

My touristic wallet

Practical assignment no. 2



Master in Informatics and Computing Engineering

Mobile Computing

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1 Architecture

The apps were made using Xamarin Forms, using C#. It was developed for Android and Universal Windows Platform.

SQLite was used as the local database.

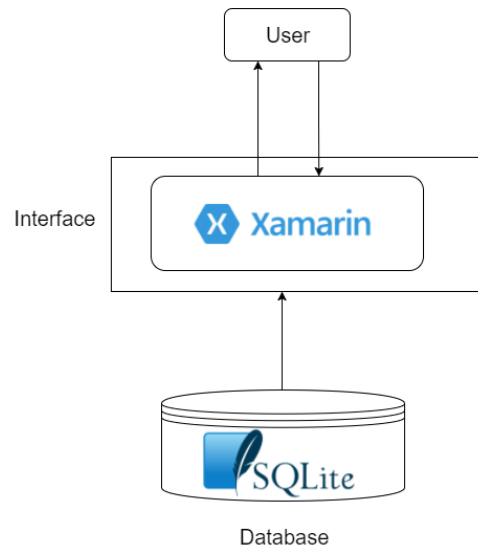


Figure 1: Architecture figure

2 Data Schema

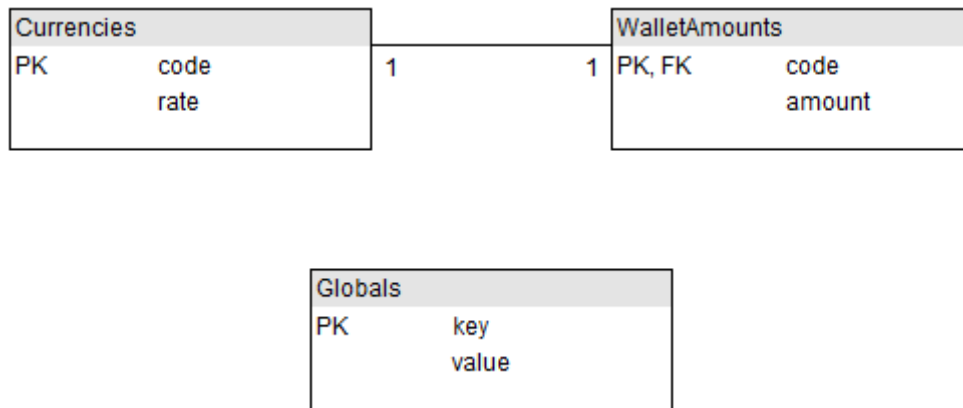


Figure 2: Database architecture

The database was created using the *sqlite-net-pcl* package for Xamarin Portable Apps, which creates the tables based on the C# classes that were used to represent the objects.

The **Currencies** table was used to store the current rates of the currencies that the application supports, the **WalletAmounts** table was used to store the amounts of each currency that the user currently has in its wallet, and the **Globals** table was used to store other information, such as the user's favourite currency.

3 Features

This section presents the most relevant features.

- **Updated rates** - The app gets the current updated currency rates online.
- **Offline rates** - When no internet connection is available, the app uses the last rates available.
- **Add amount** - The user can add an amount, selecting in which currency the amount is.
- **Remove amount** - The user can remove an amount, selecting in which currency the amount is. If the amount is higher than the current amount available in that currency, the user is presented with a visual warning.
- **Check wallet** - The user can check his current wallet. Meaning, he can check how much money he has in each currency, having a visual graphic display.
- **Check total amount** - The user can check his total amount of money in the wallet. Meaning, he can check how much money he has in a single currency, where every amount in each currency is converted to the favourite currency.
- **Favourite currency** - The user can check and change his favourite currency. This currency is the one presented by default in every page.
- **Change currency** - The user can change the current currency displayed in each page.
- **Check rates** - The user can check all current currency rates, in accordance to one currency. The user can change this currency, using a picker.

4 Tests

The tests were made by using the apps and in accordance with the features created.

Next we will present some of the performed tests.

- **Rates**

Check if the rates were consistent with the info coming from the web service.

Check if the app used persisted rates when no Internet connection was available.

- **Add/Remove Money**

Check if added/removed money showed in balances page.

Check if the amount added/removed is in accordance with the currency selected.

Check if the app prevents the user from removing more money than what he actually has.

- **Balances**

Check if the total amount is in accordance to the sum of all the currencies' amounts and its rates.

- **Favourite Currency**

Check if the saved favourite currency is selected by default in the "Add/Remove Money" page.

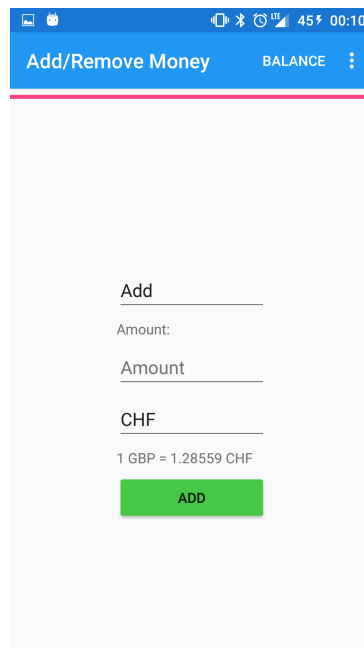
Check if the saved favourite currency is selected by default in the "Balance" page.

