Layers

The sections below describe the extent to which requirements were achieved, stating the implementation for each.

REQUIREMENT	IMPLEMENTATION
Presentation Layer	
User can view all transactions	✓ All user transactions displayed on transactions page
User can make direct payments to other users	✓ User can make payments on transfer page
User can request payments from other users	✓ User can make transfer requests on requests page
User can view balance	✓ User can view balance on home page
Admin can view all user accounts	✓ Admin can view all user accounts and balances on home page
Admin can view all transactions	✓ Admin can view all user transactions on Transactions page
Admin can register new admins	✓ Admin can register new admins on register admin page
Business Logic Layer	
Transactions guarantee ACID properties	✓ Transactions use transaction.atomic decorator where necessary to ensure ACID properties
Views to support presentation layer	✓ Views support all presentation layer requirements specified above
Data Access Layer	
Appropriate models created using SQLite	✓ All necessary models are implemented, and use the SQLite database generated
Appropriate table relations created	✓ All models use foreign keys where necessary, cascading on deletion
Security Layer	
Authentication functionality (registration, login, logout)	✓ All users and admins can login, logout, and register
Access control	✓ Website cannot be accessed without a user login ✓ Users cannot access admin-specific pages
Communication on top of HTTPS	✓ Self-signed certificate and key file generated for HTTPS use
Protection against cross-site scripting (XSS), cross-site request forgery (CSRF), SQL injection, and clickjacking.	✓ CSRF tokens required for requests ✓ All data thoroughly validated on entry
Initial admin registration	✓ Admin is initialised in accordance with outline
Web Services	
RESTful web service that responds to GET requests	✓ RestAPI implemented in api application

RestAPI responds with HTTPResponse	✓ API responds with HTTPResponse containing conversion rate and amount of second input currency

User Manual

This section shows a series of screenshots for the user, and the admin. These show the features for the user, admin, and the RestAPI route.

User

Screenshots showing views for the normal user:

Fig.1.1 User login

Fig.1.2 User registration

Fig.1.3 User navigation bar

WebApps

Home
Balance

Currency	Balance
GBP	1324
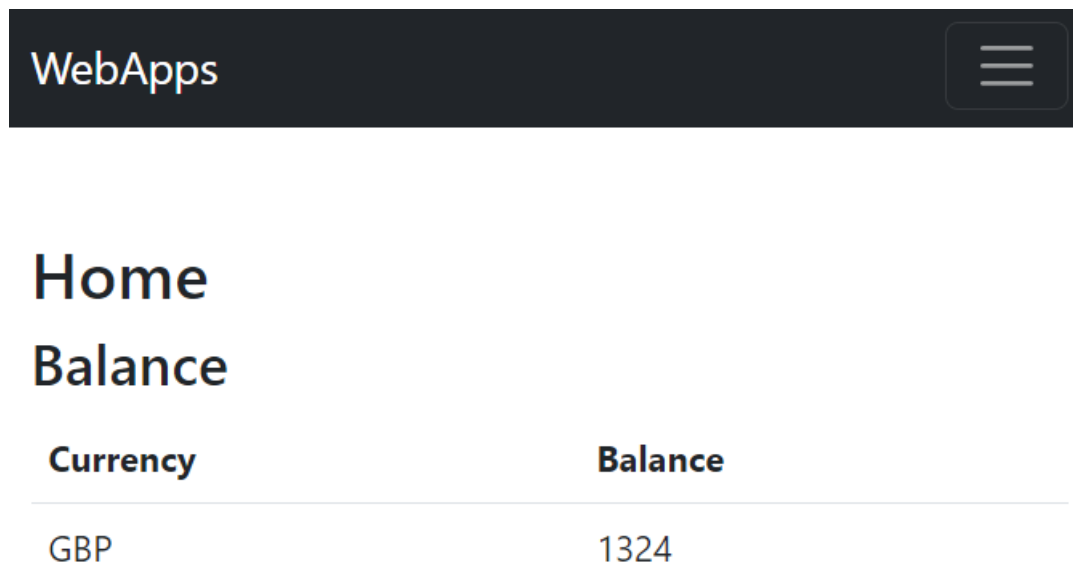
Fig.1.4 User home page and balance

