

Universidad de las Fuerzas Armadas ESPE



Specification of Software requirements

Project: Simulator Health Cody + (2021)

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Revision history

Date	Review	Description	Author
20/01/2021	0.1	Software requirements specification	Software Developer

Document validated by the parties as of: [--/--/----]

For the client	By the supplying company
Fdo. D./	Fdo. D./

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1 Introduction

System that connects people with their favorite testing laboratory, streamlining processes and avoiding possible infections.

1.1 Purpose

Help people to have a prediction of a possible contagion, so that later they can connect with the laboratory of their choice to schedule a rapid test or pcr, to avoid the crowding of people in the same place. In addition, the administrator will have control of inventory, itinerary and results

1.2 Scope

Our project is called "Health Cody +", a system that links the user with the test laboratory.

The user interface allows you to obtain a prediction of a possible contagion, schedule appointments, and obtain results after taking the test in person.

While the administrator (laboratory) can manage an inventory, control the schedule and manage patient results.

1.3 Personnel involved

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1.4 Definitions, acronyms and abbreviations

User: is a person who uses a computer or a network service.

Administrator: is the person who is in charge of carrying out the administrative task through planning, organization, direction and control

Laboratory: are those fixed or mobile places that have the technical, material and human capacity to carry out measurements, analysis or determine the characteristics of materials, products or equipment according to established specifications.

PCR test: is a diagnostic test that allows to detect a fragment of the genetic material of a pathogen.

Quick test: identify the presence of antibodies or antigens and show the result qualitatively, positive or negative.

1.5 References

World Health Organization. Laboratory Testing Strategy Recommendations for COVID-19.; 2020

Abbott. Abbott launches molecular point-of-care test to detect novel coronavirus in as little as five minutes. Vol 564.2020.
<https://abbott.mediaroom.com/2020-03-27-Abbott-Launches-Molecular-Point-of-Care-Test-to-Detect-Novel-Coronavirus-in-as-Little-as-Five-Minutes>.

Carbone M, Green JB, Bucci EM, Lednicky JA. Coronaviruses: Facts , Myths , andHypotheses. J Thorac Oncol. 2020.

1.6 Summary

System called "Health Cody Plus" that connects people with their favorite test laboratory, where the user provides prediction of COVID-19 contagion, scheduling of appointments and visualization of results, while the Administrator allows to manage the inventory, control the itinerary and manage PCR and rapid test results.

2. General description

The system mainly seeks to help people to obtain an accurate prognosis of a possible contagion of covid 19 and later to book an appointment in the laboratory to do the pcr or rapid test. The system will carry out activities such as taking surveys and giving its results obtaining a diagnosis for each patient and also the possibility of scheduling appointments for the laboratory of your choice.

