



FUNCTIONAL ANALYSIS

Kala, your incomes and expenses management app

Short Description

Problem analysis, behaviour specification of the android app that is being developed and specification of the requirements that must do the software.

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3. Problem Analysis

The client, who is me, need an application to control all the expenses and incomes during a month, including cash and deposit money.

The users can create an account to follow all the exchanges of money using their smartphone, having a fast and simple access to the application.

The idea is to introduce the expense or the income and after that, see a summary of the exchange of money along the month.

4. Potential users

The android application focusses mainly to adults, because is the age when the people start to concert about their money.

The app will have two types of users, that will be specificized afterwards (see [section 6.1](#)).

5. Data source

The users will be created during the software life cycle. There will not be default users nor other data.

The system will keep the information in a cloud database. This is since the registered user needs access to his information in different smartphones.

6. Entities

All entities must be persistent.

All entities will have common traits, and some of them will have subentities with special traits.

6.1. User

6.1.1. Traits

- Identifier: Number
- Name: String of characters
- Email: String of characters
- Set of Months

6.2. Month

6.2.1. Traits

- Identifier: String of character (Month's name with the year)
- Set of Money Exchange
- Expended money: Number
- Incomed money: Number

6.3. Money Exchange

6.3.1. Características comunes

- Identifier: Number
- Type of money exchange: Expense or Income
- Scope of the money: Food, Leisure, Useful, Medicine u others
- Description: String of character
- Date: DD/MM/YYYY (DD → Day; MM → Month; YYYY → Year)

7. Requirements

7.1. Functional Requirements

7.1.1. Create Account

Name	Create Account
Id	FR-1
Type	Required
Description	The unregistered user can create an account, and must introduce the name, the email and a password.
Requirements	Access to the persistent system
Danger	Low

Table 1. FR-1 Create Account

7.1.2. Delete Account

Name	Delete Account
Id	FR-2
Type	Required
Description	The registered user can delete his account
Requirements	Access to the persistent system
Danger	Low

Table 2. FR-2 Delete Account

7.1.3. Log in

Name	Log in
Id	FR-3
Type	Required
Description	The registered user can access to the system using his name or email and password
Requirements	Access to the persistent system
Danger	Low

Table 3. FR-3 Log in

7.1.4. Recover password

Name	Recover password
Id	FR-4
Type	Optional
Description	The registered user can recover his password using their email to send an email
Requirements	Access to the persistent system
Danger	Low

Table 4. FR-4 Recover password

7.1.5. Log out

Name	Log out
Id	FR-5
Type	Required
Description	The registered user can log out of the system
Requirements	Access to the persistent system
Danger	Low

Table 5. FR-5 Log out

7.1.6. Enter money exchange

Name	Enter money exchange
Id	FR-6
Type	Required
Description	The registered user can enter information about the money exchange
Requirements	Access to the persistent system
Danger	Low

Table 6. FR-6 Enter money exchange

7.1.7. Define type of the money exchange

Name	Define type of the money exchange
Id	FR-7
Type	Required
Description	Now to enter the money exchange, the registered user must define if it is an expense or an income
Requirements	Access to the persistent system
Dangers	Low

Table 7. FR-7 Define type of the money exchange

7.1.8. Define scope of the money exchange

Name	Define scope of the money exchange
Id	FR-8
Type	Required
Description	Now to enter the money exchange, the registered user must define the scope, that can be food, leisure, useful, medication or other. (Open to increment or decresase the scopes)
Requirements	Access to the persistent system
Danger	Low

Table 8. FR-8 Define scope of the money exchange

7.1.9. Read record of money exchange

Name	Read record of money exchange
Id	FR-9
Type	Required
Description	The registered user can access to a record of the previous money exchange introduced
Requirements	Access to the persistent system
Danger	Low

Table 9. FR-9 Read record of money exchange

7.1.10. Edit introduced money exchange

Name	Edit introduced money exchange
Id	FR-10
Type	Required
Description	The registered user can edit previous money exchange
Requirements	Access to the persistent system
Danger	Low

Table 10. FR-10 Edit introduced money exchange

7.1.11. Delete introduced money exchange

Name	Delete introduced money exchange
Id	FR-11
Type	Required
Description	The registered user can delete a previous money exchange
Requirements	Access to the persistent system
Danger	Low

Table 11. FR-11 Delete introduced money exchange

7.1.12. Read summary of the introduced money exchange

Name	Read summary of the introduced money exchange
Id	FR-12
Type	Required
Description	When the registered user enters to the system, need to see a summary of the expense and income money along the month
Requirements	Access to the persistent system
Danger	Low