WebApps

Transactions

Amount	Direction	User	Date
50	Sent to	user2	May 4, 2023, 8:18 p.m.
100	Sent to	user3	May 4, 2023, 8:19 p.m.
24	Received from	user2	May 4, 2023, 9:54 p.m.
320	Received from	user2	May 4, 2023, 9:54 p.m.
308	Received from	user3	May 4, 2023, 9:55 p.m.
108	Sent to	user2	May 4, 2023, 9:55 p.m.
70	Sent to	user3	May 4, 2023, 9:55 p.m.
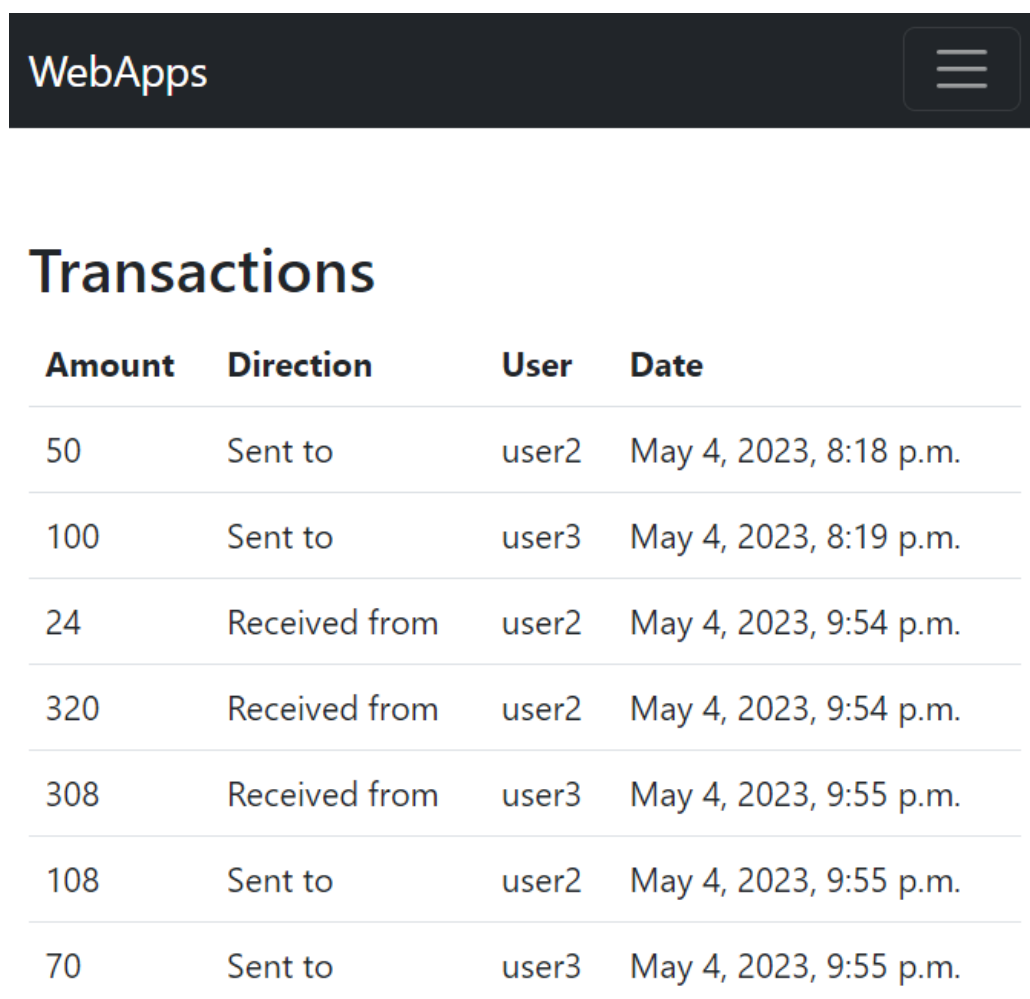
Fig.1.5 User transactions page