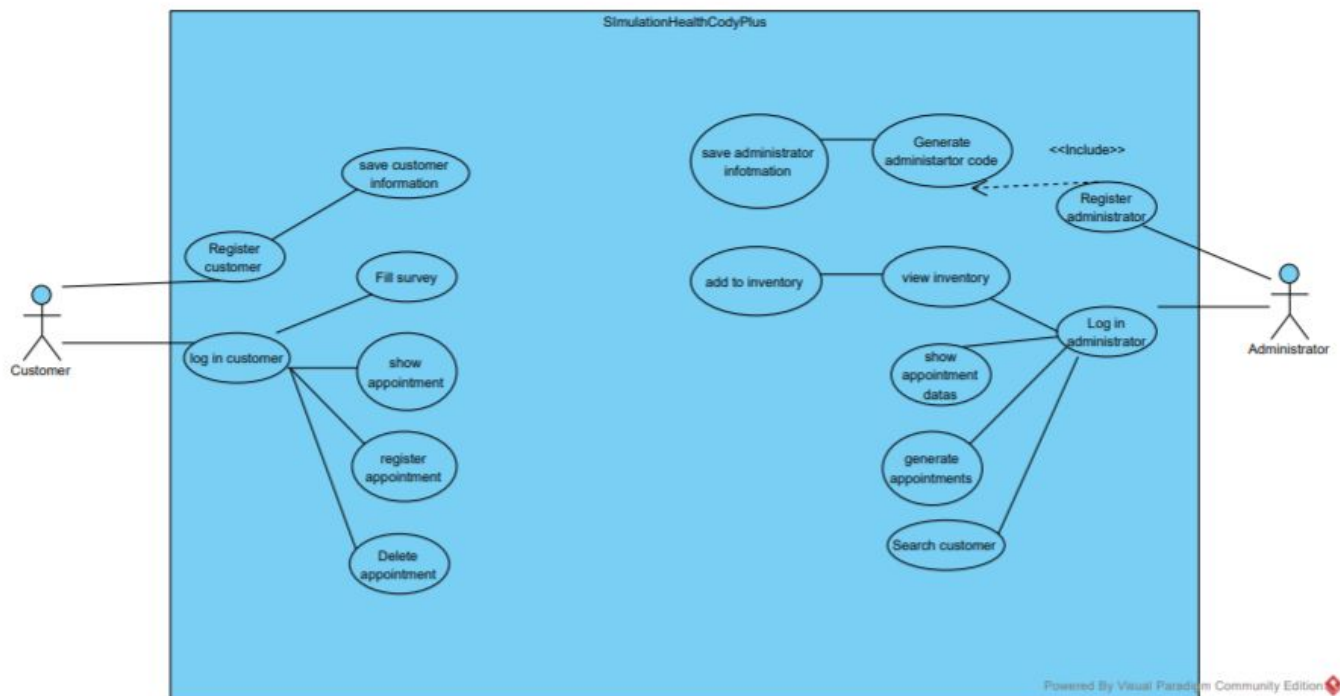
2.1 Product perspective

The system is being developed by the entire work team, it is a totally independent system, that is to say, it does not depend on other systems, much less larger systems. This system seeks that users can feel good through its interface, conducting easy and understandable surveys for the user and giving an accurate diagnosis to the patient.

2.2 Product functionality

The system will have a simple console interface to be used and, in conclusion, it can be understood at a glance by all users who will use it in the future.

USE CASE DIAGRAM



2.3 User characteristics

Type of user	Customer
Training	Basic education
Abilities	Ease of handling Windows Operating System.
Activities	Register in the system, Login, Fill out the survey, Schedule appointment.

Type of user	Administrator
Training	Higher education
Abilities	Ease of handling Windows Operating System.
Activities	Register in the system, Login with a code, Administrate the inventory, Administrate the appointments.

2.4 Restrictions

- The system must be developed in Java programming language.
- Information about users must be stored.
- The interface should be user friendly and easy to use.
- The system must be suitable for users over 16 years old.
- The system can only be used with a Windows Operating System

2.5 Assumptions and dependencies

- The program that will be delivered will mainly work in the console and then it will be transferred to the graphical interface.
- As soon as you choose to use a database, you must modify the system connection.

2.6 Predictable evolution of the system

After a while, the system will be modified in graphical mode for the greater benefit of the users who use it, as well as transferring their data to a more sophisticated database.

3 Specific requirements

RF 1 Register users

RF 1.1 Register (customer)

The system will allow the user (customer) to register requesting personal data

Requirement number	1.1
Requirement name	Register customer
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 1.2 Register (Administrator)

The administrator must have a special code that identifies him as a system administrator.

Requirement number	1.2
Requirement name	Register administrator
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 2 log in users

RF 2.1 log in (customer)

Once registered, the user will be able to log in and access the other features of the system

Requirement number	2.1
Requirement name	log in (customer)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction

Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 2.2 log in (administrator)

Once registered, the administrator will be able to log in and access the other system functions as an administrator.

Requirement number	2.2
Requirement name	log in (Administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 3 Fill survey (customer)

The client must fill out a survey with questions related to covid-19

Requirement number	3
Requirement name	Fill survey
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 4 Schedule Appointment (customer)

RF 4.1 see available appointment times (customer)

the user will be able to see the schedules that are available to be able to schedule their appointment

Requirement number	4.1
--------------------	-----

Requirement name	See available appointment times (customer)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 4.2 view scheduled appointments (customer)

The client will be able to see the appointments they have scheduled and decide if they can cancel them

Requirement number	4.2
Requirement name	view scheduled appointments (customer)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 5 Check result (customer)

