Info 3

Laboratory 3

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Lab 3: Scenarios, Use Cases, and Use Case Diagrams

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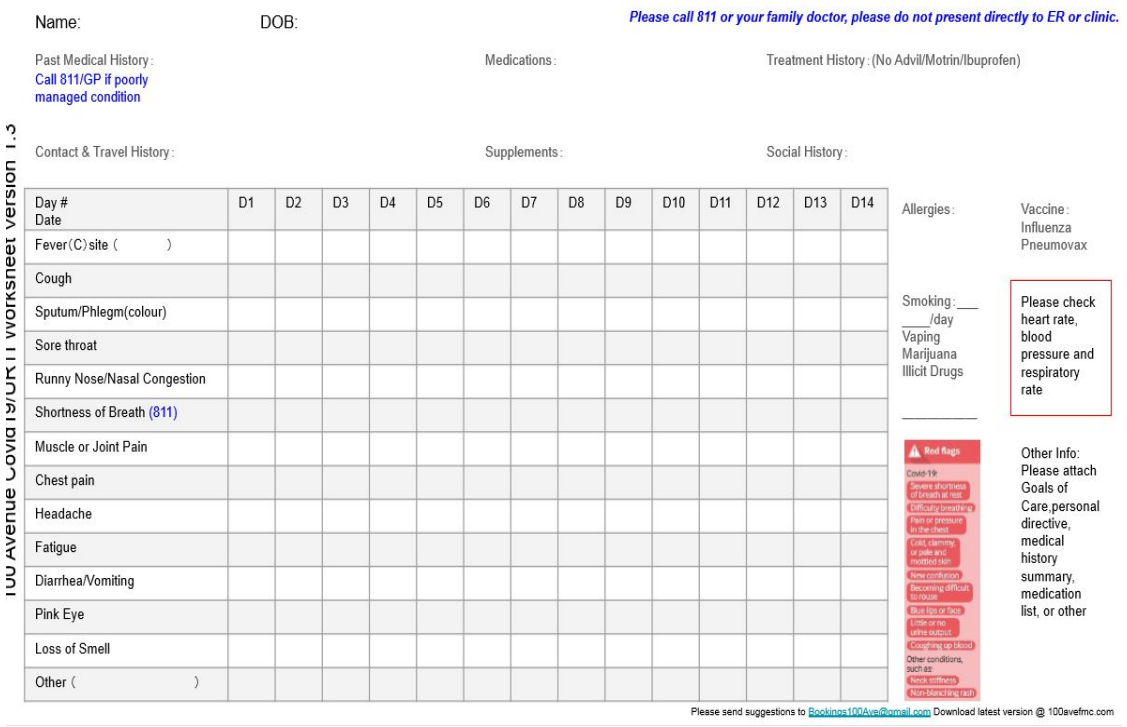
App: Symptom Tracker

Users can download the Symptom Tracker app on their phone in order to track symptoms on a day-to-day basis. When the app is opened for the first time users can choose to input symptoms that they've had from before or to input symptoms they started experiencing from today. After inputting symptoms, a database is then created locally on the user's phone. Our app will be using an algorithm that tracks and evaluates the data, which the users input daily, and inform them with a notification if certain thresholds are reached.

Users will be able to create a PDF-file, which contains data about their symptoms and share it if they choose to. Users are free to choose whether they want to share their symptoms data with us, so we can gather it in our own database, where we can track what symptoms users report the most and evaluate symptom development.

Here is an example of what the PDF document could look like.



100 Avenue Covid19/UR 11 Worksheet version 1.3

Name: DOB:

Please call 811 or your family doctor, please do not present directly to ER or clinic.

