

Web Applications and Services 2022 Assignment

Candidate Number: 215717

Contents

Web Layer	2
Implemented	2
Not Implemented	2
Business Layer.....	2
Implemented	2
Persistence Layer	2
Implemented	2
Security Layer	3
Implemented	3
Not Implemented	3
Web Services and Thrift	3
Implemented	3
Not Implemented	3
User Manual	4
Initial Page.....	4
Log In	4
Registering A New User	5
User Page.....	6
Make A Payment	7
Make A Request	10
View Transactions	12
View Requests	12
Administrator Page	14
View User Accounts	15
View All Transactions	15
Register A New Admin	16

Web Layer

Implemented

- Users can
 - View all their previous transactions with timestamps
 - Make direct payments to other registered users
 - Validated to check if the amount is between 0.01 and their account value
 - Request payments from other registered users
 - Conversions hard coded in the transaction service EJB
- Administrators can
 - View all user accounts and their details
 - View all transactions made and their details
 - Register new admins

Not Implemented

- Notifications regarding payments made to their account
- Notifications regarding requests for payments
- Users can't reject or make a response to request, only make a payment
- No checks are made if the user doesn't have enough to fulfil the request
- Outgoing requests

Business Layer

Implemented

- EJBs have been created for different tasks
- AdminService
 - Singleton EJB that uses postConstruct to generate an initial administrator
- RequestService
 - Used to persist requests into the database and update the statuses
- TransactionService
 - Used to read and write transaction data, transactionAttribute REQUIRED annotation is used to ensure integrity
- UserService
 - Accesses user related data such as user transactions, requests, and user details
 - Used to register users and record transactions made by the user

Persistence Layer

Implemented

- Several JPA entities have been implemented and using JavaDB as my RDBMS which is installed on the Payara server
- These are accessed using entity managers
- SystemUser
 - Contains user data: username, password, value, currency
- SystemUserGroup
 - Contains what users belong to what group (admins or users)
- UserRequest
 - Contains request data: requester id, recipient id, amount, and the status to check if it's been fulfilled or not
- UserTransaction
 - Contains transaction data: sender id, recipient id, amount, and timestamp

Security Layer

Implemented

- Form-based authentication (via j_security and a custom jdbcRealm)
- Logout functionality
- Declarative security to restrict access to web pages to non-authorised users
 - Security constraints are added to the deployment descriptor such that users can only access 'users' pages and admins can only access 'admins' pages

Not Implemented

- Communication on top of HTTPS for every interaction with users and admins
- Declarative security to restrict access to EJB methods

Web Services and Thrift

Implemented

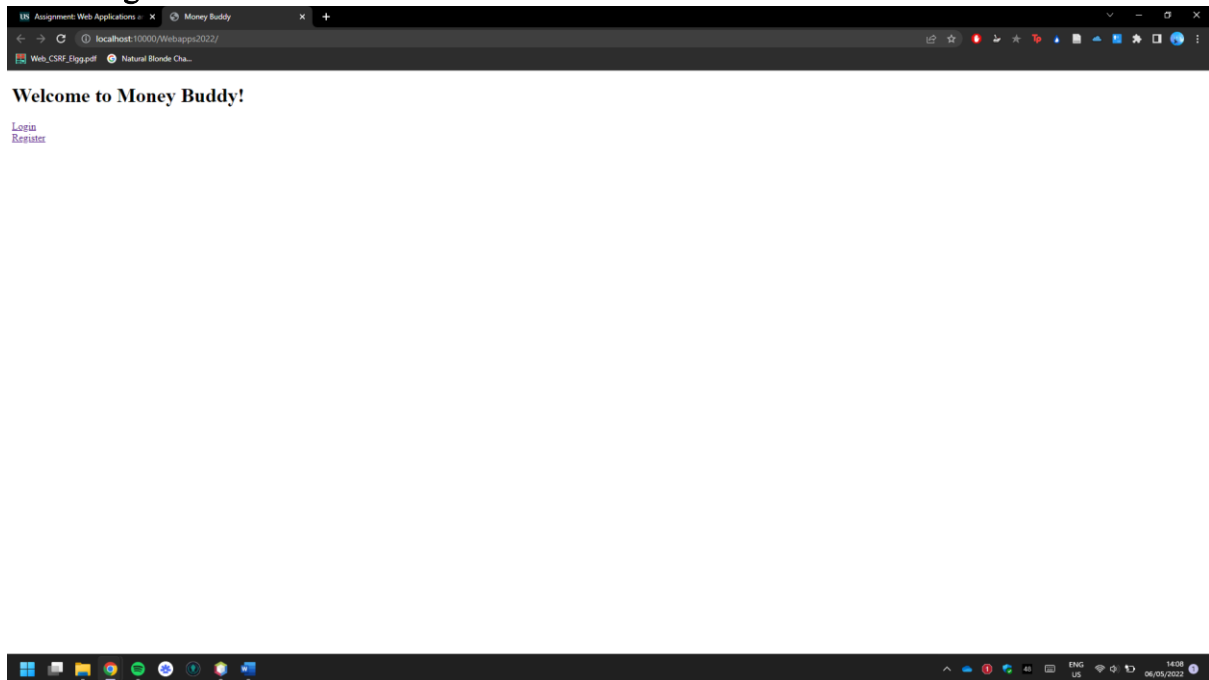
- Thrift service implemented for timestamps
 - Thrift timestamp service deployed on the same server as my system that returns the date and time requested by UserBean
 - The server is implemented as a deployable EJB on a separate thread accepting time-stamping requests at port 10001