The results of the tests to be performed will reach the user in this section

Requirement number	5
Requirement name	Check result (customer)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (customer)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 6 view medical history (administrator)

The administrator will be able to see the client's medical history

Requirement number	6
Requirement name	view medical history (administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction

Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 7 View scheduled appointments (administrator)

The administrator will be able to see the appointments scheduled by the client users

Requirement number	7
Requirement name	View scheduled appointments (administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 8 Manage inventory

RF 8.1 view available inventory (administrator)

The administrator will be able to see in the inventory of the products

Requirement number	8.1
Requirement name	View inventory (administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 8.2 Manipulate inventory (administrator)

The administrator can add delete and modify products in the inventory

Requirement number	8.2
Requirement name	Manipulate inventory (administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction

Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

RF 9 Generate reports (administrator)

The administrator will be able to generate inventory reports and appointments

Requirement number	9
Requirement name	Generate reports (administrator)
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Restriction
Requirement source	User (administrator)
Priority of requirement	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/Desired <input type="checkbox"/> Low/Optional

3.1 Common interface requirements

3.1.1 Software interfaces

The system uses the system console, preferably windows or also other operating systems (Linux, MC OS)

3.1.2 Communication interfaces

In order to use the program, the user must have the JAR and the JRE installed

3.2 Functional requirements

3.2.1 Functional requirement 1

- Register users: The system will allow the user to register (administrator, customer)

- ❖ Register administrator: The system will allow you to register as an administrator with an identification code provided by the company and also personal data.
- ❖ Register client: The system will allow registering client requesting their personal data

3.2.2 Functional requirement 2

- Log in users : Users must identify themselves in order to access the other functions
 - ❖ Log in Administrator: Administrators must identify themselves in the administrator section to access the functions that correspond to them
 - ❖ Log in customers: Customers must login with a username and password to access the other functions

3.2.3 Functional requirement 3

- Fill survey : Customers must fill out a survey with questions related to covid 19 and according to that a report will be generated with their health status

3.2.4 Functional requirement 4

- Schedule Appointment :Clients will be able to schedule an appointment for a test
 - ❖ See available appointment times: Users will have available the hours in which the tests will be carried out and thus be able to reserve a shift
 - ❖ view scheduled appointments: Customers when scheduling an appointment will be able to see the detailed information of the appointment and decide to cancel it

3.2.5 Functional requirement 5

- Check result :In this section the client will be able to see the results of the tests that have been carried out

3.2.6 Functional requirement 6

- view medical history :The administrator can search the medical history of a client

3.2.7 Functional requirement 7

- View scheduled appointments: The administrator will be able to see the appointments that are scheduled in a day or week

3.2.8 Functional requirement 8

- Manage inventory :The administrator will be in charge of managing the inventory
 - ❖ view available inventory: The Administrator will be able to see the stock of the products
 - ❖ Manipulate inventory: The Administrator will be able to perform the actions such as add, delete and modify the inventory

3.2.9 Functional requirement 9

- Generate reports :The administrator will be able to generate medical inventory reports and appointments

3.3 Non- Functional Requirements

RNF 01 Execution_Time

The execution_time is necessary to know if the software is running good.

Identification of the requirement.	RNF 01
Requirement Name.	Execution time
Features	The user executes the application.
Requirement Description	After the user executes the application, the time that takes the application to execute.
Priority requirement	High

RNF 02 Survey_Percentage (Customer)

The percentage of the survey is necessary to know if the user needs or not a scheduled appointment.

Identification of the requirement.	RNF 02
Requirement Name.	Survey percentage
Features	The user obtains a percentage after that he fills the survey.
Requirement Description	The percentage of the survey is necessary to know if the user needs a schedule appointment.
Priority requirement	High

RNF 03 Exceptions

The exception is an important part of the software, because if the exception doesn't work correctly, the software falls down.

Identification of the requirement.	RNF 03
Requirement Name.	Exceptions
Features	The user such as the administrator or the patient does something incorrectly in the software.
Requirement Description	The software needs to make an exception and continue with his flow.
Priority requirement	High

RNF 04 User_documentation

The software needs to contain user documentation because if the user doesn't know what they need to do, the user documentation is to be a help for this.