Past Medical History:
Call 811/GP if poorly managed condition

Medications:

Treatment History: (No Advil/Motrin/Ibuprofen)

Contact & Travel History:

Supplements:

Social History:

Day # Date	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14
Fever(C) site ( )														
Cough														
Sputum/Phlegm(colour)														
Sore throat														
Runny Nose/Nasal Congestion														
Shortness of Breath (811)														
Muscle or Joint Pain														
Chest pain														
Headache														
Fatigue														
Diarrhea/Vomiting														
Pink Eye														
Loss of Smell														
Other ( )														

Allergies:

Vaccine:
Influenza
Pneumovax

Smoking: ___ ____/day
Vaping
Marijuana
Illicit Drugs

Please check heart rate, blood pressure and respiratory rate

Red flags
Covid-19:
Severe shortness of breath at rest
Difficulty breathing
Pain or pressure in the chest
Cold, clammy, or pale and mottled skin
New confusion
Becoming difficult to rouse
Blue lips or face
Little or no urine output
Coughing up blood
Other conditions, such as:
Neck stiffness
Non-blanching rash

Other Info:
Please attach Goals of Care,personal directive, medical history summary, medication list, or other

Please send suggestions to Rockings100Ave@gmail.com Download latest version @ 100avefmc.com

Source: http://www.100avefmc.com/ http://www.100avefmc.com/images/doc/record.pdf

Users will be able to change the language of the app and choose between multiple languages.

If at any point a user decides to uninstall the Symptom Tracker from their phone, we need to ensure that, in case they have shared any symptoms data with us, it is also deleted from our own company's database.

1. **Your first job is to identify the actors in such an application system. Give them names and a one sentence description of their jobs.**

Actors:

1. Users - They input their symptoms in the app on their phone
2. Database - Includes a list of symptoms and takes the data that the user inputs and saves it locally on the user's phone.
3. App - The algorithm in the app tracks and evaluates the given symptoms and marks the profile if needed (shows a message/notification about potential risk).
4. Our Company - has a database in the HQ where we can gather and work with the data of our users if they choose to share it with us.

2. **Now each member of the team develops at least three concrete scenarios. That means at least 9 scenarios for a 3-person-group, at least 12 for a four-person group.**

Scenarios

1. As a User, I want to put in my symptoms because I want to have a better overview over my healthstate. - One of our users experiences some kind of bad symptoms so he wants to put them into the app by choosing the symptoms today button he can click on the symptom(s) that he is experiencing.

Name	**Symptoms input**
Precondition	The user has an existing database locally on his device
Sequence of steps	1. The user opens the app 2. User selects "Input symptoms" 3. User inputs all the symptoms he/she is experiencing and clicks on "Save" 4. The symptoms data is saved in the already existing database on the user's device
Postcondition	User has inputted symptoms and the database has been updated with the new input

2. As a User, I want to login because I want to put in some symptoms that I have experienced for some time now. - After downloading our app our user can choose to put in his previous symptoms if he had some.

Name	**First startup**
Precondition	User has downloaded the app and has not opened it yet
Sequence of steps	1. User opens the app 2. A message about inputting any pre-existing symptoms is shown 3. The user can choose to add them later or now 4. If (the user chose to input pre-existing symptoms) user has to specify on what date and which symptoms he/she had 5. Else (add later button is pressed) and user can input symptoms for today 6. The user inputs the symptoms he/she is experiencing and clicks “Save” 7. A new database, holding all the reported symptoms from the user is created locally on the device
Postcondition	A new database is created locally on the device, it holds all the reported symptoms and the user can see an overview

3. As a App, I want to create a database because I want to save the data. - After installing the app the user chooses to put in previous symptoms. If he clicks yes the app generates a database with the data our user gave us already in it but if he did not had any symptoms so far, we create an empty database.

Name	**Viewing the list of symptoms**
Precondition	User has downloaded the app.
Sequence of steps	1. User opens the app 2. User adds new symptoms. 3. User clicks “save” button. 4. User now sees the list of symptoms he saved.
Postcondition	Database is created. Symptoms are added to database.

4. As a algorithm, I want to analyze new data because my conclusion will be more accurate. - If our user has one or more symptoms and puts these into our app then our evaluating algorithm has to start since there are new information that are important to the evaluation of the profile.

Name	**Analyzing data**
Precondition	The user has been inputting new symptoms everyday for at least three days, but they did not reach a certain threshold.
Sequence of steps	1. User opens the app 2. User adds new symptoms. 3. The user clicks to save the new symptoms in the database. 4. Algorithm that runs every time after changes in database have been made, evaluate and analyze new data. 5. Since a certain threshold about the symptoms has NOT been reached algorithm stops working till the next changes in database.
Postcondition	New symptoms are saved and the app has evaluated them, threshold is not reached and the algorithm stops working. User receives no notifications.