Not Implemented

- REST service

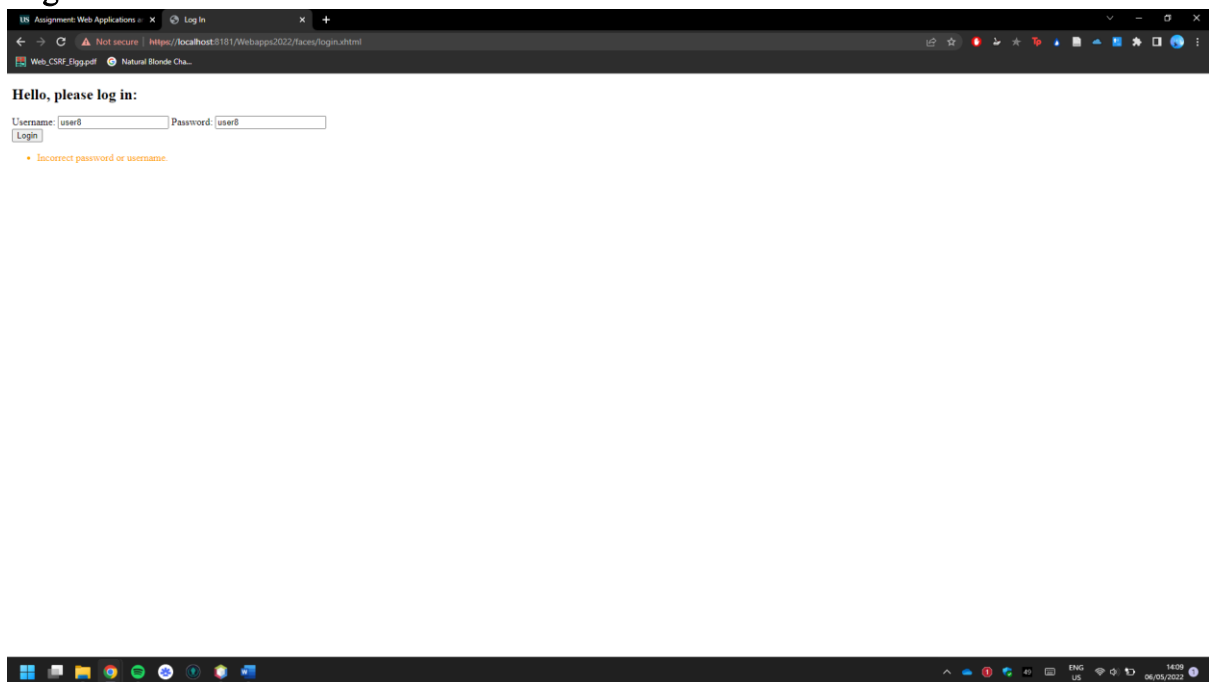
User Manual

Initial Page



- User can choose to log in or register a new user

Log In



- Using incorrect credentials prevents the user from logging in
- However, using correct credentials allows the user to access their user page

Registering A New User



The screenshot shows a web browser window with the title "Assignment: Web Applications" and "User Registration". The address bar shows "https://localhost:8181/Webapps2022/faces/registration.xhtml". The page content includes a form with the following fields: "User name:" (text input), "Password:" (password input), "First Name:" (text input), "Last Name:" (text input), and "Currency:" (dropdown menu with "GBP" selected). Below the form are two buttons: "Register" and "Reset Form". A "Back" button is also visible at the bottom left of the form area.