Table 12. FR-12 Read summary of the introduced money exchange

7.1.13. Read mensual report

Name	Read mensual report
Id	FR-13
Type	Required
Description	The registered user can see a mensual report with the expense and income of the different scopes
Requirements	Access to the persistent system
Danger	Low

Table 13. FR-13 Read mensual report

7.1.14. Change the currency

Name	Change the currency
Id	FR-14
Type	Optional
Description	<p>The application will let the registered user to change the currency. Default value will be €, “euro”; but you can change it to \$, “dolar”.</p> <p>This would be a visual change, not a currency conversion. The following may be added in the future.</p>
Requirements	
Danger	Low

Table 14. FR-14 Change the currency

7.1.15. Access to Help page

Name	Access to Help page
Id	FR-15
Type	Required
Description	The user can access to this page to see information about the application, some help to use the software and understand the functionality
Requirements	Access to the text file
Danger	Low

Table 15. FR-15 Access to Help Page

7.1.16. Send verification email

Name	Send verification email
Id	FR-16
Type	Optional
Description	When the unregistered user creates an account, the app must send a verification email
Requirements	Email system
Danger	Medium

Table 16. FR-16 Send verification email

7.1.17. Change language of the application

Name	Change language of the application
Id	FR-17
Type	Optional
Description	The unregistered and registered user can change the software language
Requirements	Access to the persistent system
Danger	Medium

Table 17. FR-17 Change language of the application

7.1.18. Show error login pop-up

Name	Show error login pop-up
Id	FR-18
Type	Required
Description	When the registered user sends incorrect credentials, the application will warn the error
Requirements	Access to the persistent system
Danger	Low

Table 18. FR-18 Show error login pop-up

7.1.19. Access to Home Page

Name	Access to Home Page
Id	FR-19
Type	Required
Description	After the registered user send the correct credentials, the registered user will access the home page
Requirements	Access to the persistent system
Danger	Low

Table 19. FR-19 Access to Home Page

7.1.20. Access to Configuration page

Name	Access to Configuration page
Id	FR-20
Type	Required
Description	The registered user can enter to configuration to edit some values of the application
Requirements	Access to the persistent system
Danger	Low

Table 20. FR-20 Access to Configuration Page

7.1.21. Edit Account

Name	Edit Account
Id	FR-21
Type	Optional
Description	The registered user can change his account information, as the name or the email
Requirements	Access to the persistent system
Danger	Medium

Table 21. FR-21 Edit Account

7.1.22. Show Terms and Conditions

Name	Show Terms and Conditions
Id	FR-22
Type	Required
Description	The application will show up a pop-up with the terms and conditions of the software when the registered user log in for the first time. It is necessary to accept to continue using the program
Requirements	
Danger	Low

Table 22. FR-22 Show Terms and Conditions

7.1.23. Show Data Protection clause

Name	Show Data Protection clause
Id	FR-23
Type	Required
Description	The application will show up a pop-up with the Data Protection clause of the software when the registered user had accepted the Terms and Conditions. It is necessary to accept to continue using the program
Requirements	
Danger	Low

Table 23. FR-23 Show Data Protection clause

7.1.24. Define value of the exchange

Name	Define value of the exchange
Id	FR-24
Type	Required
Description	Now to enter the money exchange, the registered user must define the value of the exchange.
Requirements	Access to the persistent system
Danger	Low

Table 24. FR-24 Define value of the exchange

7.1.25. Define description of money exchange

Name	Define description of money exchange
Id	FR-25
Type	Optional
Description	Now to enter the money exchange, the registered user can add a description of the exchange.
Requirements	Access to the persistent system
Danger	Low

Table 25. FR-25 Define description of money exchange

7.2. Non Functional Requirements

7.2.1. Oriented to smarth phones

Name	Oriented to smarth phones
Id	NFR-1
Type	Required
Description	The application is focused to smarth phone users, because the objective of the application is an easy access to the data about the money exchange of the registered user

Table 26. NFR-1 Oriented to smarth phones

7.2.2. The app must run in Android 5 or upper

Name	The app must run in Android 5 or upper
Id	NFR-2
Type	Required
Description	In order for the application to be used by the largest number of Android users, it has to be in older version of Android

Table 27. NFR-2 The app must run in Android 5 or upper

7.2.3. The software must be implemented with Kotlin

Name	The software must be implemented with Kotlin
Id	NFR-3
Type	Required
Description	Kotlin is, currently, the programming language more adequate to create and Android software due to the support it has in this platform

