SE-2 COURSE PROJECT (PHASE 2 COVER SHEET)

Discussions Scheduled for Week 12 *(Specific dates TBA by the TAs).*

- Print 1 copy of this cover sheet and attach it to a printed copy of the documentation *(SRS, … etc.)*. You must submit softcopies of all your documents *(as PDFs)*; details will be announced later.
- Please write all your names in Arabic.
- Please make sure that your students' IDs are correct.
- Handwritten Signatures for the attendance of all team members should be filled in before the discussion.
- Please attend the discussion on time *(announced separately)*, late teams will lose 3 grades.

Project Name: Automated Insulin Pump

Team Information *(typed not handwritten, except for the attendance signature)*:

	ID [Ordered by ID]	Full Name [In Arabic]	Attendance [Handwritten Signature]	Final Grade
1	20208197	محمد سعيد وزيري		
2	20208200	محمد عبدالحي محمد محمد		
3	20208204	محمد فؤاد شعبان		
4	20208271	هاجر احمد عبدالقادر		
5	20208283	هبه سيد مقبول سيد		
6	20208292	يارا ممدوح رشدي		

Grading Criteria:

Items		Grade	Notes
Functional Requirements & Non-Functional Requirements – *including any updates, and all timing constraints.*	1		
Bonus: System Architecture – *including any applied Architectural Pattern(s).*	1		
Use-Case Diagram(s) – *including all use-cases for the system, and the detailed use-cases description, and any alternative scenarios.*	1		
Sequence Diagram(s) – *including varying fragments, interaction references/gates, different types of messages & constraints, .. etc.*	2		

Collaboration/Communication Diagram(s) – *including different types of messages, and the objects must have stereotypes indicating their categories based on the given class/object structuring criteria.*	**1**		
State-Machine Diagrams – *for all state dependent objects, and for the entire system too, including "when necessary" Events/Actions, Guards, Entry and Exit events/actions, Composite and Orthogonal states, Submachines, History States.. etc.*	**2**		
Bonus: Object Diagrams – *including object diagrams that illustrate the preconditions and the post-conditions of selected functions.*	**1**		
Bonus: 2 Design Patterns Applied – *Including a typed description of the pattern and how is it applied.*	**1**		
Detailed Class diagram – *including "when necessary" Classes, Attributes & Methods, Interfaces & Abstract Classes, Associations / Aggregations / Generalizations / Association Classes / Qualified Associations, Constraints - including also the categories of the classes based on the given class/object structuring criteria, and stereotypes indicating the type/category of each class. All necessary types/categories should be modelled.*	**2**		
Stimuli/Response Identification (State Transition Table)	**1**		
Implementation & discussion. Marking the code will be based on the following criteria: **1) Requirements are fulfilled.** **2) Correctly mapping design models into executable code.** **3) Running correctly.** **4) Detailed Testing.** **5) Correct multithreading implementation and synchronization.**	**5**		

N.B. I .. **<u>You must update and resubmit the initial part of the documentation submitted in phase 1</u>** (including the Functional / Non-Functional requirements, Use-case Diagrams & Descriptions, Activity Diagrams, Interaction Diagrams, Object Diagrams, .. etc.).

Teaching-Assistant's Signature: _____

_____
15

-FUNCTIONAL REQUIREMENTS:

1-Firstly, nurse need to login to be able manage system.

2-The amount of insulin to be delivered shall be computed according to the current sugar reading as measured by the sensor

3-System compute dose by measuring the current level of blood sugar,

4- System Compare curren blood sugur with previously measured level, and computing the required dose.

5- The system shall maintain three displays

- 6Display 2- shows the last dose of insulin that was computed

7- Clock - displays the current clock time.

8- System Display 1- a text display that shows system messages.

9- System allows nurse to see all the registered patients with their details data

4.Other Non-functional Requirements:

4.1 Performance Requirements:

o The controller shall run a self-test program every 30 seconds.