Check if the saved favourite currency is selected by default in the "Rates" page.

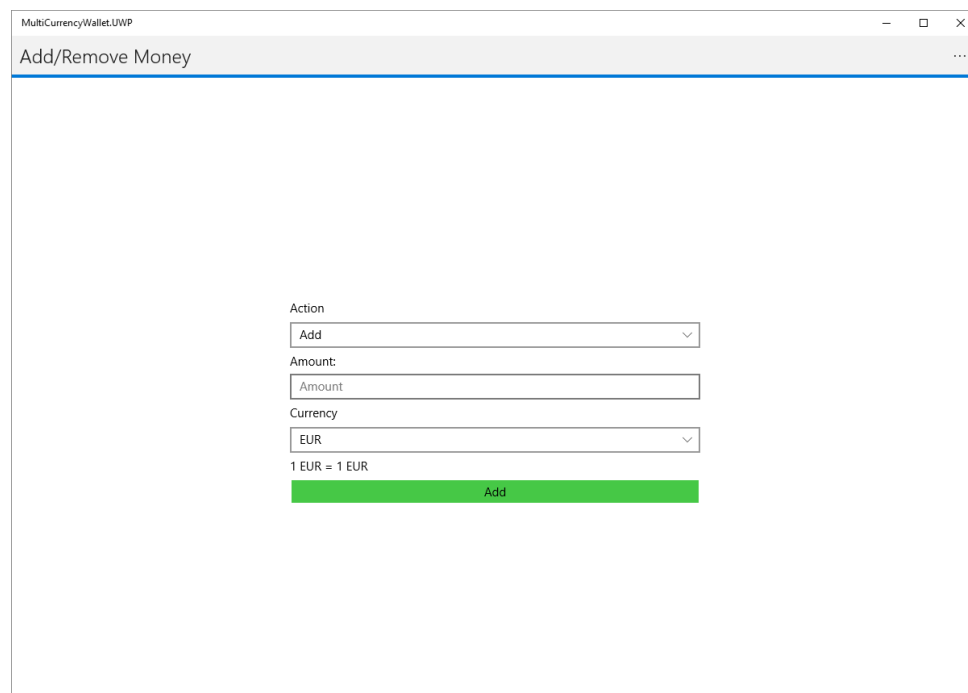
5 User Manual

5.1 Add and remove money page

The first screen the user will encounter is the add money page with the correspondent form.

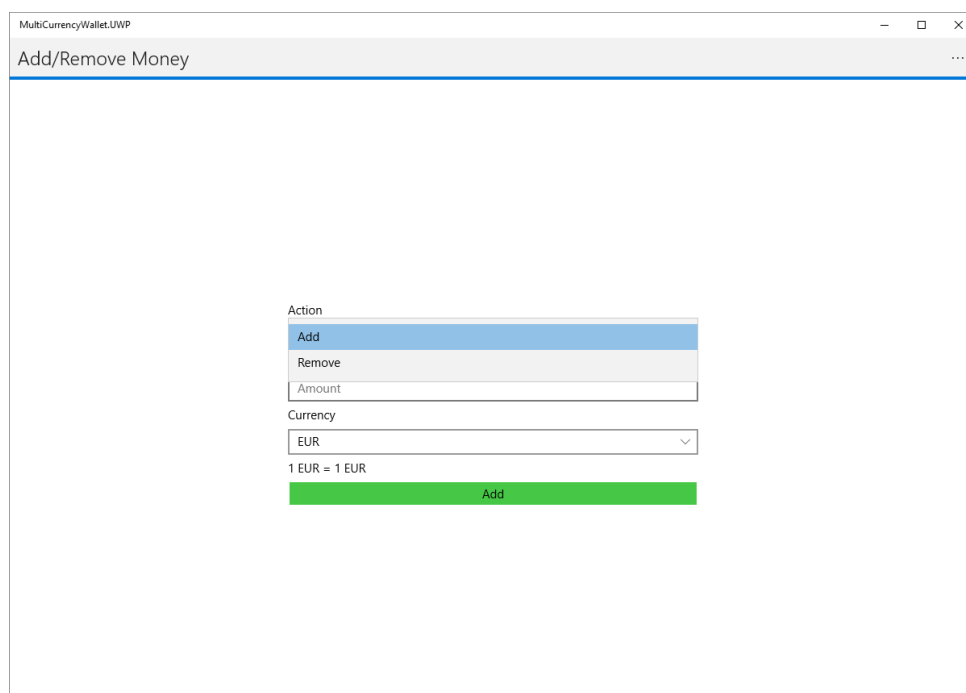
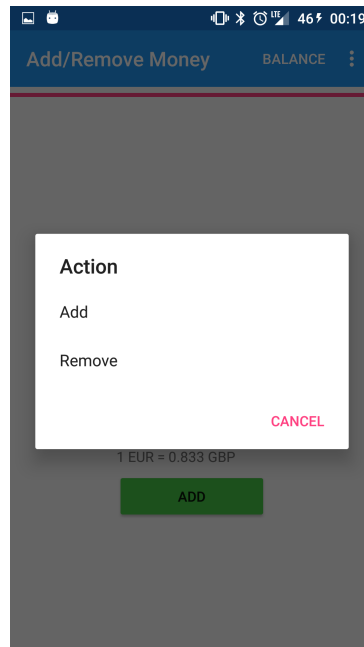