5. As a App, I want to flag/deflag a profile because I want to prompt a warning message if the symptoms are suspicious - When a user puts in to many symptoms in a short period of time or a certain combination of symptoms that could match a specific disease the profile gets flagged and he gets a warning message that he should visit a doctor. If he stops putting in symptoms and does so for a while the profile gets deflagged.

Name	**Showing a warning message**
Precondition	User has reported symptoms for a period of time
Sequence of steps	1. User opens the app 2. User inputs symptoms 3. The database is updated with the newly inputted symptoms 4. If (a certain threshold about the symptoms has been reached) then a notification that warns the user is shown 5. Else the app keeps on tracking and evaluating the user's reported symptoms
Postcondition	The user is either shown a notification with a warning message or no message is shown

6. As a user i want to be able to request a pdf file, because i want to see a list with all the symptoms reported and potentially be able to share it. - Requesting a pdf file with recorded symptoms in a profile - A user has the opportunity to create a pdf-document of his records by clicking the create pdf button. That shows him a calendar like form with his symptoms and when he put them in.

Name	**Request a PDF file with list of symptoms**
Precondition	The user already has some reported symptoms and he is currently in the main menu
Sequence of steps	1. The user presses on the “Share” button 2. Screen appears where he gets a message like:”The more info you share with us the more precise or deductions will be.” 3. The user clicks on “understood” 4. A new window appears where he can choose between share options 5. The user clicks on “Create PDF” 6. The algorithm is building a PDF on the device of the user 7. When the algorithm is done building the user is getting back to the main menu
Postcondition	A PDF is created on the device of the user

7. As a user, I want to see my statistics because I want to see how my symptoms are developing on daily basis - The user can see his symptoms and when he put them in by clicking the statistics button. He then gets presented with a calendar like table that shows all the symptoms in the database.

Name	**Symptom Statistics**
Precondition	A user has filled his database & he is at the main menu
Sequence of steps	1. The user clicks on the “Statistics” button 2. The algorithm analyses the database and searches for the newest disease 3. A list appears where the user can review his symptoms he developed for every day since his first entry for the current disease
Postcondition	The user is shown a statistic of his reported symptoms and how they have developed since the first symptom entry

8. As a user, I want to share my information with the company because I want to help them gather more information. - The share button gives the user the option to share his data with our company so that we can work them. We cannot force the user to give us the data nor can we access the data ourselves without him choosing to share them.

Name	**Data for the developer**
Precondition	A user has filled his database & he is at the main menu
Sequence of steps	1. The user presses on the “Share” button 2. Screen appears where he gets a message like:”The more info you share with us the more precise our deductions will be.” 3. The user clicks on “understood” 4. A new window appears where he can choose between share options 5. The user clicks on “Share with Developer” 6. A new window appears where the user can choose his data he wants to share 7. The user is done and clicks on “Done Choosing” 8. A new window appears that requests from the user if he is okay with that 9. The user presses “Yes” 10. If the user has an internet connection the data gets send to the special database from the developers 11. A screen appears with the message “Thank you for your Support” 12. The user presses on a button called “No Problem” 13. He is getting back to the main menu
Postcondition	The user agrees to share and has shared his data with the developers

9. As a user, I want to uninstall the app because I do not need the service anymore. - We ensure our users that if they want to uninstall the app we will delete all the data of them if they chose to share them with us beforehand.

Name	**Deleting the App**
Precondition	User installed the App. User added symptoms. User shared symptoms with developer Company. User decided to delete the App.
Sequence of steps	1. User deletes the App from the device. 2. We receive information about the deletion. 3. We delete user's information from database.
Postcondition	Application is deleted from user's device. User's data are deleted from database.

10. As a user, I want to change the language because I moved from my country/I do not understand a symptom in that language, etc.