Table 28. NFR-3 The software must be implemented with Kotlin

7.2.4. The application needs to connect with a cloud data base

Name	The application needs to connect with a cloud data base
Id	NFR-4
Type	Required
Description	To keep the data introduced by the user, this information must be saved in some cloud data base, to be possible to access easily with another smarth phone with the application

Table 29. NFR-4 The application needs to connect with a cloud data base

7.2.5. Languages Required

Name	Languages Required
Id	NFR-5
Type	Required
Description	The mainly languages available are Spanish and English. It is possible to extends the catalogue of languages available

Table 30. NFR-5 Languages Required

7.2.6. GUI must be minimalist and user-friendly

Name	GUI must be minimalist and user-friendly
Id	NFR-6
Type	Required
Description	The GUI must be minimalist to be simple and intuitive. To be user-friendly, all type of people, can use this application without any physic or mentally limitation

Table 31. NFR-6 GUI must be minimalist and user-friendly

7.2.7. Needs an-email system

Name	Needs an-email system
Id	NFR-7
Type	Required
Description	To send any notification to the registered user, is necessary an-email system

Table 32. NFR-7 Needs an-email system

7.2.8. Protection and Security for Registered User Data

Name	Protection and Security for Registered User Data
Id	NFR-8
Type	Required
Description	All the data introduced by the registered user will be secure and protected

Table 33. NFR-8 Protection and Security for Registered User Data

7.2.9. Use of Jetpack Compose

Name	Use of Jetpack Compose
Id	NFR-9
Type	Required
Description	This technology will be used to create the user interface.

Table 34. NFR-9 Use of Jetpack Compose

8. Use Case Diagrams

The next Use Cases Diagrams portray the different requirements and their relations with actors.

All the functional requirements have associated a use case with their id (see Section 5.1).

All the actors are briefly described at the Section 6.1 of this document.

8.1. Actor definition

8.1.1. Unregistered User

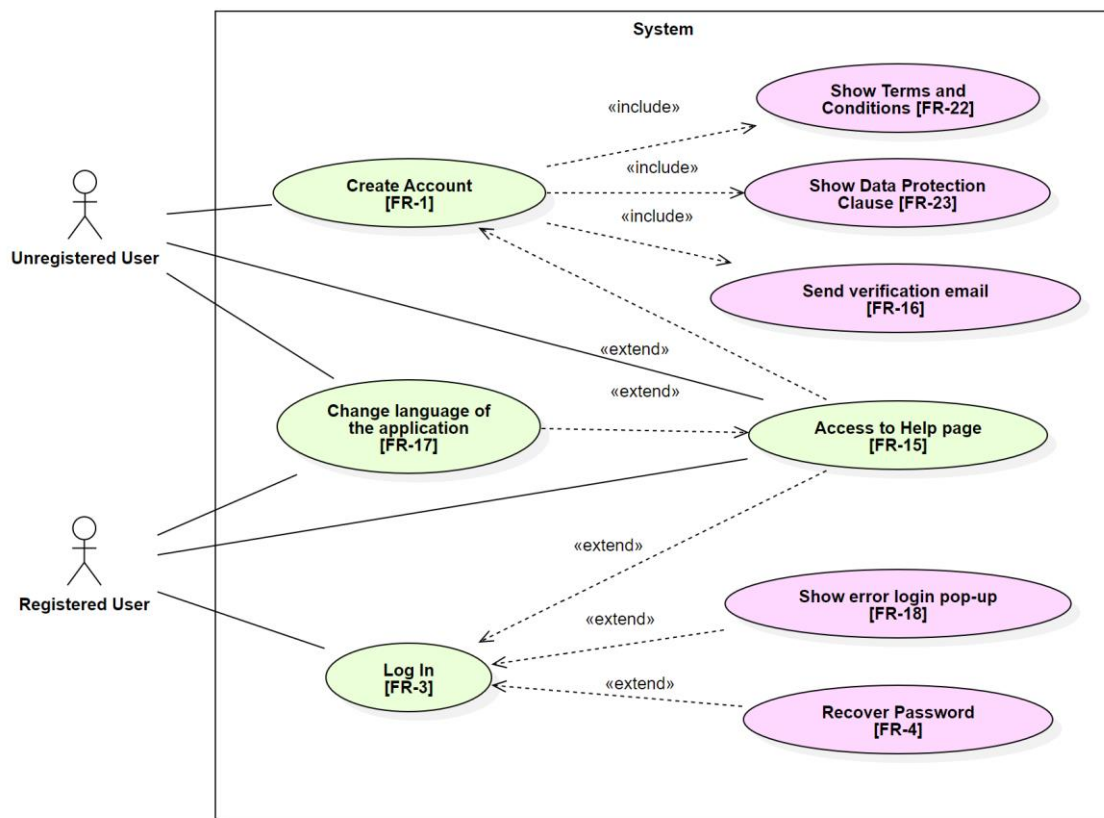
This type of user only can create an account and change the language of the application.