A screenshot of a mobile application interface. At the top, a blue header bar contains the text 'Add/Remove Money' on the left and 'BALANCE' with a three-dot menu icon on the right. Below the header, the main content area is light gray. It features a form with the following elements: a label 'Add' above an input field; a label 'Amount:' above another input field; a label 'Amount' above a third input field; a label 'CHF' above a fourth input field; and a text line '1 GBP = 1.28559 CHF'. At the bottom of the form is a green rectangular button with the text 'ADD' in white capital letters.

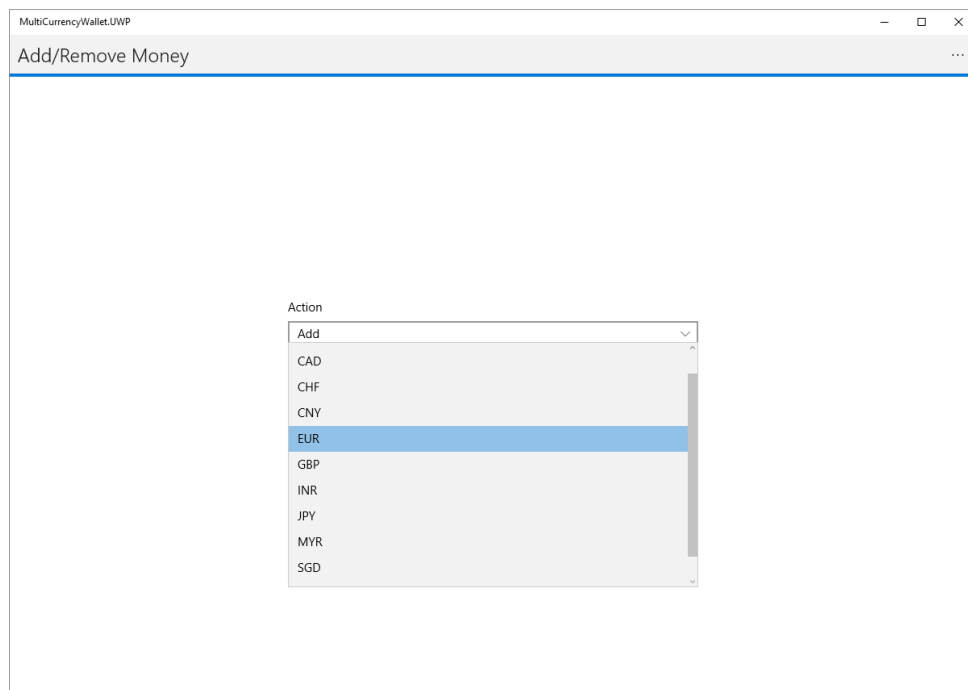
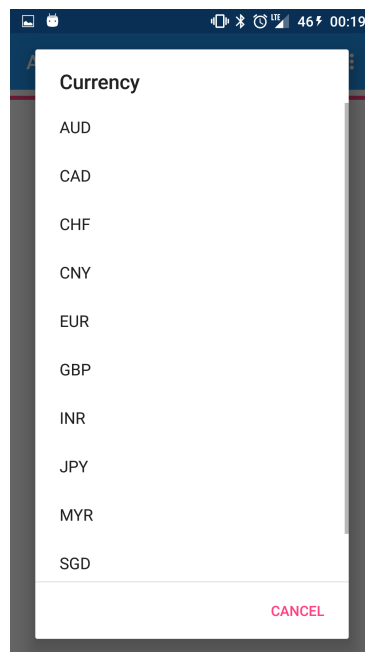


A screenshot of a web browser window displaying the 'Add/Remove Money' page. The browser's title bar shows 'MultiCurrencyWallet.UWP'. The page has a light gray header with the text 'Add/Remove Money' and a three-dot menu icon. The main content area is white and contains a form with the following elements: a label 'Action' above a dropdown menu showing 'Add'; a label 'Amount:' above an input field; a label 'Amount' above another input field; a label 'Currency' above a dropdown menu showing 'EUR'; and a text line '1 EUR = 1 EUR'. At the bottom of the form is a green rectangular button with the text 'Add' in white capital letters.

The user can select, using the picker, either to add or remove the amount.



The user can also select, using the picker, the currency in which the amount is in.



The user can remove amounts from his wallet using the following form.