Name	**Changing language**
Precondition	App is installed. Initially "English" language is set up for the App. User wants to change language to "German".
Sequence of steps	1. User opens the App. 2. User clicks the button "language". 3. User sees a list of available languages. 4. User selects "German" in the list. 5. User sees a notification that changes will be applied after he close up and open it again. 6. User closes the App. 7. User opens the App.
Postcondition	The language of the application changed. Now all menus and description as well as the name of the symptoms are in german language.

11. As a user, I want to edit/delete some of my input symptoms because I miss clicked or did not know what I had at the beginning.

Name	**Delete symptom**
Precondition	User installed the app. User added wrong symptom. User opens the page with this symptoms.
Sequence of steps	1. User clicks “edit/delete” button near the wrong symptom. 2. Symptom is removed from the list of symptoms.
Postcondition	Symptom is deleted from the database. Statistic of symptoms is renewed.

12. As an algorithm, I want to use a timestamp in order to evaluate the profile more precise. - The system sets a timestamp for each symptom that the user puts in so that the algorithm can work with it.

Name	**Timestamp for each symptom**
Precondition	User installed the App. The app is opened.
Sequence of steps	1. User inputs symptoms that he is experiencing 2. User saves the inputted symptoms 3. The system automatically sets a timestamp for each reported symptom.
Postcondition	Every symptom that the user added has a timestamp and the algorithm is now able to process symptoms efficiently.

3. From the scenarios now develop the use cases. Which actors are involved with which use case? Give the use cases names and describe them using the format above.

Name	Login for the first time (First Startup)
Actors	User, App, Database
Summary	When opening the app for the first time, users are able to input pre-existing symptoms if they choose to, input symptoms experienced today, or skip both and proceed to the main menu
Precondition	User has downloaded and opened the app
Sequence of steps	1. John opens the app 2. Screen appears where he gets a message like:"The more info you share with us the more precise or deductions will be." 3. John clicks on "understood" 4. Message appears that asks him if he had previous symptoms and if he is willing to share them with the database on his phone. 5. If he selects "Add later" the main menu opens 5.1. John can choose to either input his symptoms or look at his own statistics respectively symptoms calendar. He can also create a pdf file of his data. 6. Else he can select "Add now" and he can add his symptoms and on which date he had them. 7. The app creates a database on John's device in the background and puts his information in there. He then gets to the main menu.
Trigger	The user wants to use the service of our app.
Postcondition	John is in the main menu and has either an empty database or a database filled with the informations he gave us.

Name	Symptoms input cycle
Actors	User, App, Database
Description	Using the “Symptoms Today” button John shares his data with the app
Precondition	John has downloaded the app. He has logged in once and got to the main menu.
Sequence of steps	1. John is on the main menu 2. He selects the “Symptoms Today” button 3. The app accesses the database and a screen with all the symptoms is shown 4. He can choose the symptoms that he is experiencing 5. After he clicked on all the symptoms the main menu shows up again, the database is updated 5.1. The app accesses the time on his phone and gives his input a timestamp 5.2. The algorithm starts and evaluates the new data 5.3. If the new data pushes his profile over a certain boundary his account gets flagged/highlighted 6. Johns statistics get updated as well
Trigger	The user wants to put in his symptoms.
Postcondition	Database is updated and depending on the flagging state of his profile he could get a warning message.