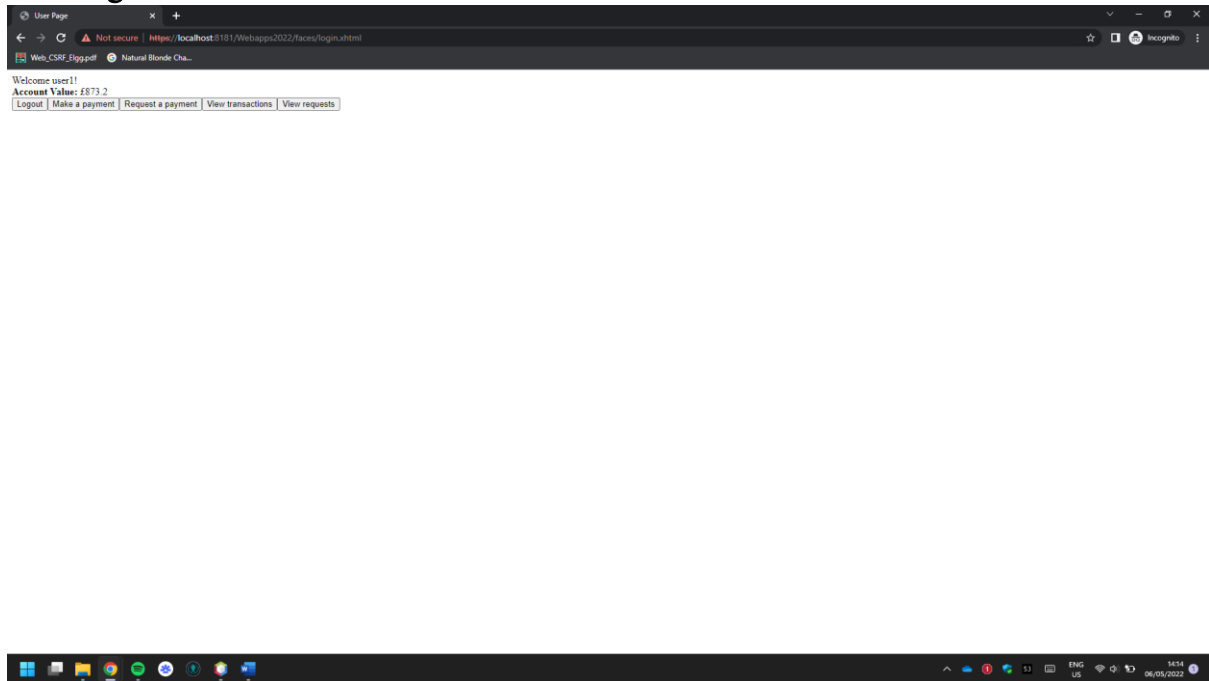
- Register a new user by adding a username, password, first name and last name, and choice of currency between GBP, USD, and EUR



The screenshot shows the same web browser window as before, but with the form fields filled out: "User name:" is "user1", "Password:" is empty, "First Name:" is "Carl", "Last Name:" is "Cott", and "Currency:" is "GBP". The "Register" button is highlighted. Below the form, an error message is displayed: "• Username already exists!".

- A username that is already in the database prevents the user from registering the user
- If the user is registered, they are taken back to the home page

User Page



- User can see their account value and the options they can select:
 - Make a payment – direct payments to other registered users on the system
 - Request a payment – request payments from other registered users on the system
 - View transactions – view previously made transactions, outgoing and incoming
 - View requests – view requests received from other registered users on the system

Make A Payment

Select a user

User List

Username	Name	Surname	
admin1	Money	BuddyAdmin	Select
user2	Charles	Colt	Select
user3	John	Train	Select
user4	Kelly	Gray	Select
admin2	Jerry	Jules	Select
admin3	Rachel	Tear	Select
admin4	Carl	Tear	Select

Back

- Select a user to pay to

User Payment

Sender Details

Name: Harry
Surname: Truman
Amount: £873.2

Recipient Details

Name: Charles
Surname: Colt

Enter an amount: 0.0 Submit

Confirmation

You are about to send £0.0 Send

Back

- User can view their details and the recipient details
- User can enter an amount to send with restrictions

Candidate Number: 215717

User Payment

Not secure | https://localhost:8181/Webapps2022/faces/users/user_direct_payment.xhtml

Web_CSRF_Eggypdf Natural Blonde Cha...