Add/Remove MoneyBALANCE

Remove

Amount:
500

EUR

1 EUR = 1 EUR

REMOVE

MultiCurrencyWallet.UWP

Add/Remove Money

Action
Remove

Amount:
500

Currency
EUR

1 EUR = 1 EUR

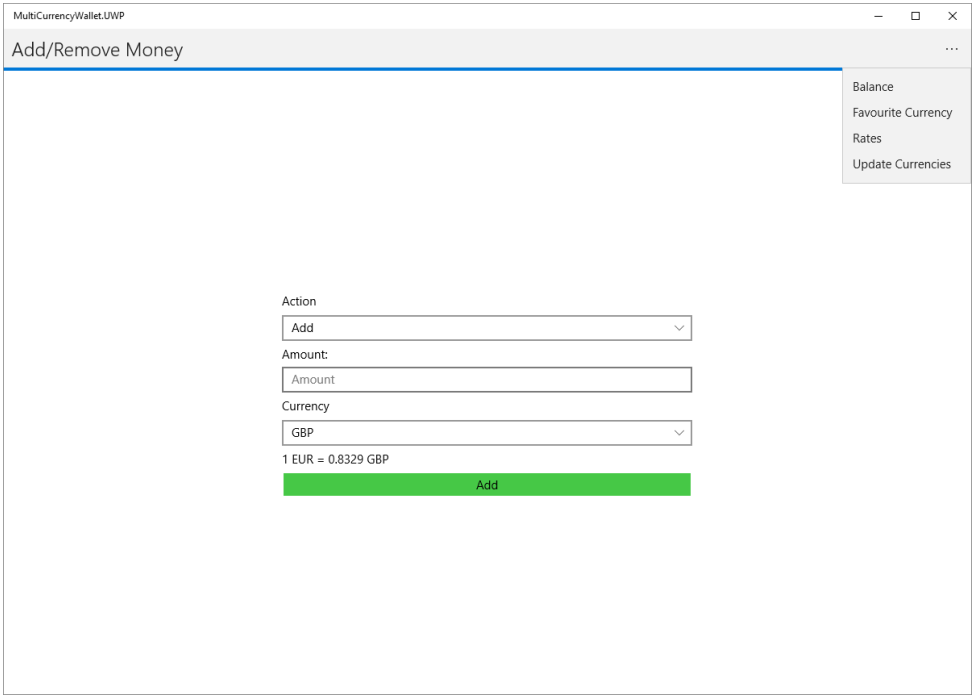
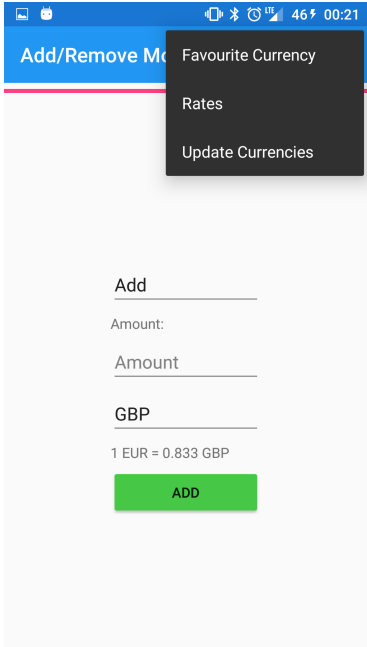
Remove

If the user tries to remove an amount bigger than his current amount in that currency, an error is displayed, and the action is not performed.

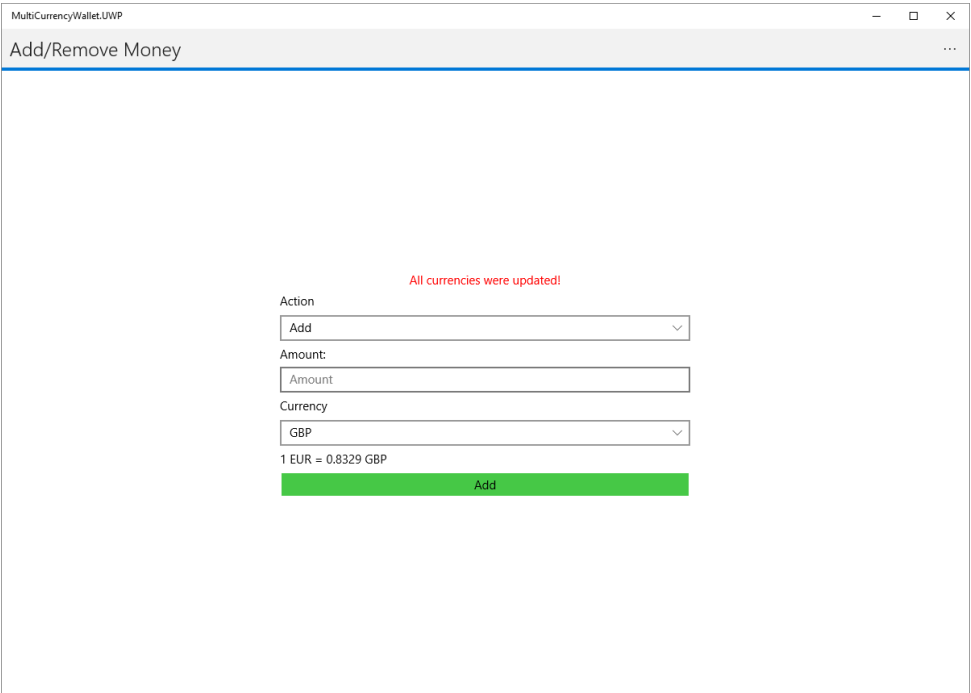
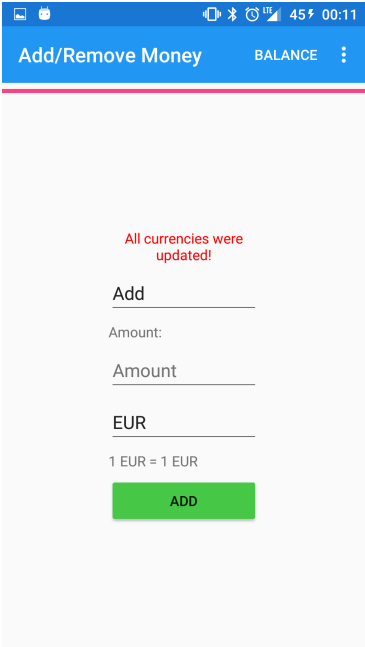
A screenshot of a mobile application interface. At the top, a blue header bar contains the text 'Add/Remove Money' and 'BALANCE' with a menu icon. Below the header, the main content area is light gray. In the center, there is a red error message 'Not enough money!'. Below this, the word 'Remove' is displayed above a horizontal line. Underneath, the text 'Amount:' is followed by a red error message 'Amount' above another horizontal line. Below that, the text 'EUR' is displayed above a horizontal line. Further down, the text '1 EUR = 1 EUR' is shown. At the bottom, there is a red button with the text 'REMOVE'.