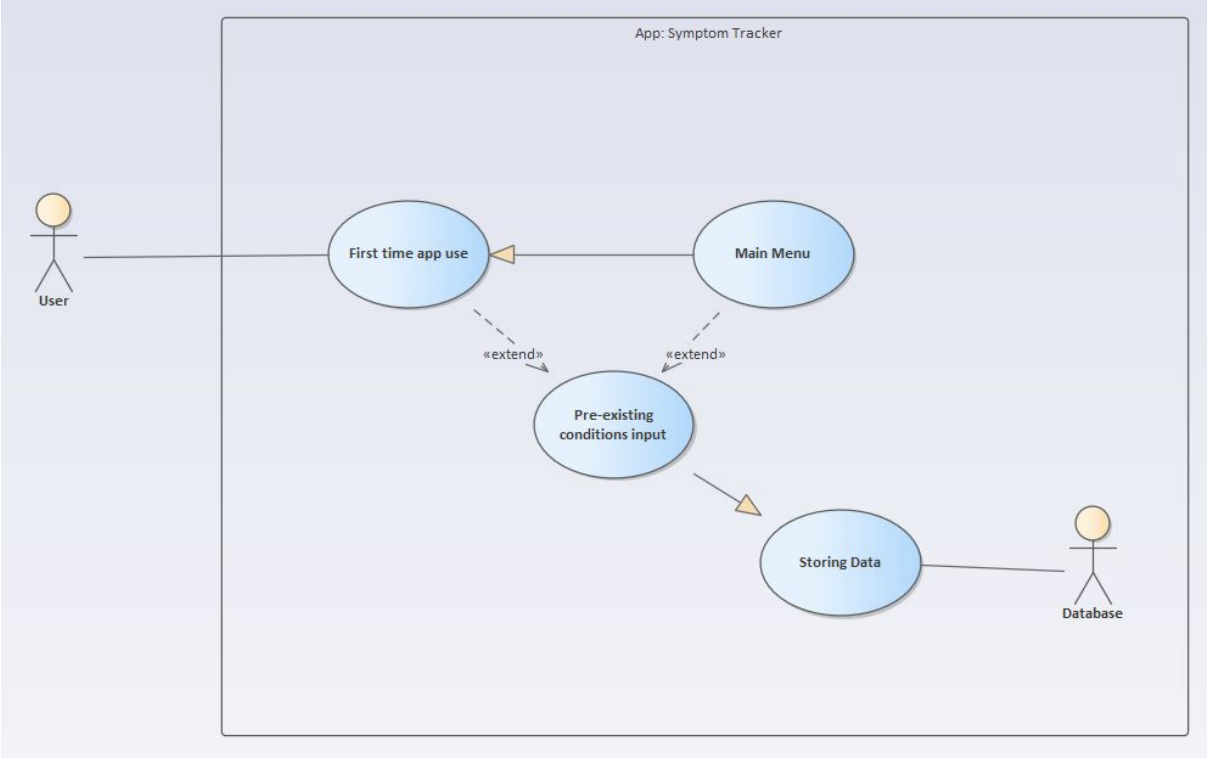
Name	Create a Symptoms-PDF
Actors	User, App
Description	John is creating and filling out a pdf-form with his so far shared data
Precondition	John has downloaded the app. He has logged in once and got to the main menu.
Sequence of steps	1. John clicks on the “CREATE PDF” button 2. He gets presented with a confirmation screen where he can look at the blueprint of the pdf-document 3. He can choose between clicking on a “CONTINUE”-button or a “CANCEL”-button 3.1. “CANCEL” brings him back to the main menu while stopping the createPdf() method 4. The “CONTINUE”-button then takes the form with his data filled in and creates a pdf-document on his phone
Trigger	The user wants to create a PDF, to potentially see a complete list of the symptoms with their timestamps or show it to someone else.
Postcondition	The user is in possession of a PDF-document with all his symptoms being listed in our pre designed form.

Name	Share symptoms data
Actors	User, App, Company
Description	The user has decided to share their symptoms data with us so we can collect it in our own company database
Precondition	The user has gone through the “login for the first time”-steps and is currently in the main menu
Sequence of steps	1. John clicks on the “Share data” button 2. A screen with a notification about data privacy appears 3. John is presented 2 options, either “AGREE” to share his data with us and continue on or “CANCEL” 3.1. If “CANCEL” is clicked, the process is terminated and the user is sent back to the main menu 4. After clicking on “AGREE”, the App automatically creates a PDF file with the user’s symptoms data and the file is shared with us
Trigger	User shares his data with our company.
Postcondition	The user has agreed to the data privacy terms, a pdf with his symptoms data is created and then shared with us (administrator database)