WebApps

Requests

Amount	Requested From		
280	user2	Reject	Accept
8	user2	Reject	Accept
30	user3	Reject	Accept
12	user2	Reject	Accept

Fig.1.6 User requests page

WebApps

Transfer

Transfer to user: *
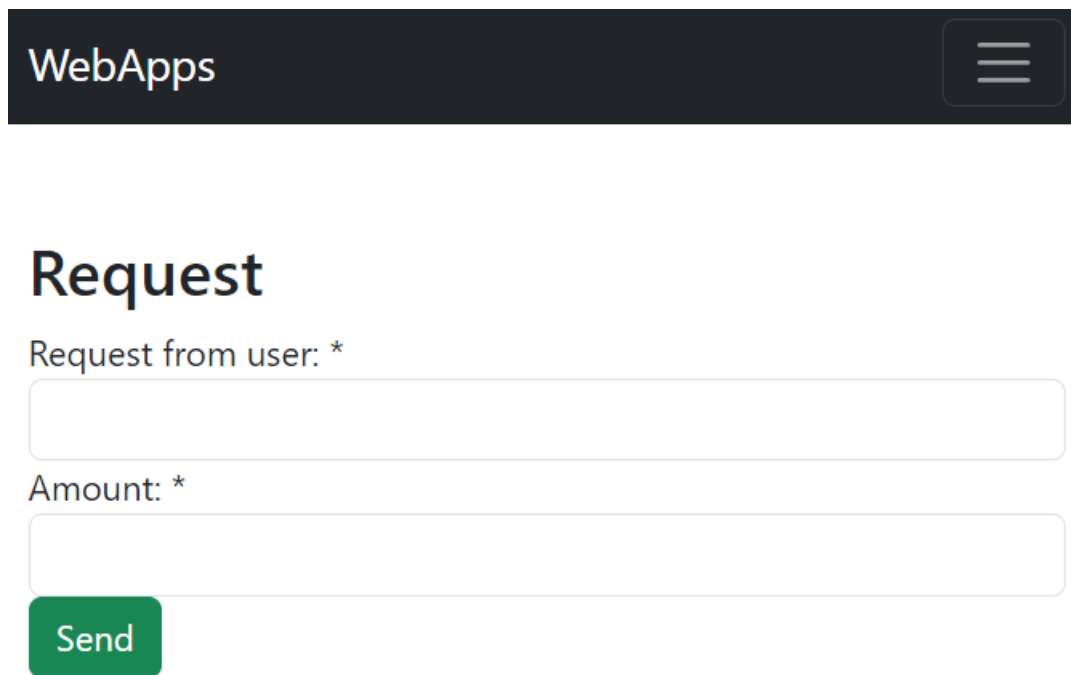
user3
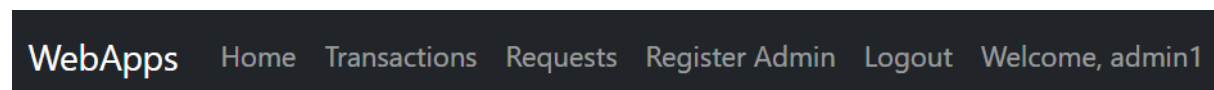
Amount: *

124

Transfer

Fig.1.7 User payment page

WebApps ☰

Request

Request from user: *

[   ]

Amount: *

[   ]

