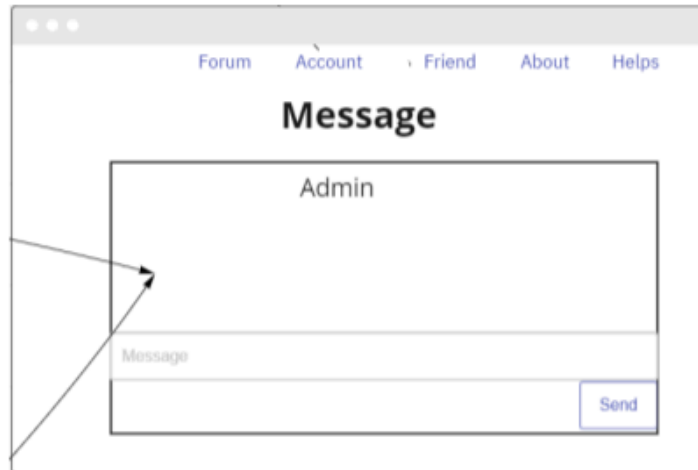
清盤   05-14 18:05:11

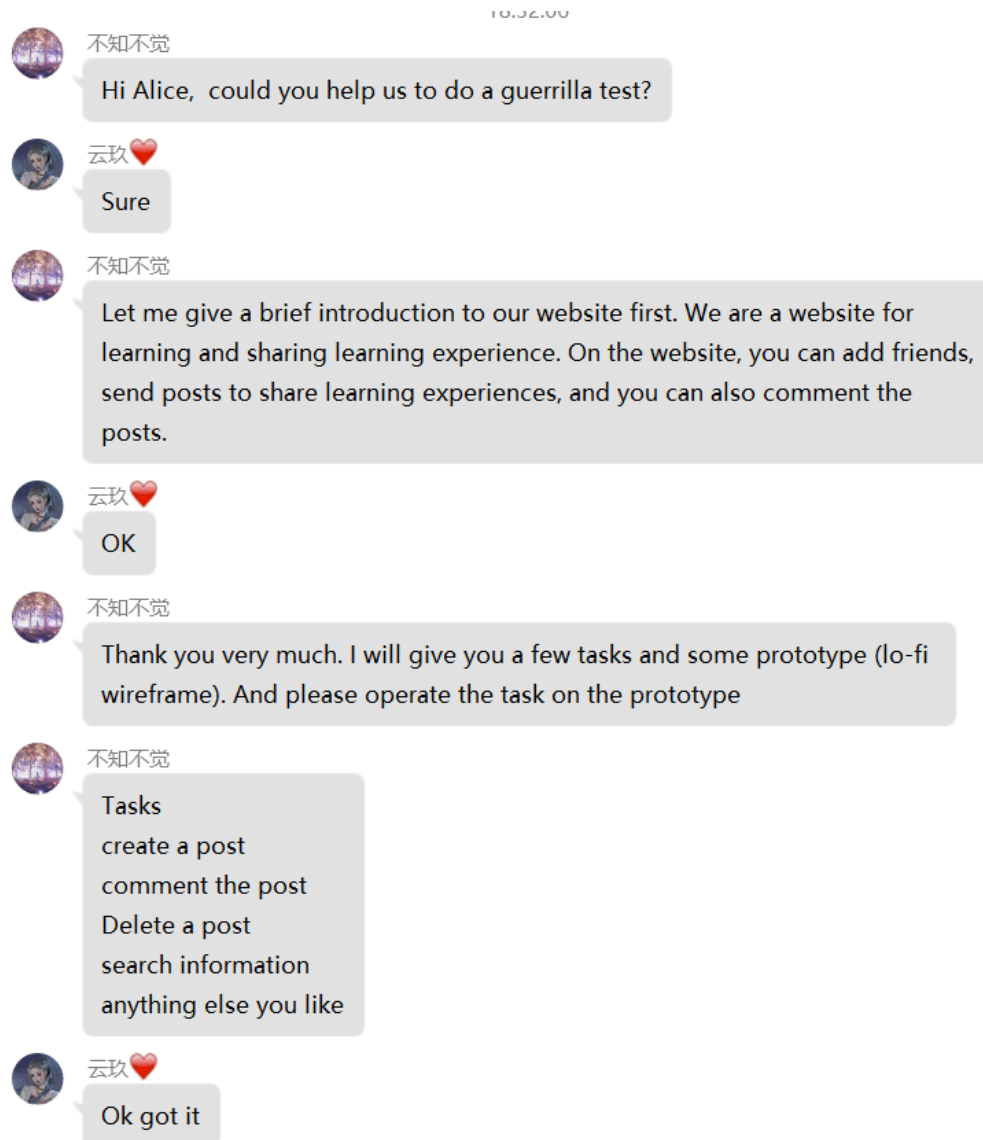input "Hello admin" and click "send" button