• The system shall measure the level of blood sugar and deliver insulin if required every 10 minutes.

o The design of the reservoir compartment is such that only full reservoirs holding 100 ml of insulin may be inserted. When a new insulin reservoir has been inserted, the system is reset.

•When switched on, the system is initialized.

4.2 Usability & Humanity REQS:

The nurse may replace the insulin reservoir with a new reservoir at any time

4.3 Security & Safety Requirements

- The system is password protected and also any update of new patient and order processing is done by only (nurse).

4.4 Software Quality Attributes:

-Portability: The application will be easily portable on any window based system.

-It is easy, available, secured Website.

- Ease to maintain both System & Database

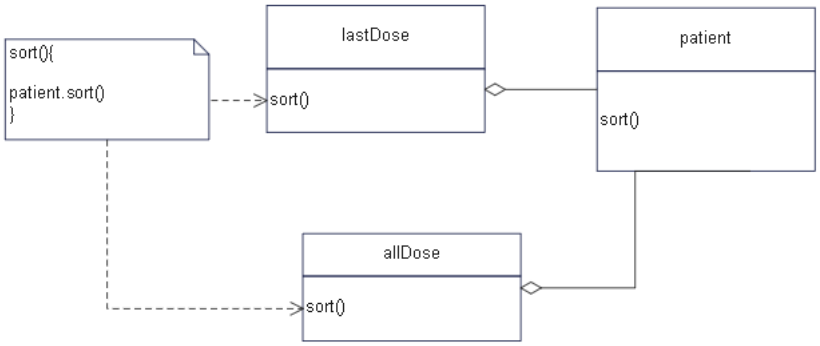
4.5 Business Rules

-Only the nurse can add or view patient data(all doses, last dose,) in the firebase.

Design Patterns:

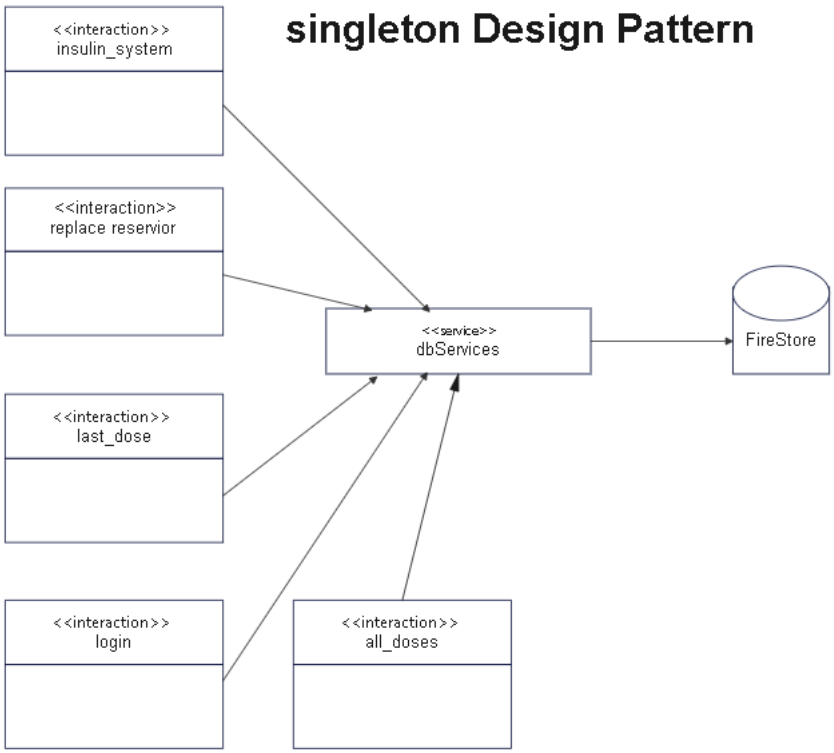
delegationDesignPattern

Delegation Design Pattern

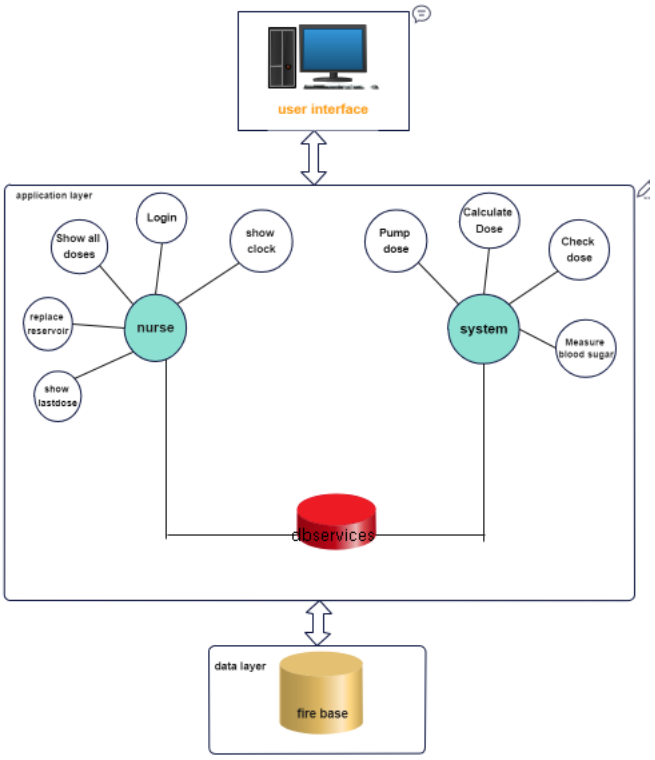


singletonDesignPattern

singleton Design Pattern



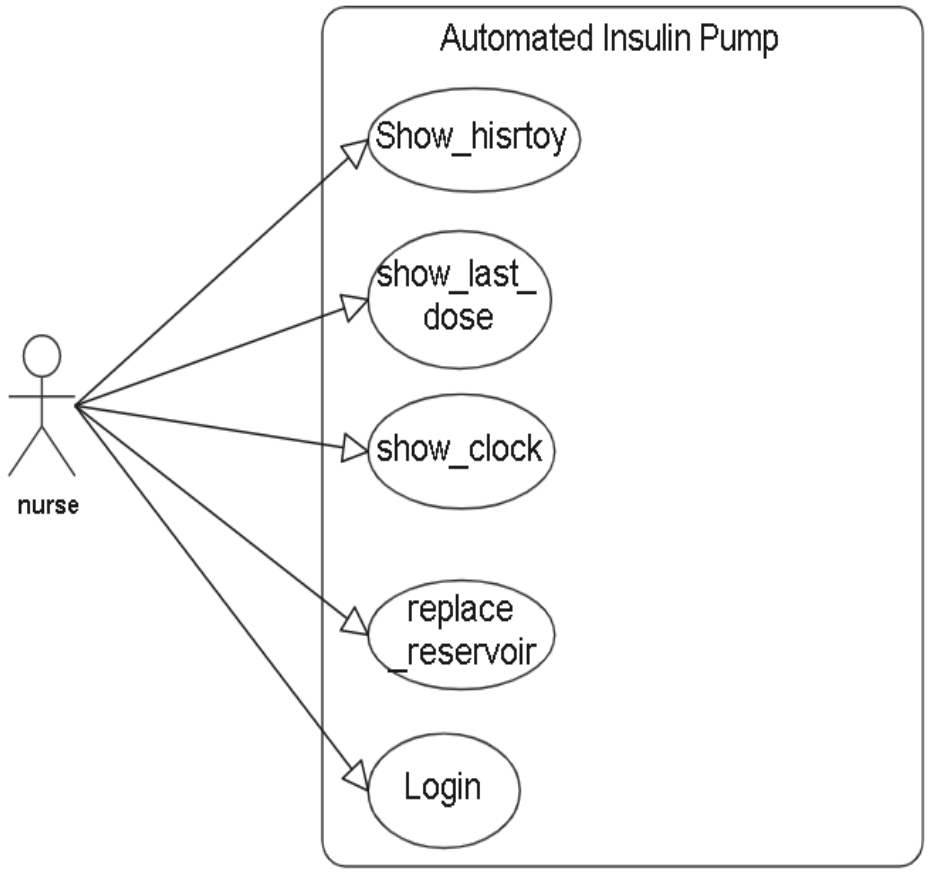
System Architecture:



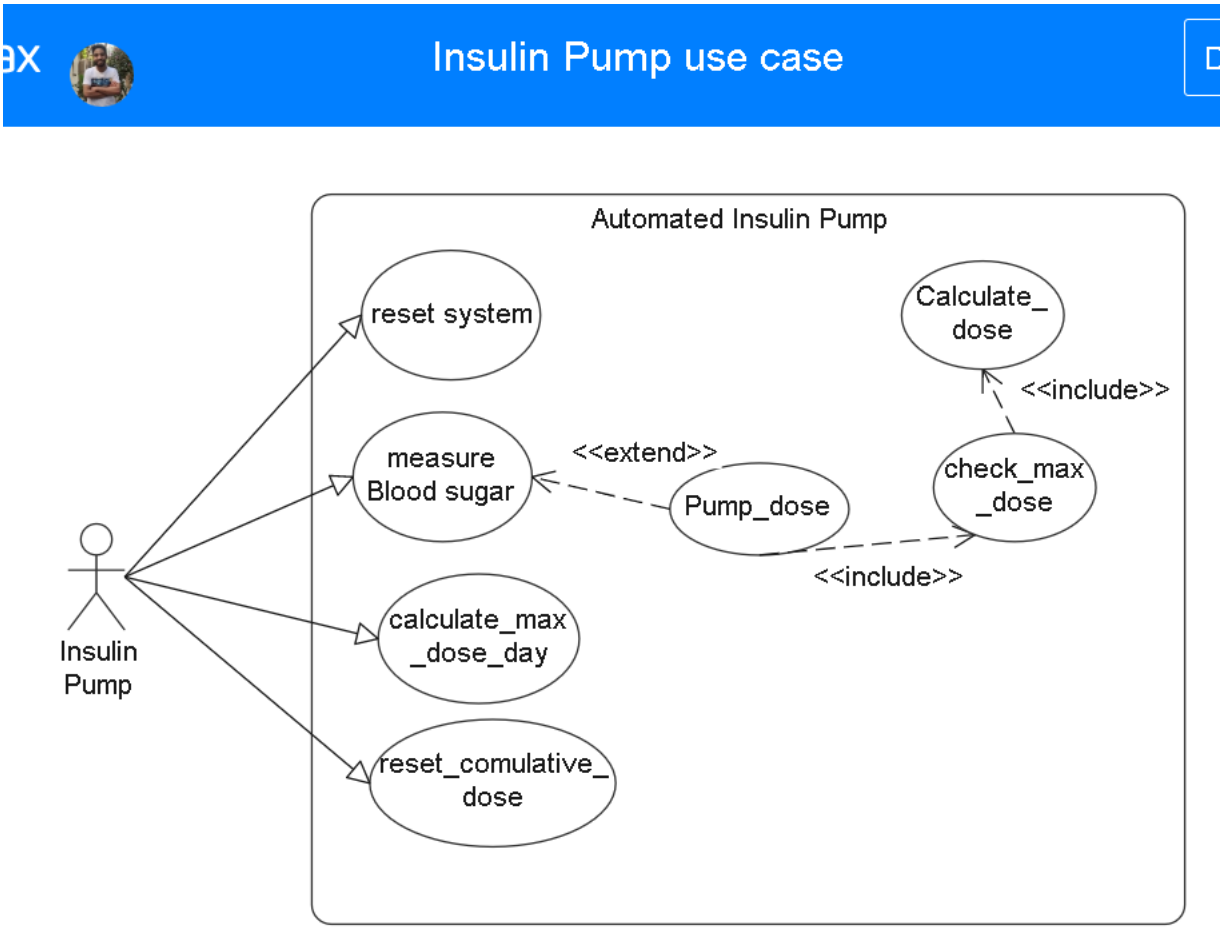
Use Case Diagram:

Nurse Use Case:

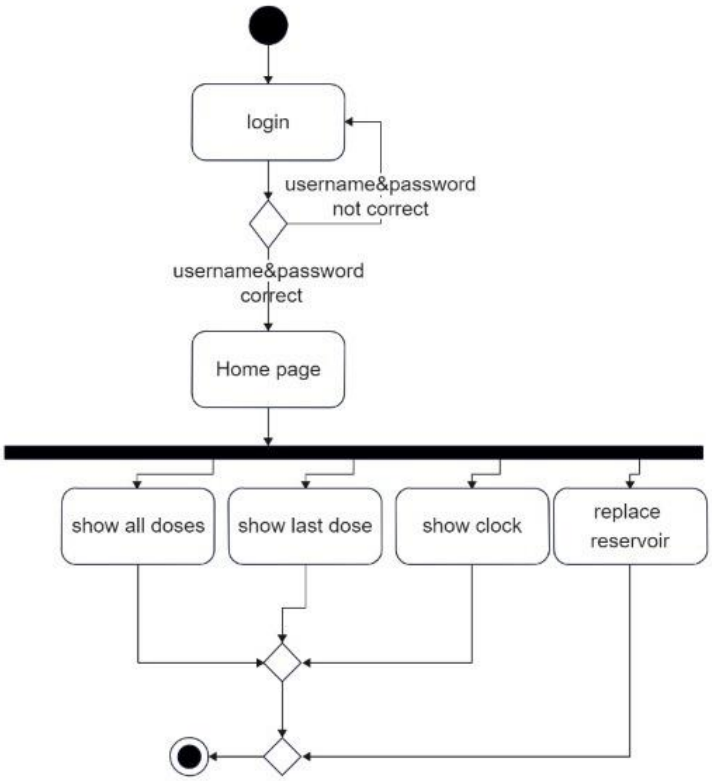
nurse use case



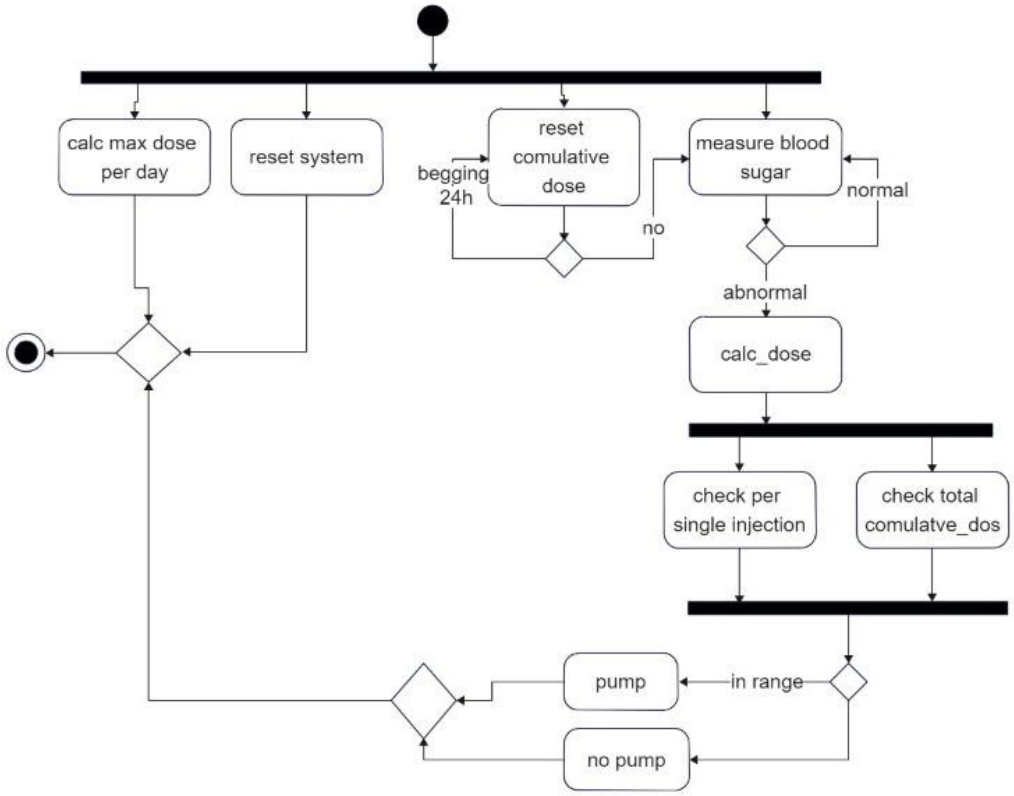
Insulin Pump Use Case:



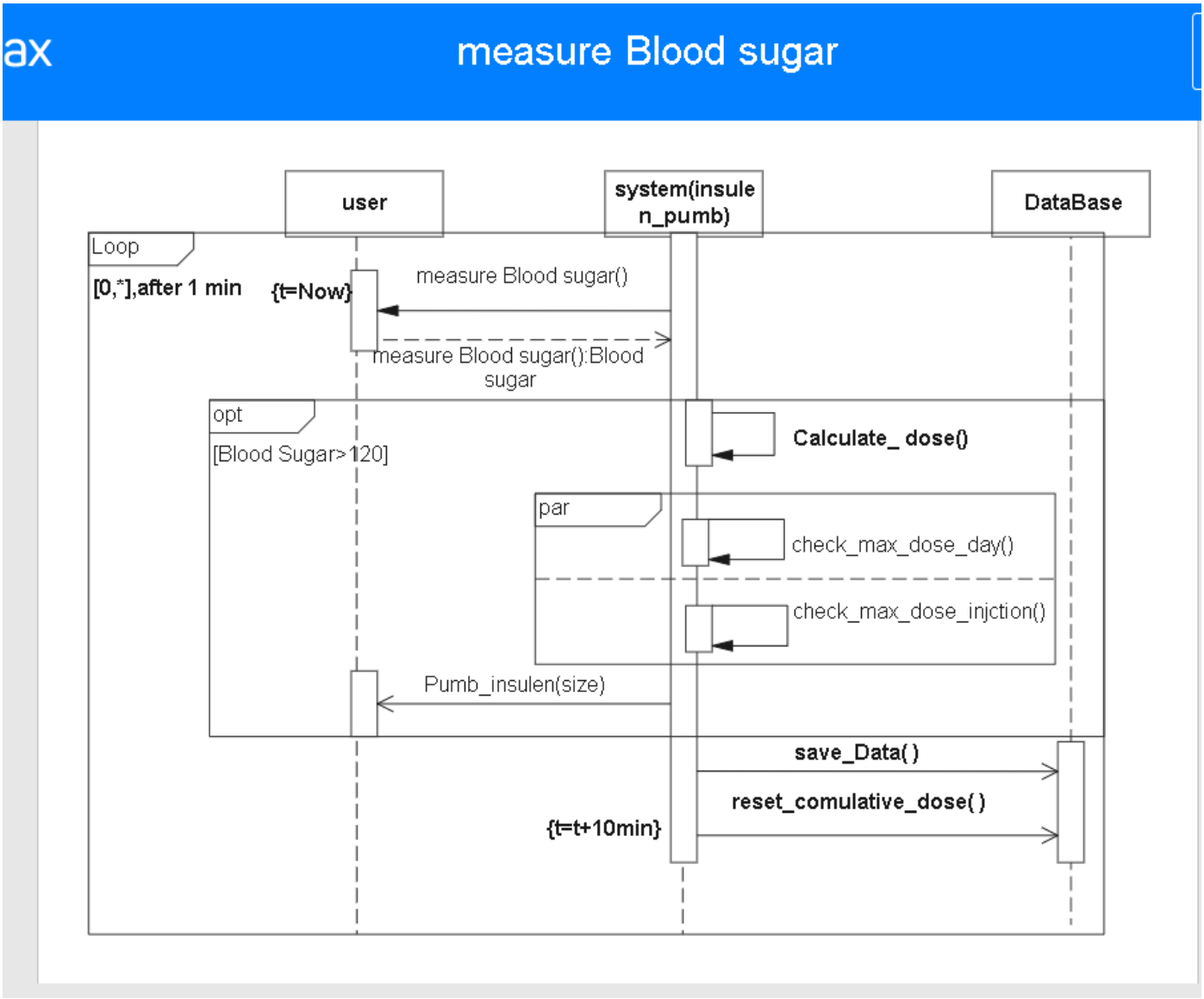
Activity Diagrams :