8.1.2. Registered User

This type of user can use all the functionality of the software without any limitation. Before that, they need to log in.

8.2. Access System

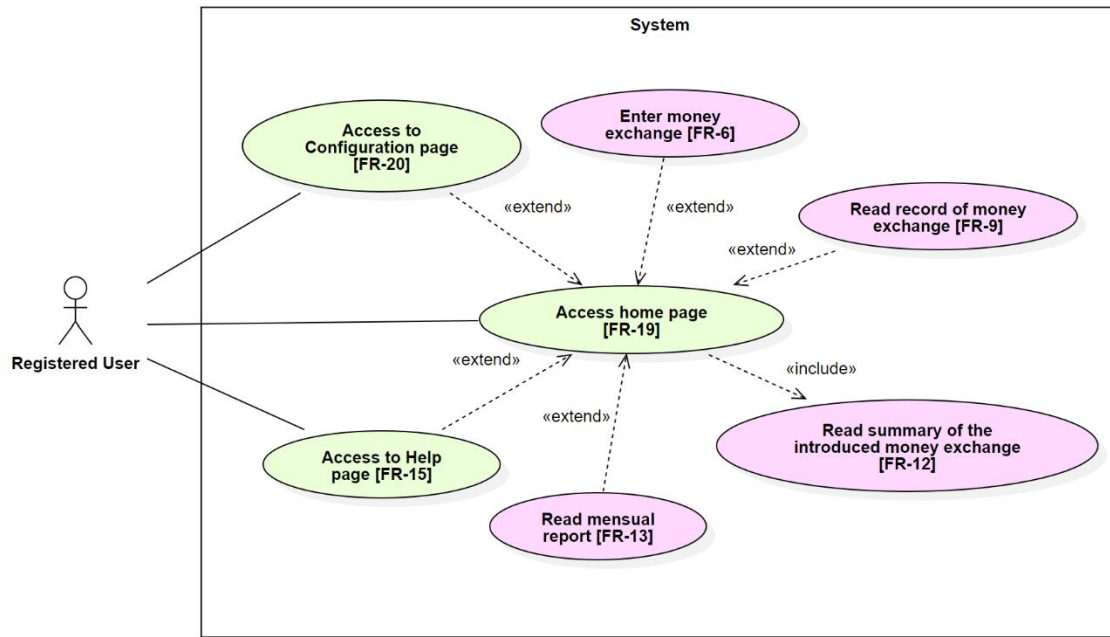
This use case diagram represents the relation with the system of the two different users, being mainly about the access system.