荆芥   05-14 18:06:30
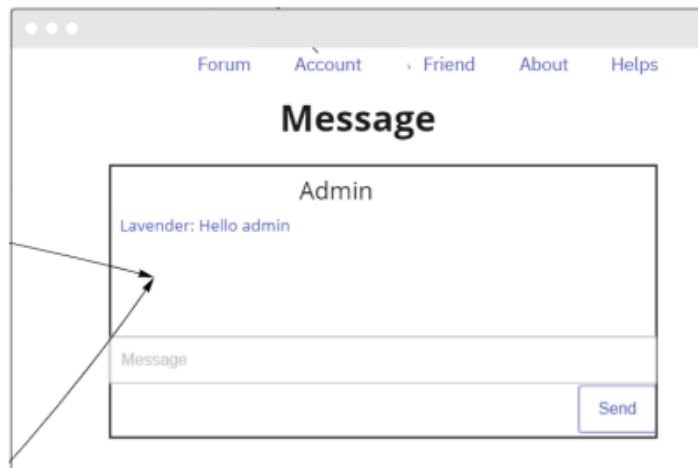
A typing online guerrilla test 1.4

清盤
What I need to do next?

荆芥 05-14 18:07:54
Do you think you are done? If it's done, just say it's done

清盤 05-14 18:08:16
It's done

荆芥 05-14 18:09:21
how do you feel it? and Do you have any suggestion?

清盤 05-14 18:11:09
I think it looks good. But how does the last page return to the friend list page? I think maybe you can add a button such as "return".

荆芥 05-14 18:12:00
Good idea, do you have any other suggestions?

清盤 05-14 18:12:19
Maybe not.

荆芥 05-14 18:12:40
Thank you very much for taking the test

清盤 05-14 18:13:02
My pleasure

A typing online guerrilla test 1.4

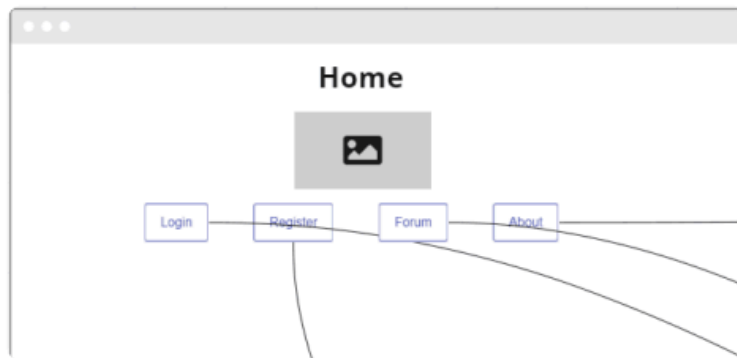Guerrailla test 2

不知不觉

Hi Alice, could you help us to do a guerrilla test?

云玖❤️

Sure

不知不觉

Let me give a brief introduction to our website first. We are a website for learning and sharing learning experience. On the website, you can add friends, send posts to share learning experiences, and you can also comment the posts.