Identification of the requirement.	RNF 04
Requirement Name.	User documentation
Features	The user needs documentation to use the application.
Requirement Description	The application is going to do everything that is written in the user documentation.
Priority requirement	High

RNF 05 Save information

The software needs to save information such as inventory and users.

Identification of the requirement.	RNF 05
Requirement Name.	Save information
Features	The software needs to save information in files.
Requirement Description	The application is going to save information about inventory, users, appointments.
Priority requirement	High

3.3.1 Performance Requirements

The system will be able to save user data, inventory and medical appointments in files, therefore no information will be lost when running the application or when it is closed.

3.3.2 Reliability

The system will have an exhaustive validation, where in case the user makes mistakes the system will allow him to continue after giving a notification message to the user.

3.3.3 Availability

The availability will be around 800% because it requires many requirements, and its structure is very complex, so it must always be available to the user.

3.3.4 Maintainability

The preventive maintenance will be carried out every two weeks for a period of three months, the developers will carry out a check of the application, verifying the correct use of the exceptions, and the normal operation of the system, they will also add functionalities that help the system to function better and to be better manipulated by the user.

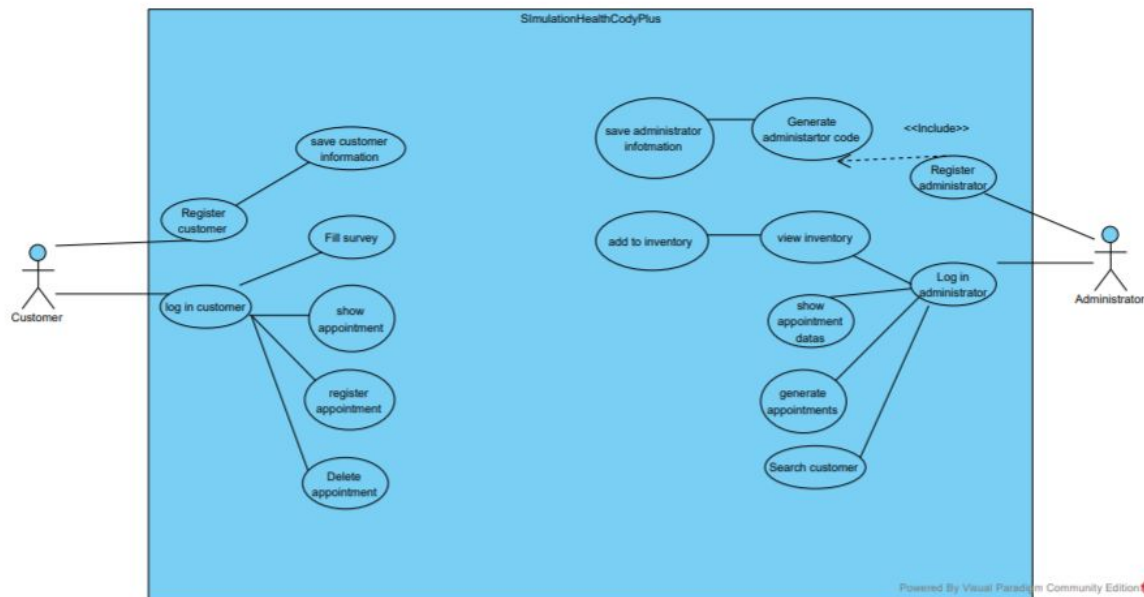
3.3.5 Portability

The application will be available for the operating system of Windows or with other operating system such as Linux, Mac that have the JRE (Java Runtime Environment) this has to be installed so that the developed software can work.

3.4 Other requirements

The changes that need to be done in the project are going to be in different versions understood in different classes.

4 Use case diagram.



5 Use case specification

5.1 Specification of use cases.

Identifier	Use Case 1
Name	Register administrator
Description	Register administrators.
Actors	Administrator
Preconditions	Nothing.
Postconditions	The system will save the administrators information.

Normal flow of events
The system can register an administrator in a json File.
Alternative flow of events
The system can not register an administrator and show an exception.

Identifier	Use Case 2
Name	Generate administrator code
Description	The system creates an administrator code.
Actors	Administrator
Preconditions	The administrator needs to be registered.
Postconditions	The administrator can access the code.