Use Case Diagram 1. Access system

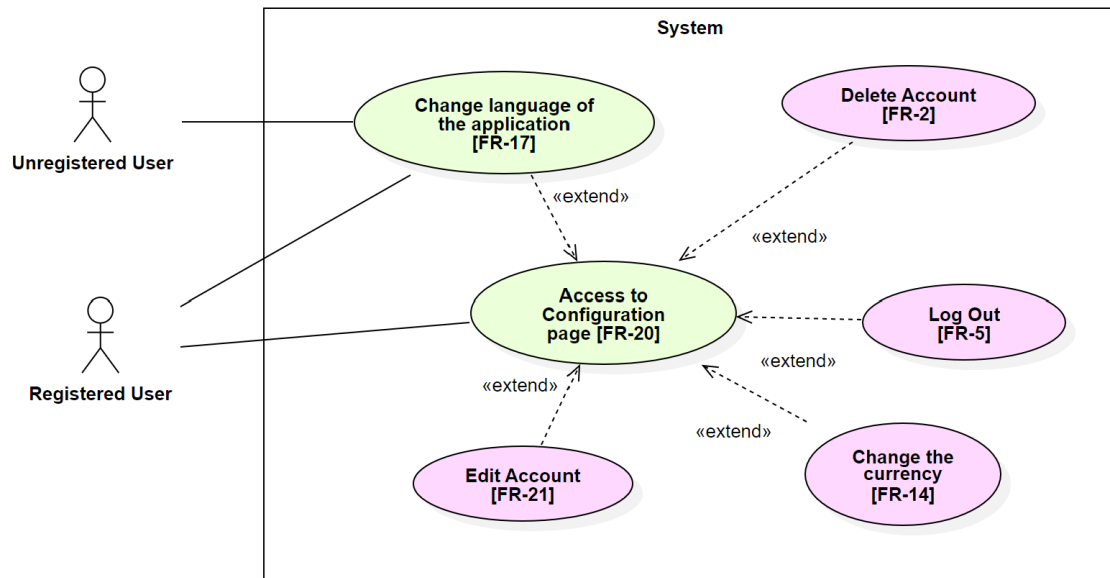
8.3. Home Page

The next use case diagram shows the functionality of the home page of Kala, with the principal action, FR-6: Enter money exchange, the core of the application.



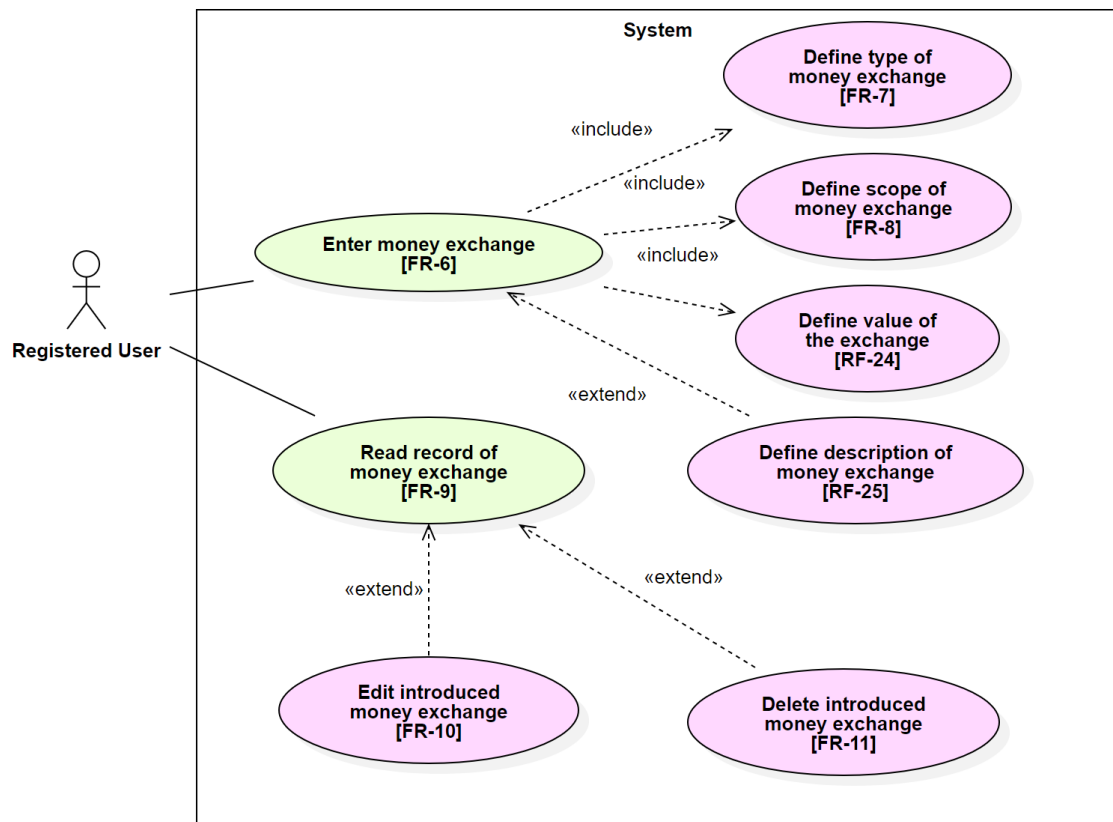
8.4. Configuration Page

The following use case diagram displays all the actions that registered user, can do in the configuration page.