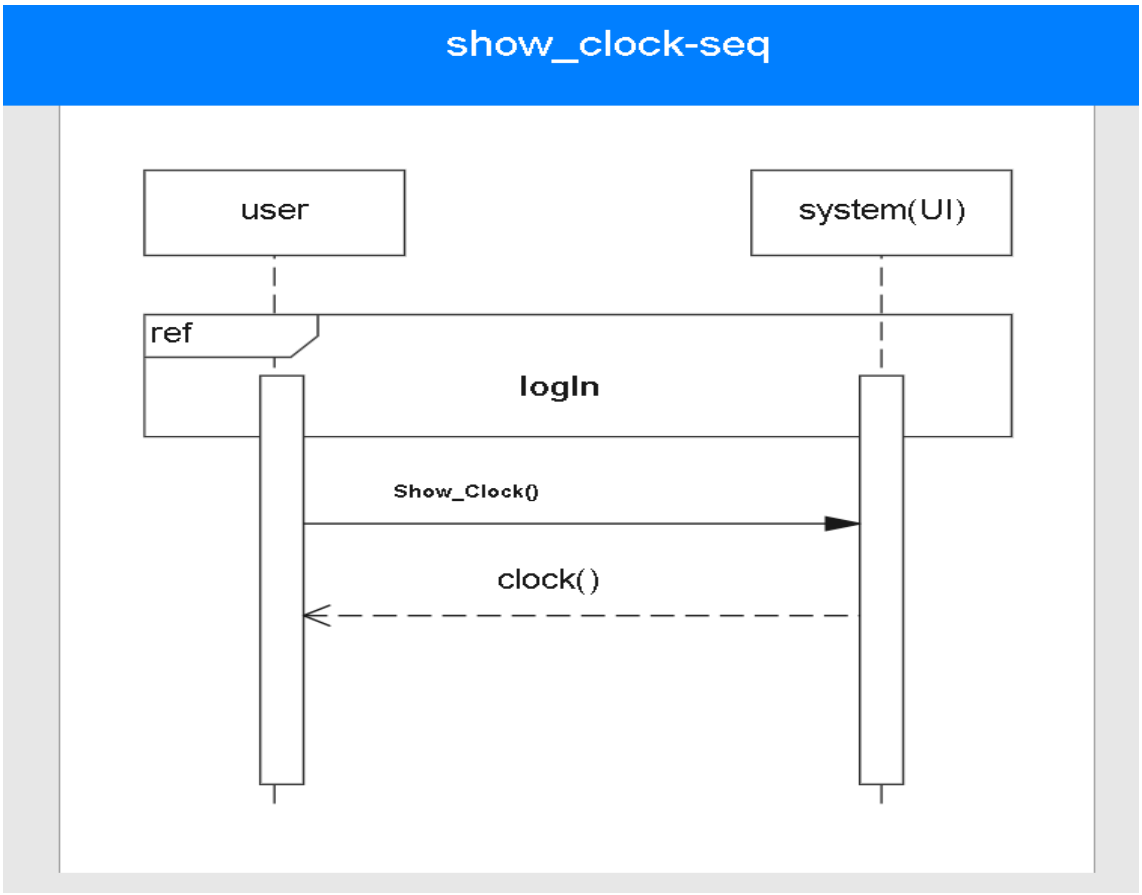