Sender Details

Name: Harry
Surname: Truman
Amount: £873.2

Recipient Details

Name: Charles
Surname: Colt

Enter an amount: 890 Submit

Confirmation

You are about to send £0.0 Send

Back

pay: Validation Error: Specified attribute is not between the expected values of 0.01 and 873.2

- Cannot send an amount smaller than 0.01 or larger than their account value

User Payment

Not secure | https://localhost:8181/Webapps2022/faces/users/user_direct_payment.xhtml

Web_CSRF_Eggypdf Natural Blonde Cha...

Sender Details

Name: Harry
Surname: Truman
Amount: £873.2

Recipient Details

Name: Charles
Surname: Colt

Enter an amount: 800.0 Submit

Confirmation

You are about to send £800.0 Send

Back

- If a valid amount is inputted, then the confirmation message is updated with the amount

Candidate Number: 215717

User Payment

Not secure | https://localhost:8181/webapps2022/faces/users/user_direct_payment.xhtml

Web, CSRF, Eggypdf | Natural Blonde Cha...

Sender Details

Name: Harry
Surname: Truman
Amount: £73.2000000000000005

Recipient Details

Name: Charles
Surname: Colt

Enter an amount: 800.0 Submit

Confirmation

You are about to send **£800.0** | Send
Sent! Date and Time: 06/05/2022 14:22:47

Back

- When the user hits the send button, the value is sent, and a timestamp is printed to the user

Make A Request

- Similar to make a payment page

Request Payment

Not secure | https://localhost:8101/Webapps2022/faces/users/request_payment.xhtml

Web_CSRF_Eggpdf Natural Blonde Cha...

Request payment

User List

Username	Name	Surname	
admin1	Money	BuddyAdmin	Select1
user2	Charles	Colt	Select1
user3	John	Tram	Select1
user4	Kelly	Gray	Select1
admin2	Jerry	Jules	Select1
admin3	Rachel	Tear	Select1
admin4	Carl	Tear	Select1

Back

- Select a user to make a request to

Send Request

Not secure | https://localhost:8101/Webapps2022/faces/users/request_payment.xhtml

Web_CSRF_Eggpdf Natural Blonde Cha...

Requester Details

Name: Harry
Surname: Truman
Amount: £73.20000000000000000000

Recipient Details

Name: Charles
Surname: Colt

Request Amount: 0.0 Submit

Confirmation

You are about to request £0.0 Send

Back

- Similar to making a payment, the user inputs an amount to request from the recipient

Candidate Number: 215717

Send Request

Not secure | https://localhost:8181/Webapps2022/faces/users/user_request_sender.xhtml

Web_CSRF_Eggypdf Natural Blonde Cha...

Requester Details

Name: Harry
Surname: Truman
Amount: £73.200000000000005

Recipient Details

Name: Charles
Surname: Colt

Request Amount:

Confirmation

You are about to request £20.0

Request sent!

- When sent, a confirmation message 'Request sent!' is printed to the user

View Requests

Not secure | https://localhost:8181/Webapps2022/faces/users/view_requests.xhtml

Web_CSRF_Eggypdf Natural Blonde Cha...

User Requests

Request ID	From	Value Requested	Status	
551	Harry Truman	£20.0	Pending	<input type="button" value="Select"/>
752	Kelly Gray	€100.0	Fulfilled	
801	Harry Truman	£2.0	Pending	<input type="button" value="Select"/>
852	Harry Truman	£20.0	Pending	<input type="button" value="Select"/>

- A new request appears on the recipient's user page

View Transactions

The screenshot shows a web browser window with the title 'User Transactions'. The address bar displays 'https://localhost:5181/Webapps2022/faces/users/view_transactions.xhtml'. The page content includes a table of transactions with columns: ID, Sender, Recipient, Value Transferred, and Timestamp. Below the table is a 'Back' button. The Windows taskbar at the bottom shows the system clock as 14:27 on 06/05/2022.