Normal flow of events
The system creates an administrator code.
Alternative flow of events
The system can not access it with a different code.

Identifier	Use Case 3
Name	Save administrator information
Description	Save all the data of the administrator.
Actors	Administrator.
Preconditions	The administrator needs to be registered.
Postconditions	The administrator's data appeared in a file.

Normal flow of events
The system saves the data of the administrator in a file.
Alternative flow of events
The system can't save the data because the administrator can't complete the data.

Identifier	Use Case 4
Name	Login administrator
Description	Login an administrator account.
Actors	Administrator
Preconditions	The administrator needs to be registered and have a code.
Postconditions	The system recovered the administrators data and comprobate this.

Normal flow of events
The system can access the administrator registers and comprobate the administrator.
Alternative flow of events
The system cannot comprobate anything because the file is empty

Identifier	Use Case 5
Name	View inventory
Description	The administrator can administer the inventory.
Actors	Administrator.
Preconditions	The administrator need access to the system.
Postconditions	The administrator can view inventory

Normal flow of events
The system can show the inventory for the administrator.
Alternative flow of events
The system cannot show inventory because the file is not created.

Identifier	Use Case 6
Name	Add to inventory
Description	The administrator can add things to the inventory.
Actors	Access to the inventory.
Preconditions	The administrator needs to be registered.
Postconditions	The administrator can

Normal flow of events
The inventory is created by the administrator.
Alternative flow of events
The inventory can't be registered for the file.

Identifier	Use Case 7
Name	Show appointments datas
Description	The administrator can view the appointments datas.
Actors	Administrator.
Preconditions	The administrator needs to be registered.
Postconditions	The administrator can view the appointments datas.

Normal flow of events
The administrator can view the appointments datas.
Alternative flow of events
The administrator can't view the appointments datas because don't exist the file.

Identifier	Use Case 8
Name	Generate appointments
Description	The administrator can create appointments for the week.
Actors	Administrator
Preconditions	The administrator needs to be registered.
Postconditions	The administrator can create appointments for the week for the customer

Normal flow of events
The administrator can create appointments for each week and it is saved in a file.
Alternative flow of events
The administrator cannot access because the file doesn't exist.

Identifier	Use Case 9
Name	Search customer
Description	The administrator can search a customer.
Actors	Administrator
Preconditions	The administrator needs to be registered.
Postconditions	The administrator can search a customer.

Normal flow of events
The administrator can search a customer.
Alternative flow of events
The administrator can't search a customer because the file doesn't exist.

Identifier	Use Case 10
Name	Register customer
Description	Register customers
Actors	Customer
Preconditions	Nothing
Postconditions	The system will save the customers information.

Normal flow of events
The system saves the customers information in a file.
Alternative flow of events
The system can not register a customer and show an exception.

Identifier	Use Case 11
Name	Save Customer Information
Description	The system saves the customer information in a json file.
Actors	Customer.
Preconditions	The customer needs to register an account..
Postconditions	The customer is saved in a file.

Normal flow of events
The system save the customer information in a json file.
Alternative flow of events
The system can't create a file with the customer.

Identifier	Use Case 12
Name	Login customer
Description	Login a customer account.
Actors	Customer
Preconditions	The customer needs a user and a password to access.
Postconditions	The system recovered the customers data and comprobe this.

Normal flow of events
The system can access the customer registers and comprobe the customer.
Alternative flow of events
The system cannot comprobe anything because the file is empty.

Identifier	Use Case 13
Name	Fill Survey
Description	The system shows a survey that needs to complete the customer.
Actors	Customer.
Preconditions	The customer needs to be registered and enter for the first time to the system.
Postconditions	The other occasions that the customer enter to the system, the survey don't appeared again.

Normal flow of events
The survey only appeared to be the first that the user accessed the system.
Alternative flow of events
The survey was not filled and the other occasion appeared again.

Identifier	Use Case 14
Name	Show appointment.
Description	The system shows the appointments disponibles to the customer.
Actors	Customer.
Preconditions	The customer needs to be registered.
Postconditions	The customer shows each one of the appointments that are disponibles in the system.