A screenshot of a desktop web application interface. The browser window title is 'MultiCurrencyWallet.UWP'. The page has a header bar with the text 'Add/Remove Money'. The main content area is white. In the center, there is a red error message 'Not enough money!'. Below this, the word 'Action' is displayed above a dropdown menu with 'Remove' selected. Underneath, the text 'Amount:' is followed by a red error message 'Amount' inside a text input field. Below that, the text 'Currency' is displayed above a dropdown menu with 'EUR' selected. Further down, the text '1 EUR = 1 EUR' is shown. At the bottom, there is a red button with the text 'Remove'.

The user can use the menu in the toolbar to change the page.

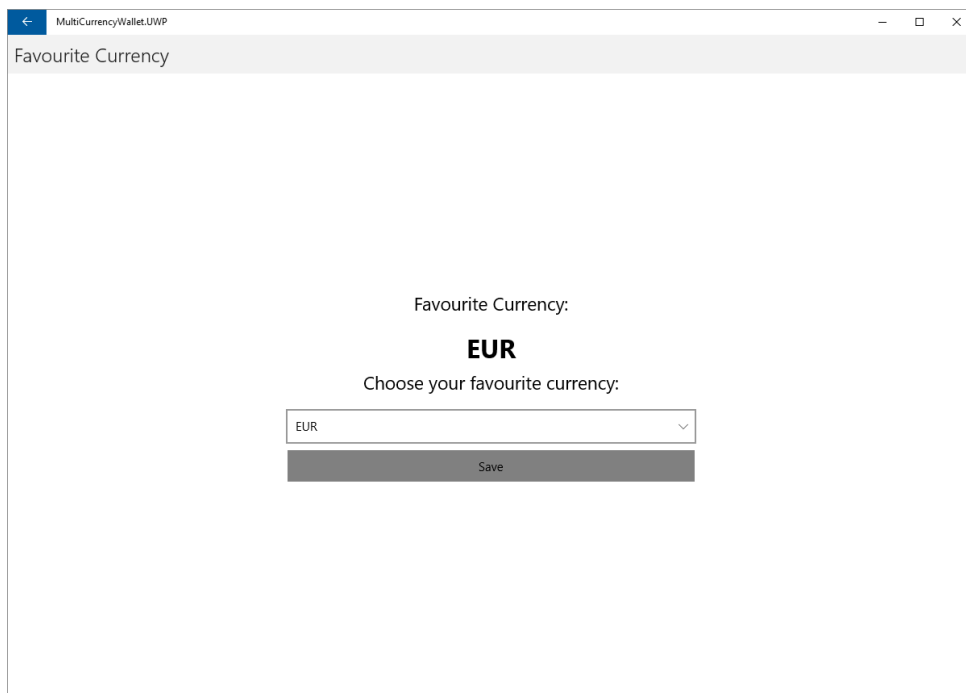
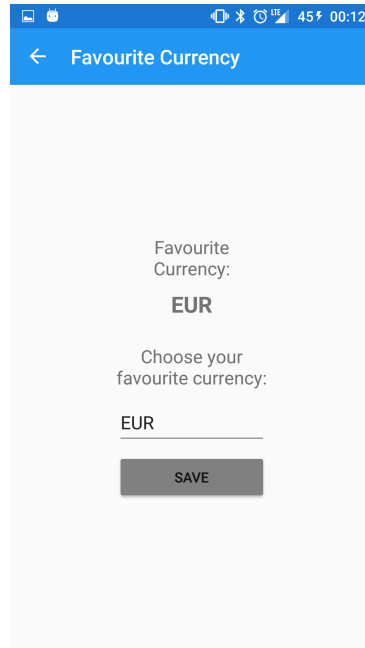


Selecting the update currencies option, the currencies are updated.