Send

Fig.1.8 User payment request page
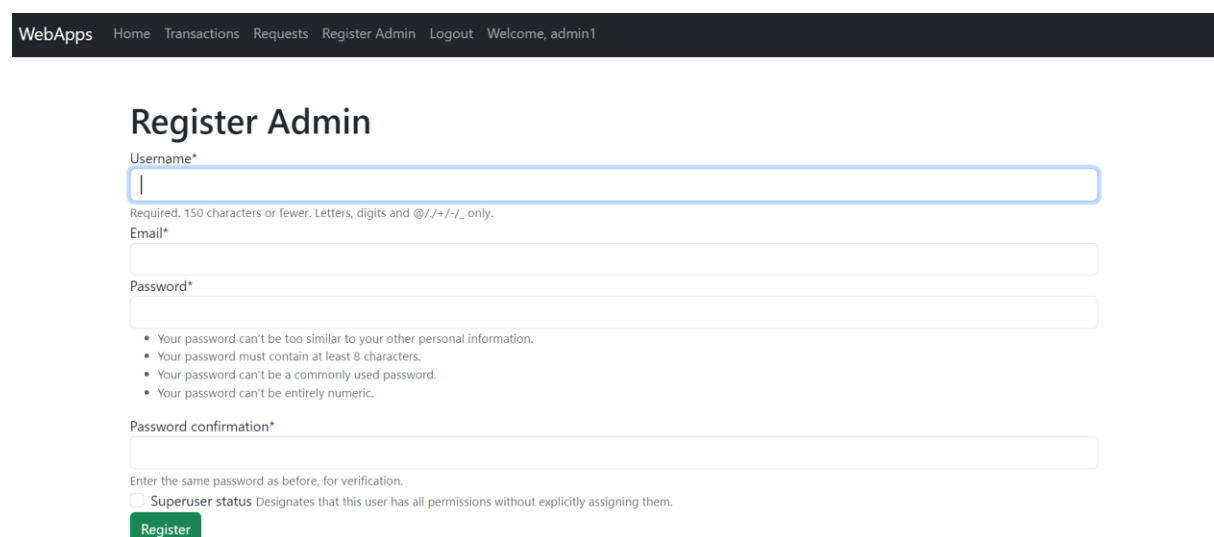
Admin

Screenshots showing views for the admin:

WebApps Home Transactions Requests Register Admin Logout Welcome, admin1

Fig.2.1 Admin navigation bar

WebApps Home Transactions Requests Register Admin Logout Welcome, admin1

Register Admin

Username*

[|]

Required. 150 characters or fewer. Letters, digits and @/./+/-/_ only.

Email*

[   ]

Password*

[   ]

- Your password can't be too similar to your other personal information.
- Your password must contain at least 8 characters.
- Your password can't be a commonly used password.
- Your password can't be entirely numeric.

Password confirmation*

[   ]

Enter the same password as before, for verification.

☐ **Superuser status** Designates that this user has all permissions without explicitly assigning them.

Register

Fig.2.2 Admin registration page

WebApps

Home
Balances

User	Currency	Balance
user1	GBP	1324
user2	USD	1028
user3	EUR	982

Fig.2.3 Admin home and view all users and balances page
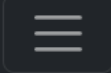
WebApps

Transactions

User	Amount	Direction	User	Date
user1	50	Sent to	user2	May 4, 2023, 8:18 p.m.
user1	100	Sent to	user3	May 4, 2023, 8:19 p.m.
user2	31	Sent to	user1	May 4, 2023, 9:54 p.m.
user2	400	Sent to	user1	May 4, 2023, 9:54 p.m.
user3	351	Sent to	user1	May 4, 2023, 9:55 p.m.
user1	108	Sent to	user2	May 4, 2023, 9:55 p.m.
user1	70	Sent to	user3	May 4, 2023, 9:55 p.m.

Fig.2.4 Admin view all user transactions page

WebApps ≡

Requests

User	Amount	Requested From
user1	280	user2
user1	8	user2
user1	30	user3
user1	12	user2

Fig.2.5 Admin view all user requests page

RestAPI
Screenshots showing examples of the RestAPI route in use

← → C ⓘ 127.0.0.1:8000/api/conversion/USD/GBP/200/

`{"rate": 0.8, "amount": 160.0}`

Fig.3.1 RestAPI currency conversion example 1

← → C ⓘ 127.0.0.1:8000/api/conversion/GBP/EUR/3001/

`{"rate": 1.14, "amount": 3421.14}`

Fig.3.2 RestAPI currency conversion example 2

← → C ⓘ 127.0.0.1:8000/api/conversion/EUR/USD/671/

`{"rate": 1.1, "amount": 738.1}`

Fig.3.3 RestAPI currency conversion example 3