云玖❤️

OK

不知不觉

Thank you very much. I will give you a few tasks and some prototype (lo-fi wireframe). And please operate the task on the prototype

不知不觉

Tasks
create a post
comment the post
Delete a post
search information
anything else you like

云玖❤️

Ok got it

A typing online guerrilla test 2.1

不知不觉

Home

| Login | Register | Forum | About |

云玖❤️

Oh. So maybe I need to click fourm first. click "forum" !

不知不觉

Forum Account Friend About Helps

Forum

return

Q Search

Hello World

Delete | View

Post title1
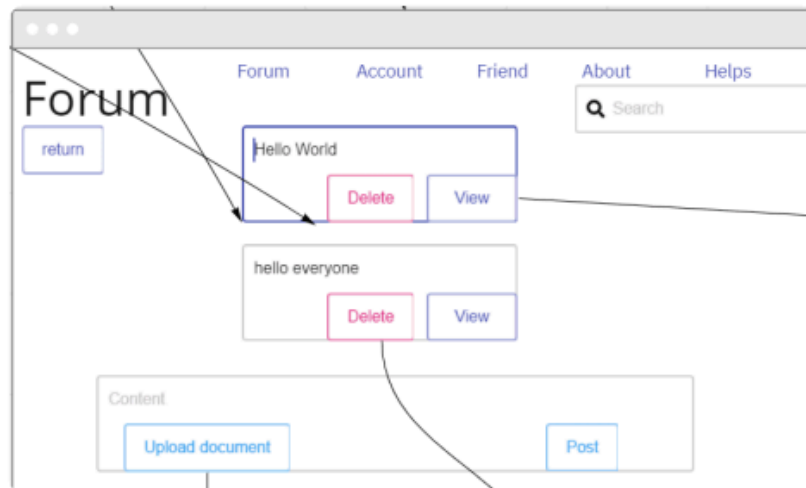
Delete | View

Content

Upload document | Post
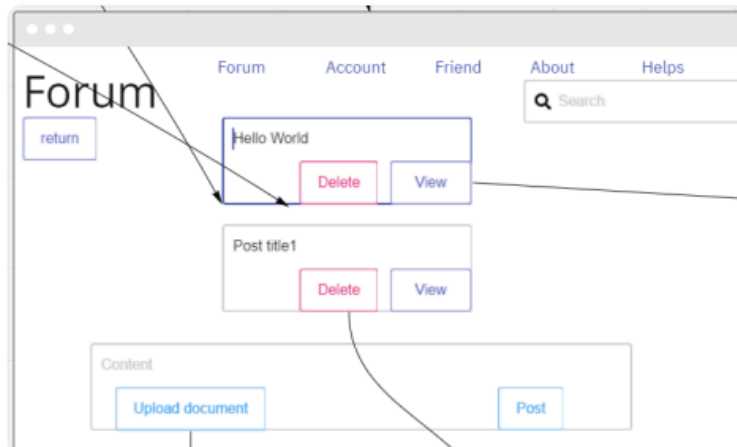
云玖❤️

Input something like "hello everyone" in content area, click Post
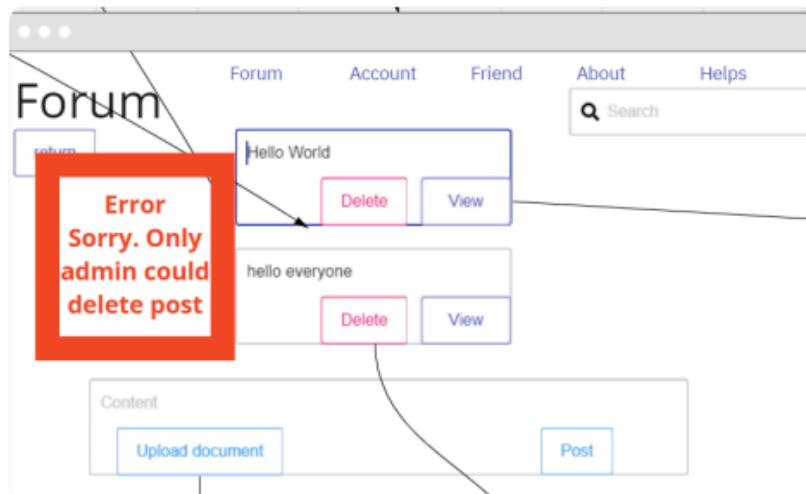
A typing online guerrilla test 2.2