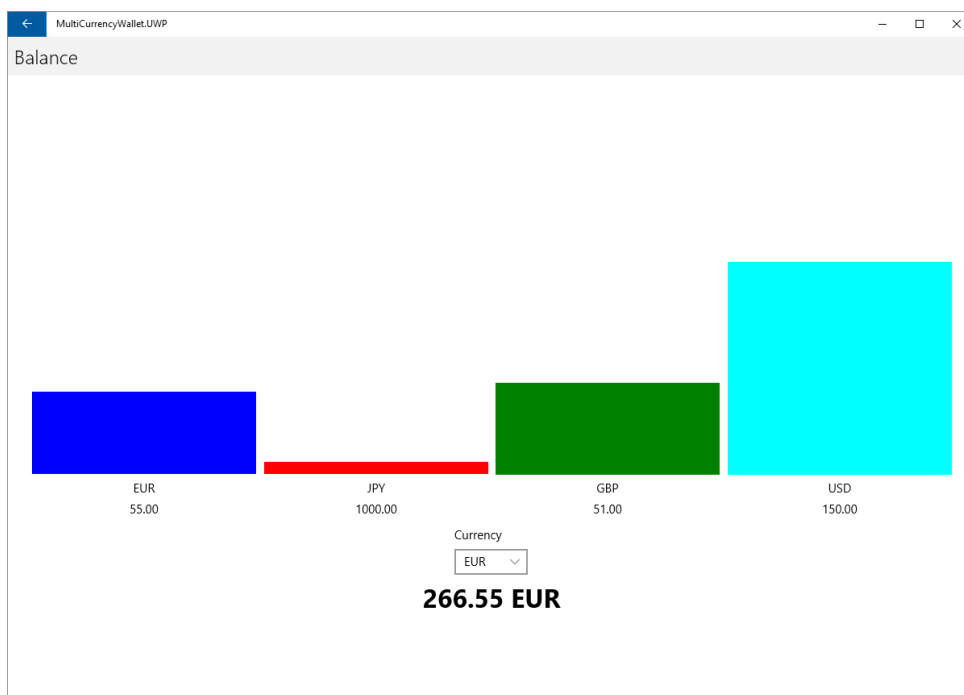
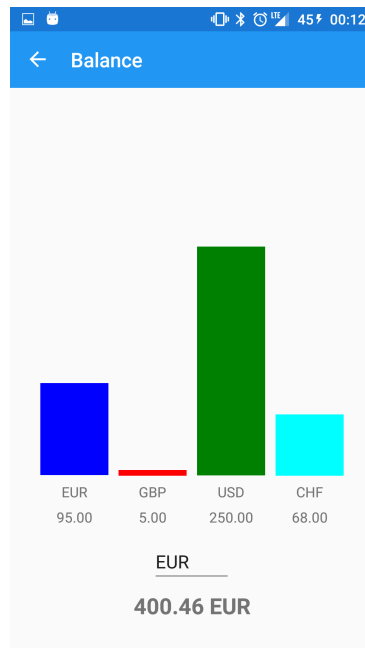
5.2 Favourites page

The user can select his favourite currency using this page. The favourite currency is then used as the default currency in all the pages.

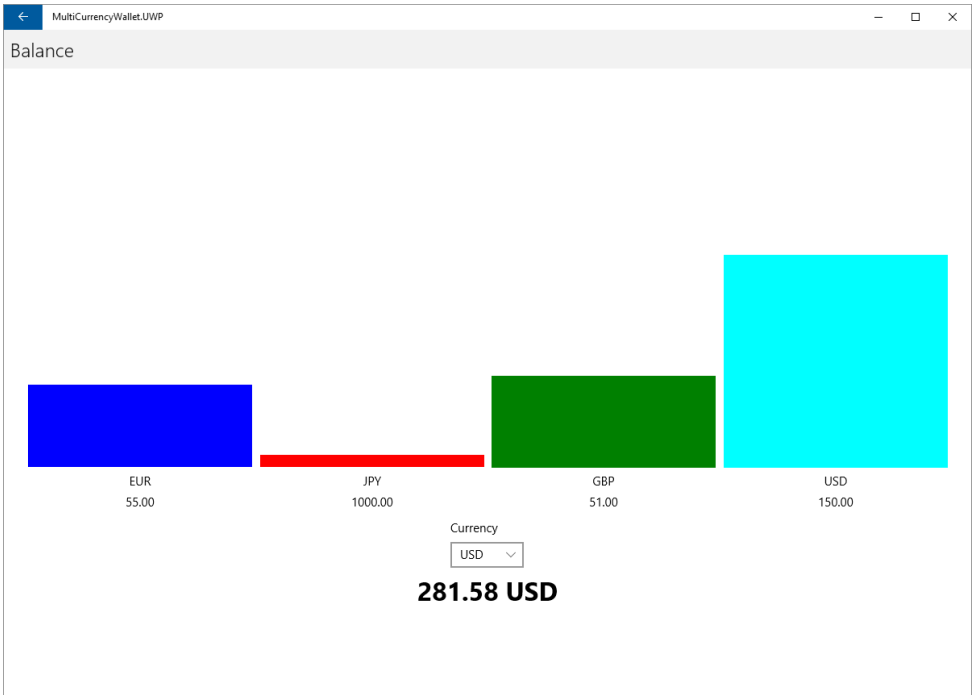
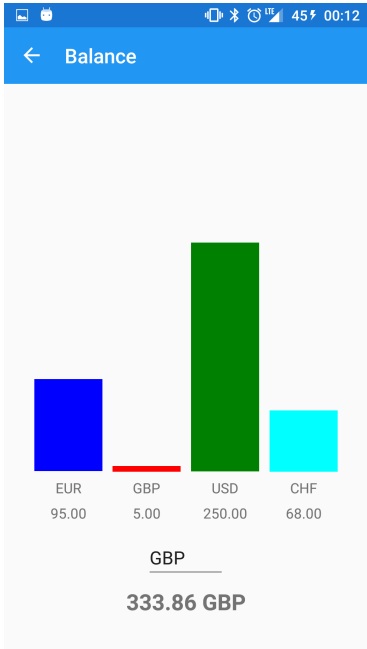