Normal flow of events
The system shows the appointments disponibles to the customer
Alternative flow of events
The system can't show anything because every date is ocupated.

delete appointment

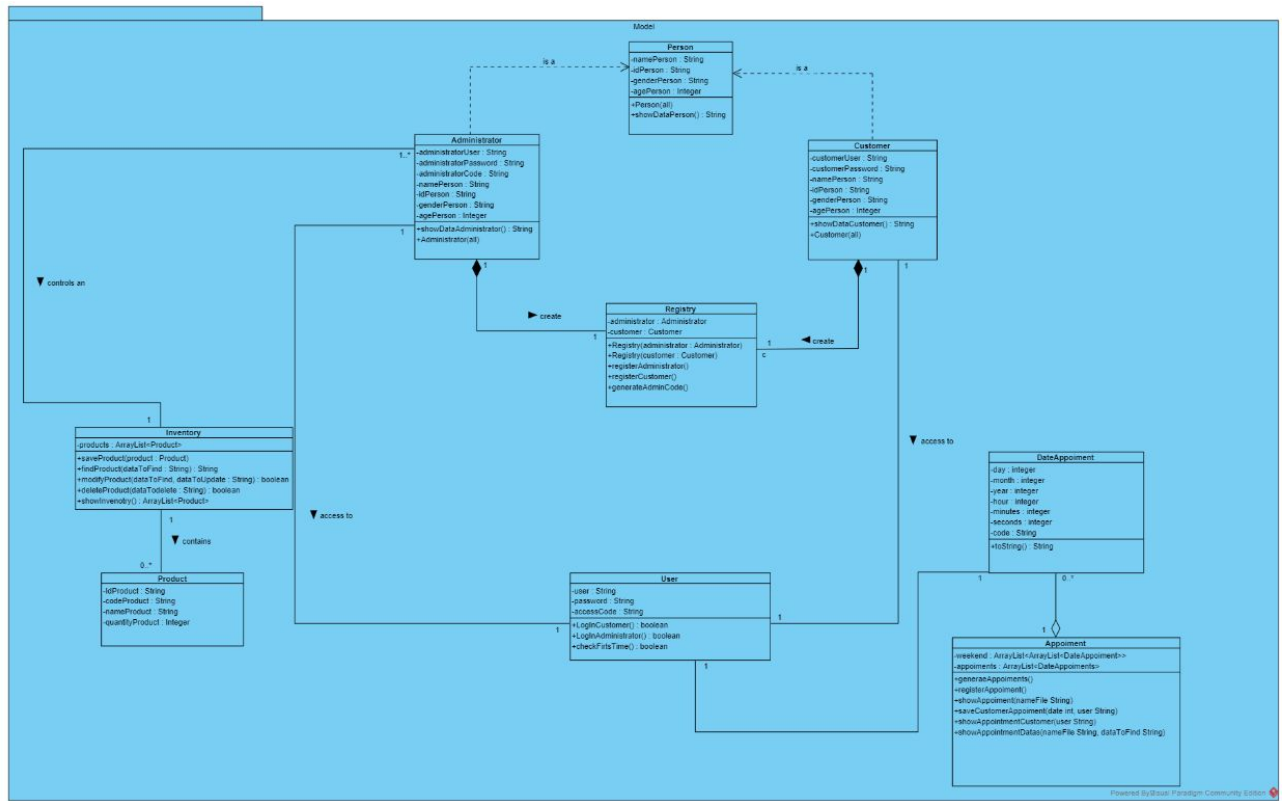
Identifier	Use Case 15
Name	Register appointment
Description	The system registers the appointment of the system.
Actors	Customer.
Preconditions	The customer only can save one date in the system.
Postconditions	The customer registers an appointment for the week.

Normal flow of events
The customer registers an appointment for the week.
Alternative flow of events
The customer can't register an account because the appointments are ocupated.

Identifier	Use Case 16
Name	Save appointments
Description	Delete appointment
Actors	Customer
Preconditions	The customer can delete appointments.
Postconditions	The customer can save another appointment because save the last appointment.

Normal flow of events
The customer can delete the appointment.
Alternative flow of events
The customer can't delete the appointment because don't have appointments done.

6 Class diagram



7 Class diagram specification

The diagram is based in the model system package that creates the operations that are going to do our project.