不知不觉

云玖❤️

Click " delete " bellow " Hello world"

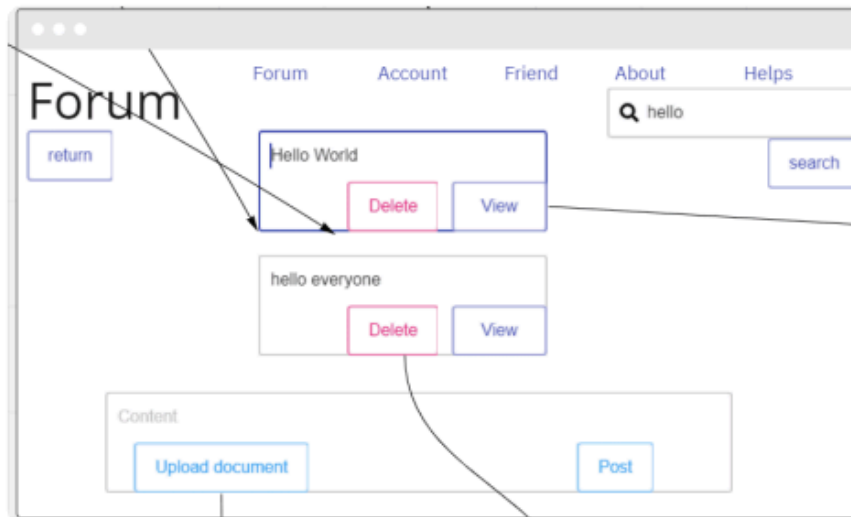18:54:20

不知不觉

云玖❤️

Ok

A typing online guerrilla test 2.3

云玖❤️

type "hello" in search box

18:59:54

不知不觉

云玖❤️
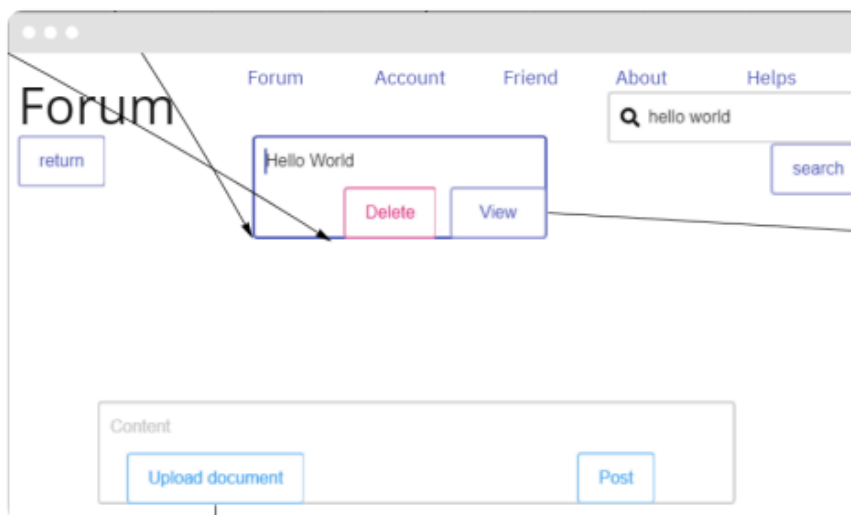
type "hello world" in search box

云玖❤️

click "search"