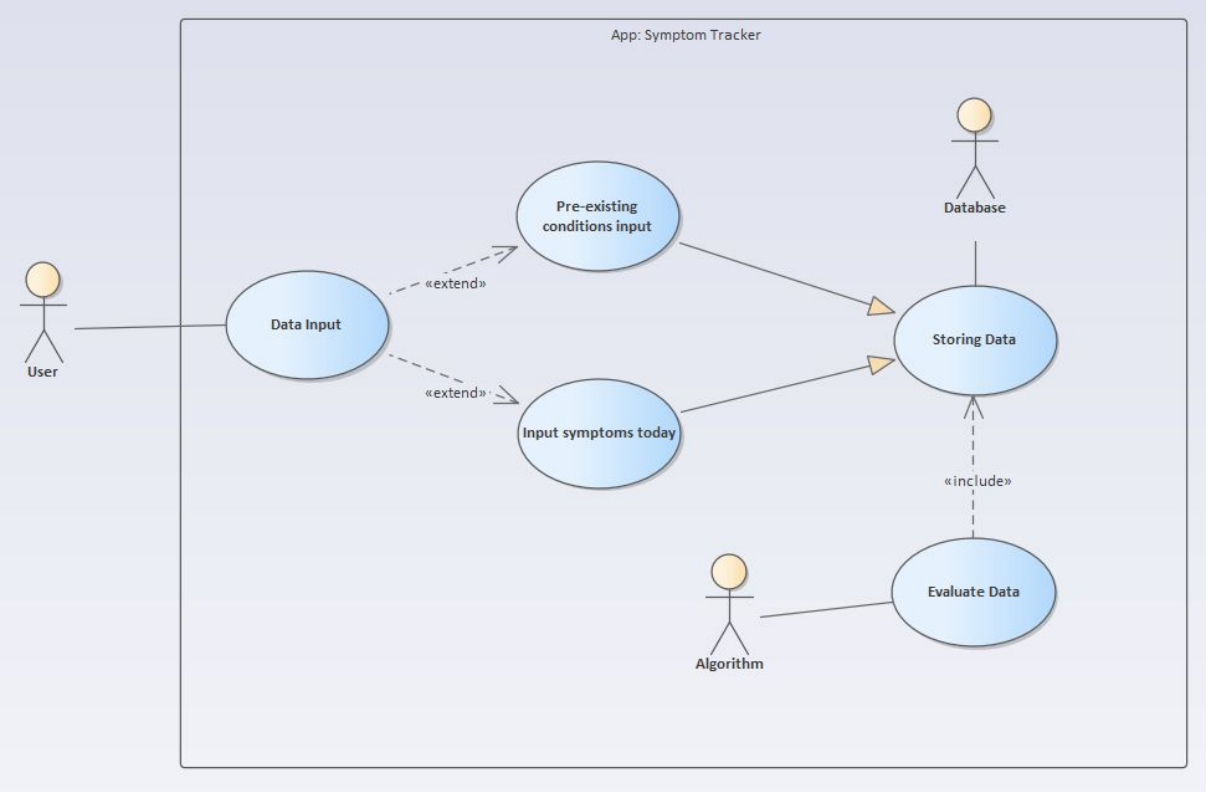
4. **Draw appropriate use case diagrams using Enterprise Architect or another tool to show how your actors communicate in the use cases. Try to generalize from some concrete situations, what is the common part? Can you perhaps even define an inheritance hierarchy, that is, there is a general, a sort of "super" use case that has specialist use cases? Fix the use case diagram to reflect this! We use arrows between the use case ovals to denote this. Look up the syntax on the web and include the URL of where you found it in your report.**

For creating the Use Case diagrams we used Enterprise Architect. Since we only had vague ideas about dealing with Use Case diagrams, we searched for some information on the web. Fortunately we found the documentation from the developers of Enterprise Architect: https://www.sparxsystems.eu/resources/project-development-with-uml-and-ea/use-case-diagram/
We read through the webpage and the examples given and we were able to create the Use Case Diagrams.