ID	Sender	Recipient	Value Transferred	Timestamp
101	Harry Truman	Charles Colt	£50.0	05/05/2022 19:39:50
102	Harry Truman	Charles Colt	£12.0	05/05/2022 19:39:53
201	John Train	Harry Truman	\$30.0	05/05/2022 19:49:56
251	Harry Truman	Charles Colt	£20.0	05/05/2022 19:53:58
301	Harry Truman	John Train	£20.0	05/05/2022 20:19:26
601	Charles Colt	Harry Truman	£20.0	06/05/2022 00:14:45
603	Harry Truman	John Train	£16.0	06/05/2022 00:16:30
651	Harry Truman	John Train	£16.0	06/05/2022 00:19:28
702	Harry Truman	Kelly Gray	£16.8	06/05/2022 00:24:19
802	Harry Truman	Rachel Tear	£20.0	06/05/2022 13:54:45
851	Harry Truman	Charles Colt	£800.0	06/05/2022 14:22:47

- User can view incoming and outgoing transactions with the value (with currency) and timestamps

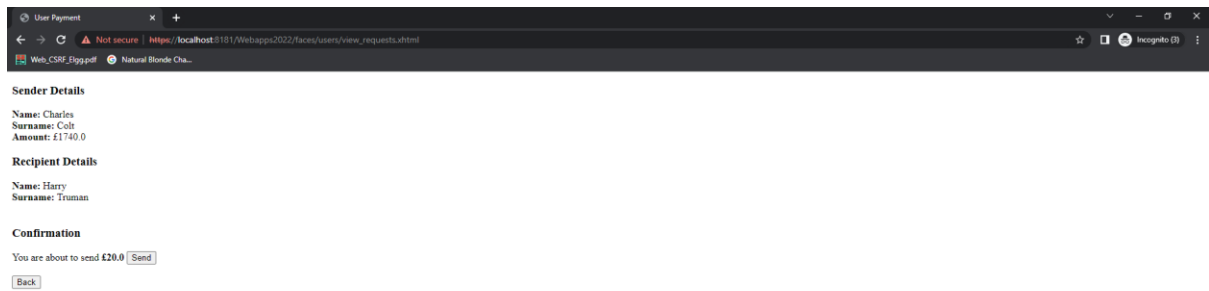
View Requests

The screenshot shows a web browser window with the title 'View Requests'. The address bar displays 'https://localhost:5181/Webapps2022/faces/users/view_requests.xhtml'. The page content includes a table of requests with columns: Request ID, From, Value Requested, and Status. Each status cell contains a 'Select' button. Below the table is a 'Back' button. The Windows taskbar at the bottom shows the system clock as 14:27 on 06/05/2022.

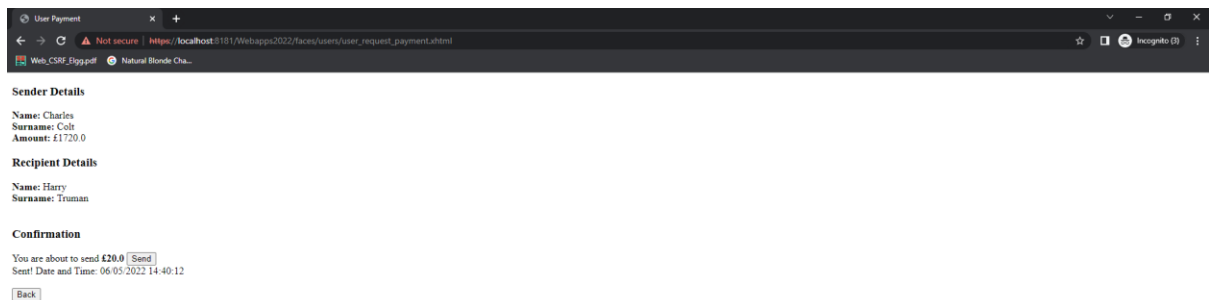
Request ID	From	Value Requested	Status
551	Harry Truman	£20.0	Pending <input type="button" value="Select"/>
752	Kelly Gray	€100.0	Fulfilled
801	Harry Truman	£2.0	Pending <input type="button" value="Select"/>
852	Harry Truman	£20.0	Pending <input type="button" value="Select"/>

- Requests from other registered users can be viewed, where some may be fulfilled, and some are pending