8.5. CRUD of Money Exchange

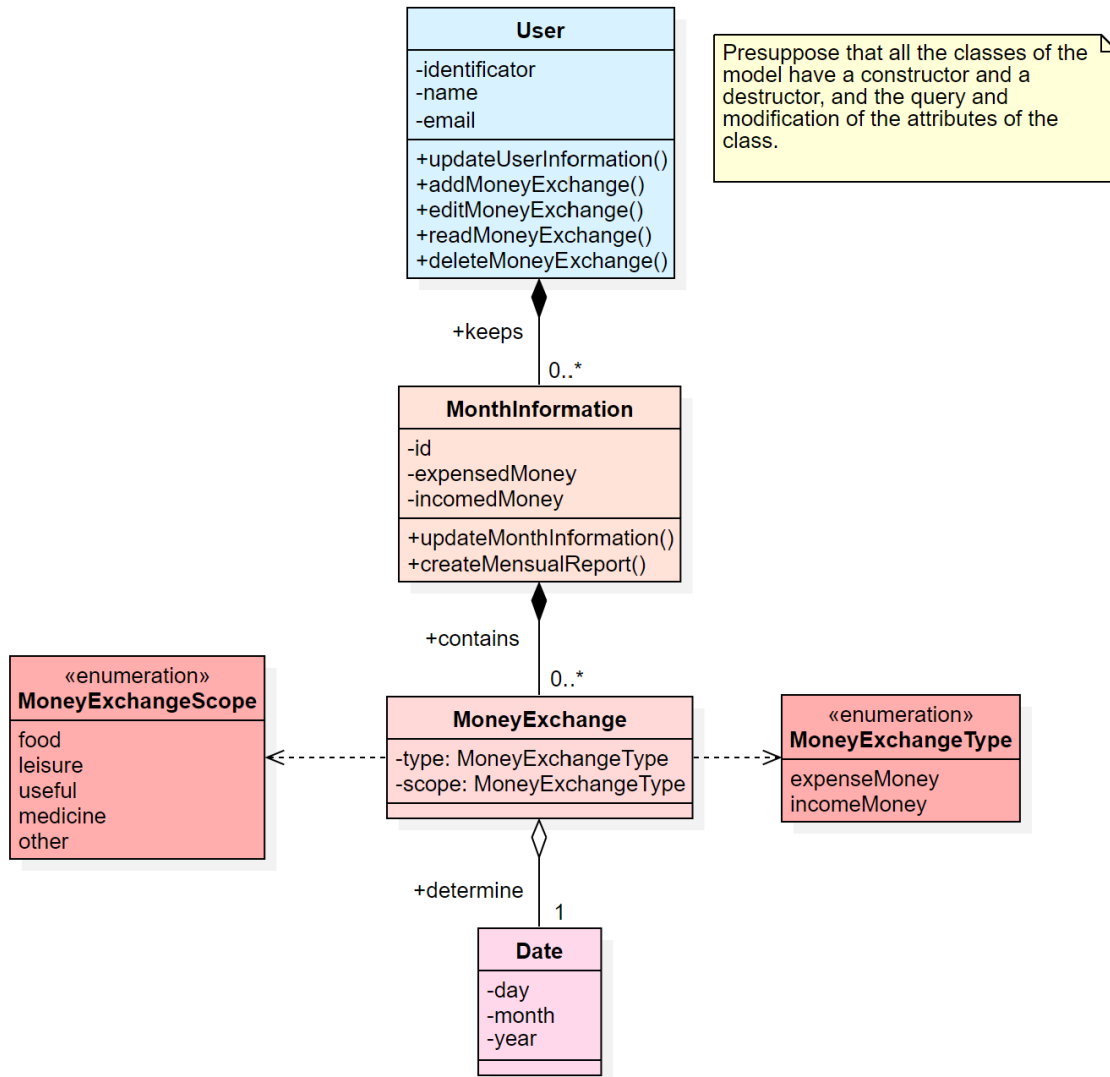
This use case diagram explains the functionality of the CRUD system of the software, and how the registered user is related to it.



Use Case Diagram 4. CRUD of money exchange

9. Class Diagram

This class diagram represents the body of the android application, and how everything is related among them.



Class Diagram 1. Main

9.1. Classes

9.1.1. User

The User class will gather all the MonthInformation with their corresponding MoneyExchange. It will keep the name and email address, with a unique ID.

9.1.2. MonthInformation

The MonthInformation class will have all the money exchange along the month, with the mensual report.

9.1.3. MoneyExchange

The MoneyExchange class will storage all the information about one money exchange.



9.1.4. MoneyExchangeType

The MoneyExchangeType enum will determine the only two types of money exchange: expensed or income money, to classify them.

9.1.5. MoneyExchangeScope

The MoneyExchangeScope enum will decide the scopes of money exchange. It is possible to extend in the future the scopes, but currently they are the next ones: Food, Leisure, Useful, Medicine and Others.

9.1.6. Date

The Date class will allow the organization of months of the application.