7.1 Specifying class attributes

1) Person

1.1) Attributes:

- namePerson: String
- idPerson: String
- genderPerson: String
- agePerson: Integer

1.2) Methods

- Person(all)
- showDataPerson():String

2) Administrator

2.1) Attributes:

- administratorUser: String
- administratorPassword: String
- administratorCode: String
- namePerson: String
- idPerson: String
- genderPerson: String
- agePerson: Integer

2.2) Methods

- showDataAdministrator():String
- Administrator(all)

3) Customer

3.1) Attributes:

- customerUser: String
- customerPassword: String
- namePerson: String
- idPerson: String
- genderPerson: String
- agePerson: Integer

3.2) Methods

- showDataCustomer():String
- Customer(all)

4) Registry

4.1) Attributes:

- administrator: Administrator
- customer: Customer

4.2) Methods

- Registry(administrator: Administrator)
- Registry(customer: Customer)
- registerAdministrator()
- registerCustomer()
- generateAdminCode()

5) User

5.1) Attributes:

- user: String
- password: String
- accessCode: String

5.2) Methods

- loginCustomer():boolean
- loginAdministrator():boolean
- checkFirstTime():boolean

6) DateAppointment

6.1) Attributes:

- day: Integer
- month: Integer
- year: Integer
- hour: Integer
- minutes: Integer
- seconds: Integer
- code: Integer

6.2) Methods

- toString():String

7) Appointment

7.1) Attributes:

- weekend: ArrayList<ArrayList<DataAppointment>>
- appointments: ArrayList<Appointments>

7.2) Methods

- generateAppointments()
- registerAppointments()
- showAppointment(nameFile String)
- saveCustomerAppointment(date int,user String)
- showAppointmentCustomer(user String)
- showAppointment Dates(nameFile String,dataToString String)

8) Inventory

8.1) Attributes:

- products: ArrayList<Product>

8.2) Methods

- saveProduct(product: Product)
- findProduct(dataToFind: String): String
- modifyProduct(dataToFind: String,dataToUpdate: String):boolean
- deleteProduct(dataToDelete: String): boolean
- showInventory():ArrayList<Product>

9) Product

7.1) Attributes:

- idProduct: String
- codeProduct: String
- nameProduct: String
- quantityProduct: Integer

8 User interfaces

8.1 Software Interfaces

MAIN MENU

```
MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion:
```

MENU FOR REGISTER AN ACCOUNT


```
run:
MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 2
1. Administrador
2. Usuario
Seleccione una opcion: |
```

SELECT ADMINISTRATOR

```
MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 2
1. Administrador
2. Usuario
Seleccione una opcion: 1
Complete los datos
Nombre: Juan
id: 1714889875
Genero: male
Edad: 25
Ingrese un usuario: juan@l45.hotmail.com
Ingrese una contraseña: juan1225487_cordova
Su codigo de acceso es: 1714889875Juan
```

SELECT CUSTOMER

```

MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 2
1. Administrador
2. Usuario
Seleccione una opcion: 2
Complete los datos
Nombre: Juan
id: 174858
Genero: male
Edad: 15
Ingrese un usuario: juanCordov
Ingrese una contraseña: juanitol23

```

MENU FOR THE LOGIN

```

MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 1
1. Administrador
2. Usuario
Seleccione una opcion:

```

MENU FOR THE LOGIN ADMINISTRATOR

```

MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 1
1. Administrador
2. Usuario
Seleccione una opcion: 1
Usuario: juan@145.hotmail.com
Contraseña: juan1225487_cordova
Codigo de acceso: 1714889875Juan
Correcto

```

MENU FOR THE LOGIN CUSTOMER

```
MENU
1. Iniciar seccion
2. Registrarse
3. Salir
Seleccione una opcion: 1
1. Administrador
2. Usuario
Seleccione una opcion: 2
Usuario: juanCordov
Contraseña: juanitol23
Correcto
```

8.2 Hardware Interfaces



The hardware interface is the most important tool for a programmer. The code is created from the display and the keyboard.

9 Appendices

The project and the documentation was done by software engineering students.

As the project is in constant evolution, the documentation is going to change for every part of the project.