Candidate Number: 215717

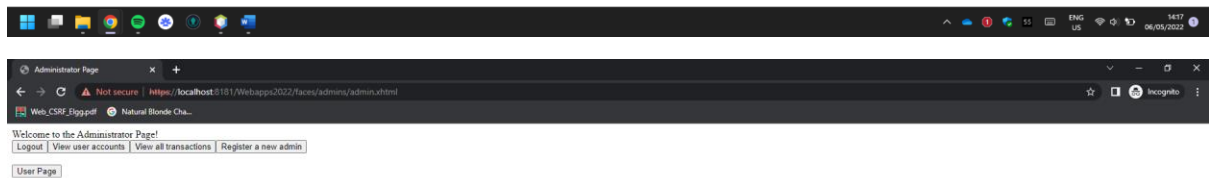


- Upon clicking a pending request, the user is presented with their details and the recipient's (requester's) details



- When clicking the send button, a confirmation message and a timestamp is printed

Administrator Page



- Admins have an 'Administrator Page' button appear for them, where they can access admin level options:
 - View user accounts – view all user accounts and their details on the system
 - View all transactions – view all transactions made by all users
 - Register a new admin – register a new admin that can access the same options as above

View User Accounts

Web_CSRF_Eggpdf Natural Blonde Cha...

Not secure | https://localhost:5181/Webapps2022/faces/admins/user_accounts.xhtml

Incognito (3)

All User Accounts

Account ID	Username	Name	Surname	Currency	Value
1	admin1	Money	BuddyAdmin	GBP	1000.0
2	user1	Harry	Truman	GBP	155.200000000000005
3	user2	Charles	Colt	GBP	1720.0
151	user3	John	Tram	USD	1318.12000000000001
351	user4	Kelly	Gray	EUR	1320.96
352	admin2	Jerry	Jules	GBP	1000.0
401	admin3	Rachel	Tear	GBP	1020.0
451	admin4	Carl	Tear	GBP	1000.0

Back

- Admins can view all user accounts with details: account ID, username, name, surname, currency, and account value

View All Transactions

Web_CSRF_Eggpdf Natural Blonde Cha...

Not secure | https://localhost:5181/Webapps2022/faces/admins/view_transactions.xhtml

Incognito (3)

All User Transactions

Transaction ID	Sender ID	Sender	Recipient ID	Recipient	Value Transferred	Timestamp
101	2	Harry Truman	3	Charles Colt	£50.0	05/05/2022 19:39:50
102	2	Harry Truman	3	Charles Colt	£12.0	05/05/2022 19:39:53
201	151	JohnTram	2	Harry Truman	\$30.0	05/05/2022 19:49:56
202	151	JohnTram	3	Charles Colt	\$30.0	05/05/2022 19:50:07
251	2	Harry Truman	3	Charles Colt	£20.0	05/05/2022 19:53:58
301	2	Harry Truman	151	JohnTram	£20.0	05/05/2022 20:19:26
601	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 00:14:45
603	2	Harry Truman	151	JohnTram	£16.0	06/05/2022 00:16:30
651	2	Harry Truman	151	JohnTram	£16.0	06/05/2022 00:19:28
702	2	Harry Truman	351	KellyGray	£16.8	06/05/2022 00:24:19
753	3	Charles Colt	351	KellyGray	£84.0	06/05/2022 00:31:01
802	2	Harry Truman	401	RachelTear	£20.0	06/05/2022 13:54:45
851	2	Harry Truman	3	Charles Colt	£800.0	06/05/2022 14:22:47
853	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 14:29:40
901	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 14:33:40
902	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 14:37:42
903	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 14:37:44
956	3	Charles Colt	2	Harry Truman	£20.0	06/05/2022 14:40:12

Back

- Admins can view all transactions with details: transaction ID, sender ID, sender full name, recipient ID, recipient full name, value transferred (with currency symbol), and timestamp

Candidate Number: 215717

Register A New Admin

Admin Registration

Not secure | https://localhost:5181/Webapps2022/faces/admins/register_admin.xhtml

Web_CSRF_Piggy.pdf | Natural Blonde Cha...

Register new admin
Fill in the details and press the register button.