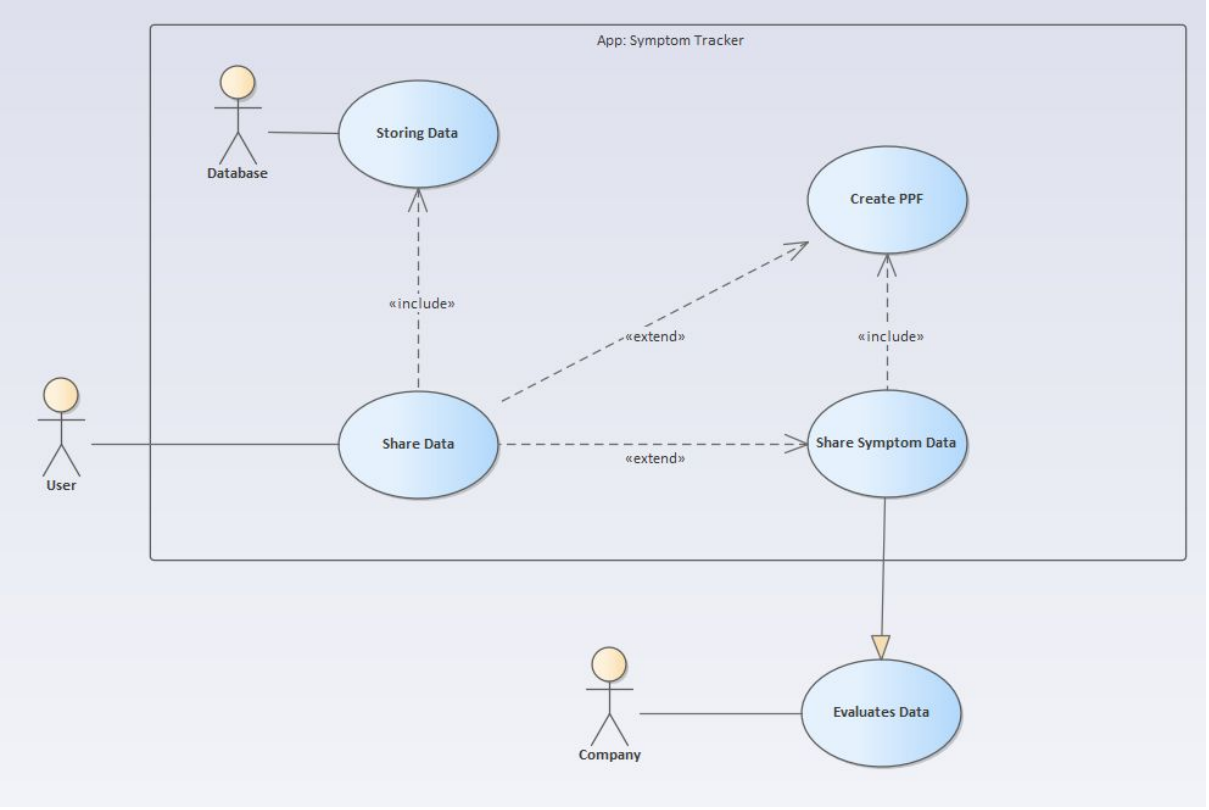
1. Login for the first time:



2. Symptoms input cycle:



3. Share Data



Reflection:

Pavel: This exercise was interesting, but also challenging. However, it made me think about things I didn't pay attention to before and I now understand how to identify actors and develop scenarios, which can be very useful. Writing the sequence of steps helped me and the other group members see what we were missing or didn't even think about. It was also great to think what exactly is the precondition and the postcondition in a scenario, because we could see from where we start and what happened after we went through the steps. Working together on the Use Case Diagrams was also interesting, I learned about the "extends" and "includes" arrows and when they should be used.