5.3 Balance page

The user can view, in a graphic form, the current amount he has, in each currency. The total amount is also displayed, with the appropriate conversion.

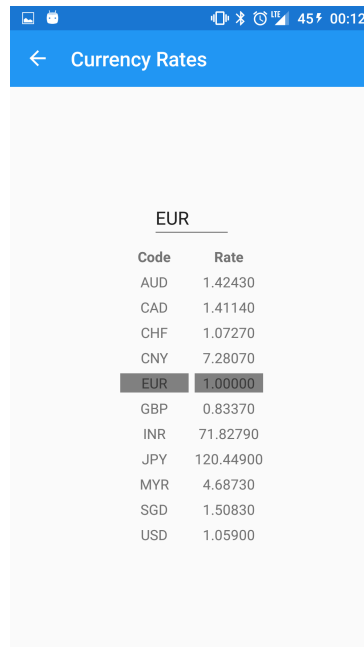


The user can select check his total amount in other currencies.



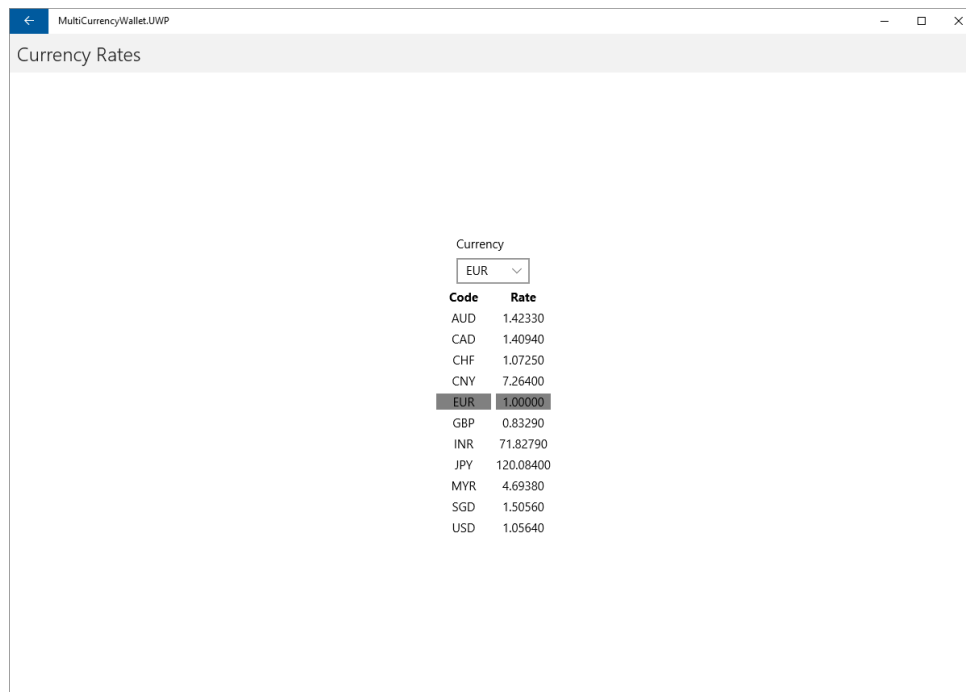
5.4 Currency rates page

The user can check the current currency rates.



A screenshot of a mobile application interface. At the top is a blue header bar with a back arrow and the text "Currency Rates". Below the header, the word "EUR" is centered and underlined. A table follows, listing various currencies and their exchange rates relative to the Euro. The "EUR" row is highlighted with a grey background.