User name:

Password:

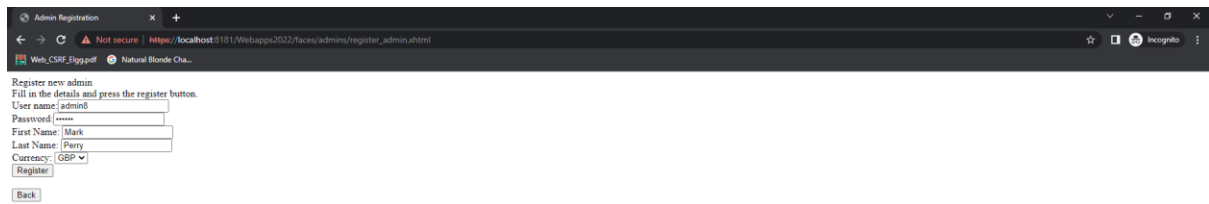
First Name:

Last Name:

Currency:

- Similar to the user registration page, an admin can register a new admin

Candidate Number: 215717



Admin Registration

Register new admin
Fill in the details and press the register button.

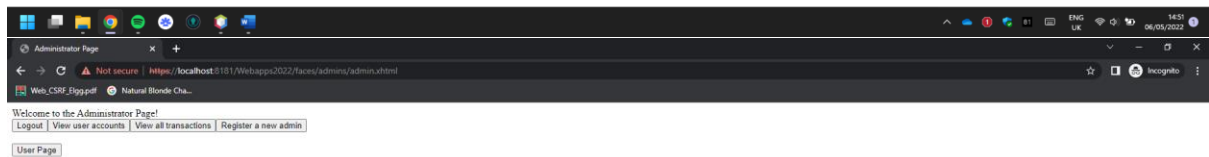
User name:

Password:

First Name:

Last Name:

Currency:



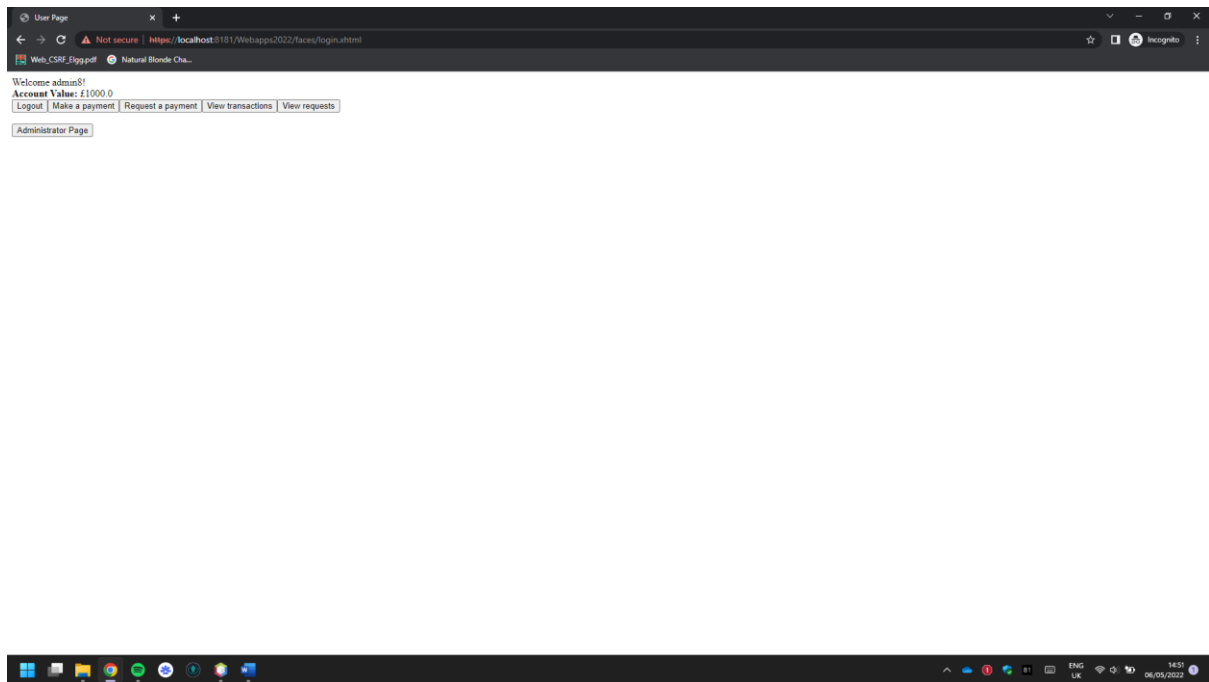
Administrator Page

Welcome to the Administrator Page!

[Logout](#) [View user accounts](#) [View all transactions](#) [Register a new admin](#)

- Once registering a new admin, the current admin user is returned to their administrator page

Candidate Number: 215717



- The new admin ('admin8') is able to log in with the administrator page available to them