不知不觉

A typing online guerrilla test 2.4
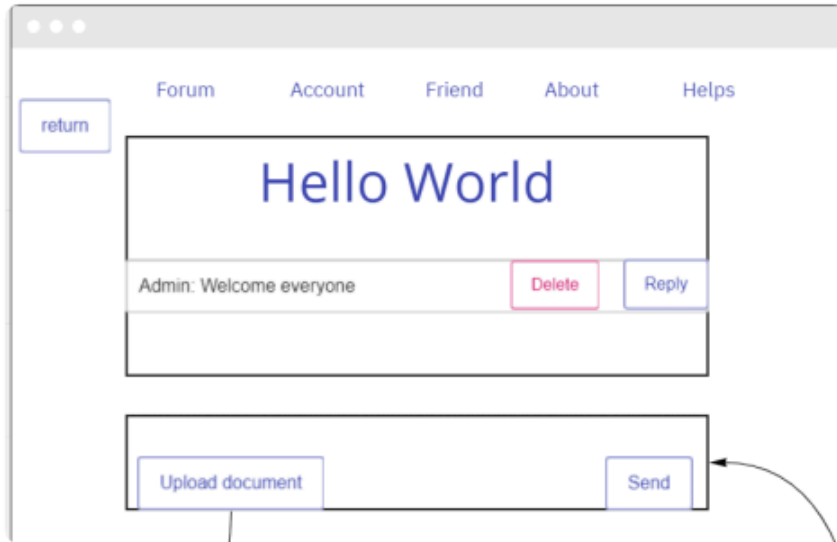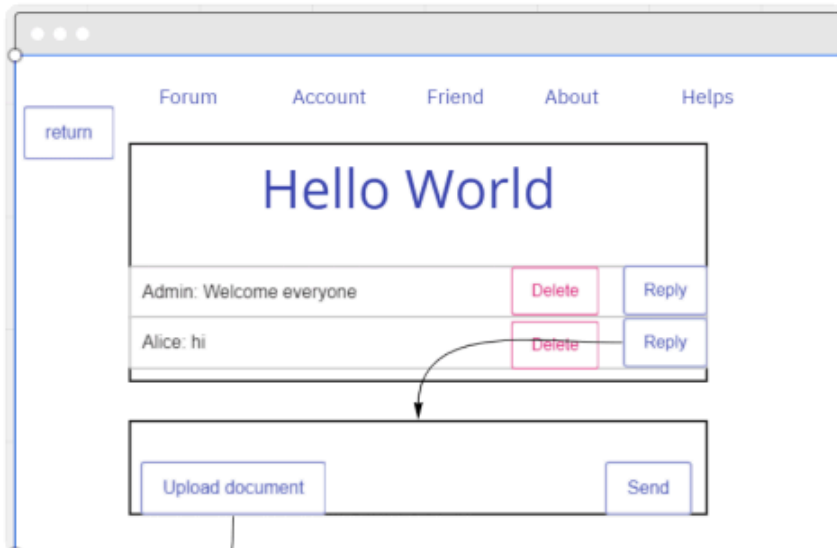
云玖❤️

click "view"

不知不觉

| Forum | Account | Friend | About | Helps |

return

Hello World

Admin: Welcome everyone   Delete   Reply

Upload document   Send

云玖❤️

input"hi" click send

19:10:44

不知不觉

| Forum | Account | Friend | About | Helps |

return

Hello World

Admin: Welcome everyone   Delete   Reply

Alice: hi   Delete   Reply

Upload document   Send

A typing online guerrilla test 2.5

云玖❤️
Ok. I think done.

不知不觉
No problem, how do you feel it? and Do you have any suggestion?

云玖❤️
I am not admin, why show me the "delete" button and then tell me I can't delete. 😭 I think maybe you can hide "delete" button. And only shows when I am admin.

不知不觉
Great idea, do you have any other suggestions?

云玖❤️
Nope

不知不觉
Thank you very much for taking the test

云玖❤️
No thanks

A typing online guerrilla test 2.6