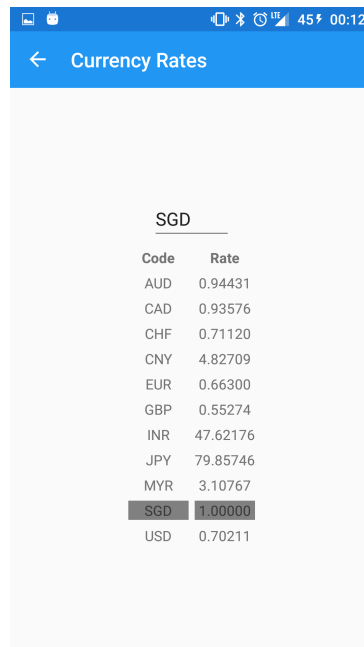
Code	Rate
AUD	1.42430
CAD	1.41140
CHF	1.07270
CNY	7.28070
EUR	1.00000
GBP	0.83370
INR	71.82790
JPY	120.44900
MYR	4.68730
SGD	1.50830
USD	1.05900



A screenshot of a web browser window displaying the "Currency Rates" page. The browser's address bar shows "MultiCurrencyWallet.UWP". The page has a grey header with a back arrow and the text "Currency Rates". Below the header, there is a "Currency" label and a dropdown menu currently set to "EUR". A table of currency rates follows, with the "EUR" row highlighted. The rates in this version are slightly different from the mobile app version.

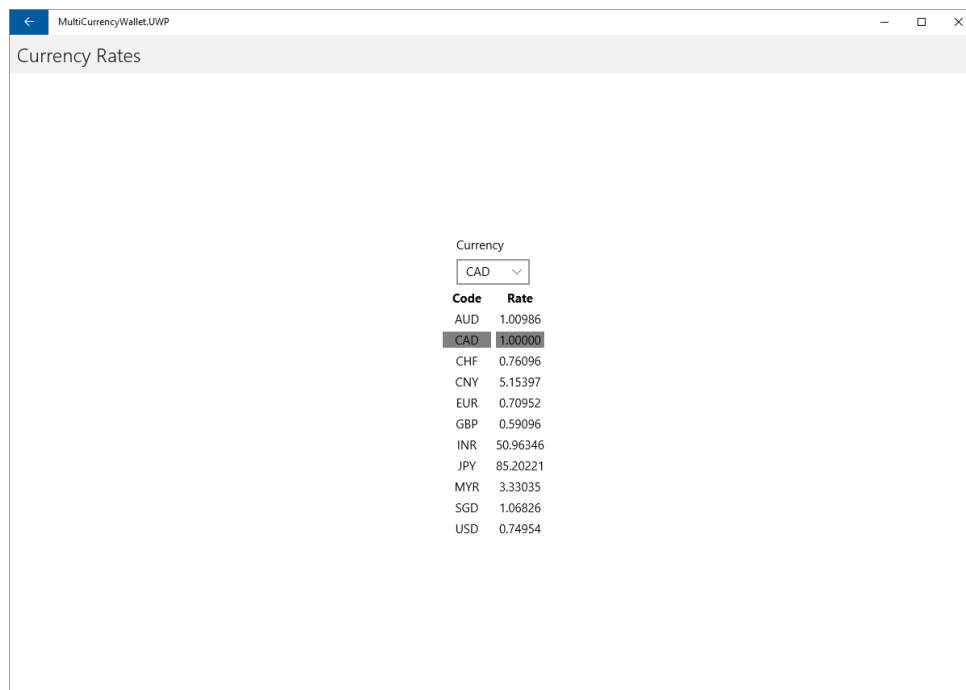
Code	Rate
AUD	1.42330
CAD	1.40940
CHF	1.07250
CNY	7.26400
EUR	1.00000
GBP	0.83290
INR	71.82790
JPY	120.08400
MYR	4.69380
SGD	1.50560
USD	1.05640

The user can check the current currency rates, selecting the currency he wants to compare the others to.



A screenshot of a mobile application interface. At the top is a blue header bar with a back arrow and the text "Currency Rates". Below the header, the text "SGD" is centered and underlined. Underneath, there is a table with two columns: "Code" and "Rate". The table lists various currencies and their corresponding rates relative to SGD. The row for "SGD" is highlighted with a grey background.

Code	Rate
AUD	0.94431
CAD	0.93576
CHF	0.71120
CNY	4.82709
EUR	0.66300
GBP	0.55274
INR	47.62176
JPY	79.85746
MYR	3.10767
SGD	1.00000
USD	0.70211



A screenshot of a desktop application window titled "MultiCurrencyWallet.UWP". The window has a title bar with standard minimize, maximize, and close buttons. The main content area has a header "Currency Rates". Below the header, there is a "Currency" label above a dropdown menu currently showing "CAD". Below this is a table with two columns: "Code" and "Rate". The table lists various currencies and their corresponding rates relative to CAD. The row for "CAD" is highlighted with a grey background.

Code	Rate
AUD	1.00986
CAD	1.00000
CHF	0.76096
CNY	5.15397
EUR	0.70952
GBP	0.59096
INR	50.96346
JPY	85.20221
MYR	3.33035
SGD	1.06826
USD	0.74954