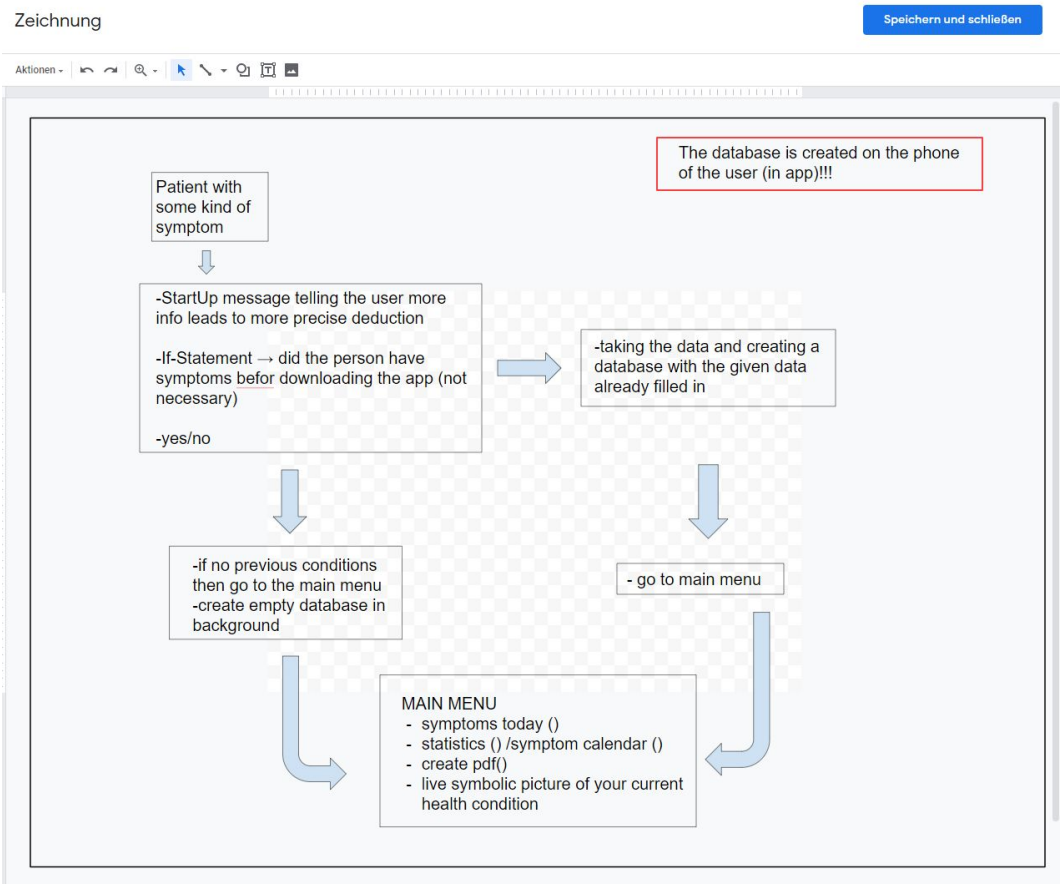
Niklas: So this was more challenging than I thought to be honest. The whole process of planning a certain application and thinking it through to the end had a lot more nuances than I expected it to have. I guess if I had to sum up what I learned from this project than it is that you can never see all the problems that come up during a project at the beginning. Outside of the exercise sessions we worked twice on this for approximately 5 hours each time. That sums up to about 13 hours of work.

Robin: At the beginning of this Lab we were strongly working together on the first scenarios and use cases that our ideas of this app are fitting together. It was a slow start but once we all had a good idea about how this app should look like we were able to communicate less. Through that it became bigger quite fast. It is quite difficult to keep track about what the others are doing and if it fits with the own idea. While working we had to think about several problems that made us change some of our ideas. I am still not quite sure about the Use Case diagrams and if it fits the things i was reading on the web. The difficulty with this task came with the possibilities this Lab provides.

Nataliia:
Unfortunately, I was able to participate in the process only at the beginning and missed a couple of meetings because of some health problems (Krankmeldung is available). And I am very grateful to other members of the group who did this lab. Guys invested significant amount of time in work with use cases. It was really challenging and showed us how hard it is to build a proper architecture for application. But I hope that we did the biggest part of work. And since we spent so much time, further parts like UML diagrams should be a bit easier.

Brainstorm Sheet:

This was something we created to see what we wanted to do exactly, because we didn't really understand the whole concept behind our idea at first.



Symptoms today) →after inputting symptoms, we can see the database with a list of symptoms where the user can check the symptom that they are currently experiencing

Symptoms today() → starts the algorithm which tracks and evaluates when a certain threshold is reached, depending on the time and symptom he/she has/is experienced/experiencing and that triggers a message (
different flag stages → first stage = be cautious
second stage = You should visit a doctor!)

statistics()/symptom calendar() → opens file (looking like a calendar) with all the data that you have put into the app

create pdf() → creates a pdf file of the symptoms calendar
click on heart() → shows you an evaluation of your health data, gives you information about the symptoms that you have experienced for the longest time (**that was just an idea we had**)