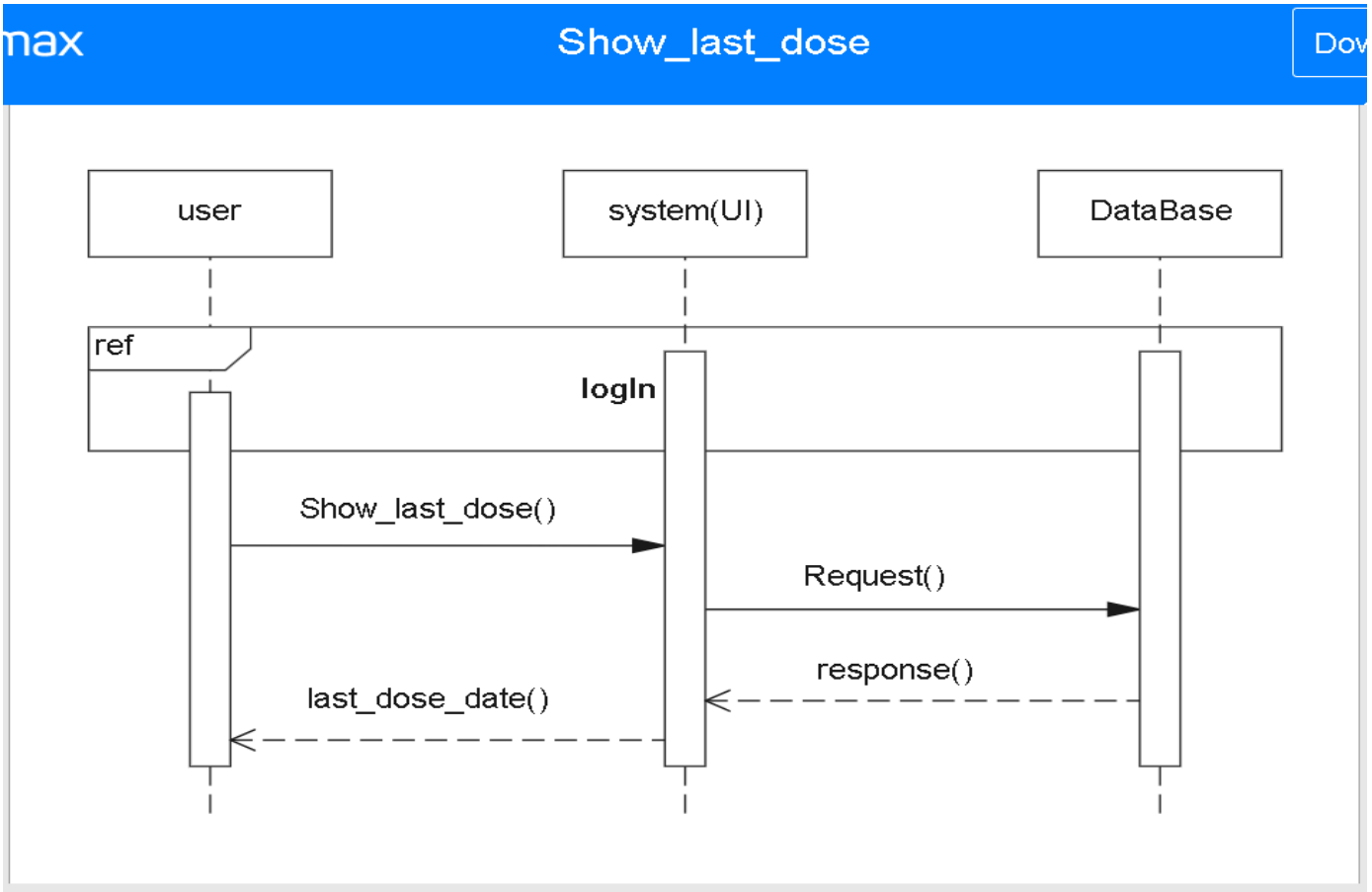
Insulin Pump Activity Diagram:



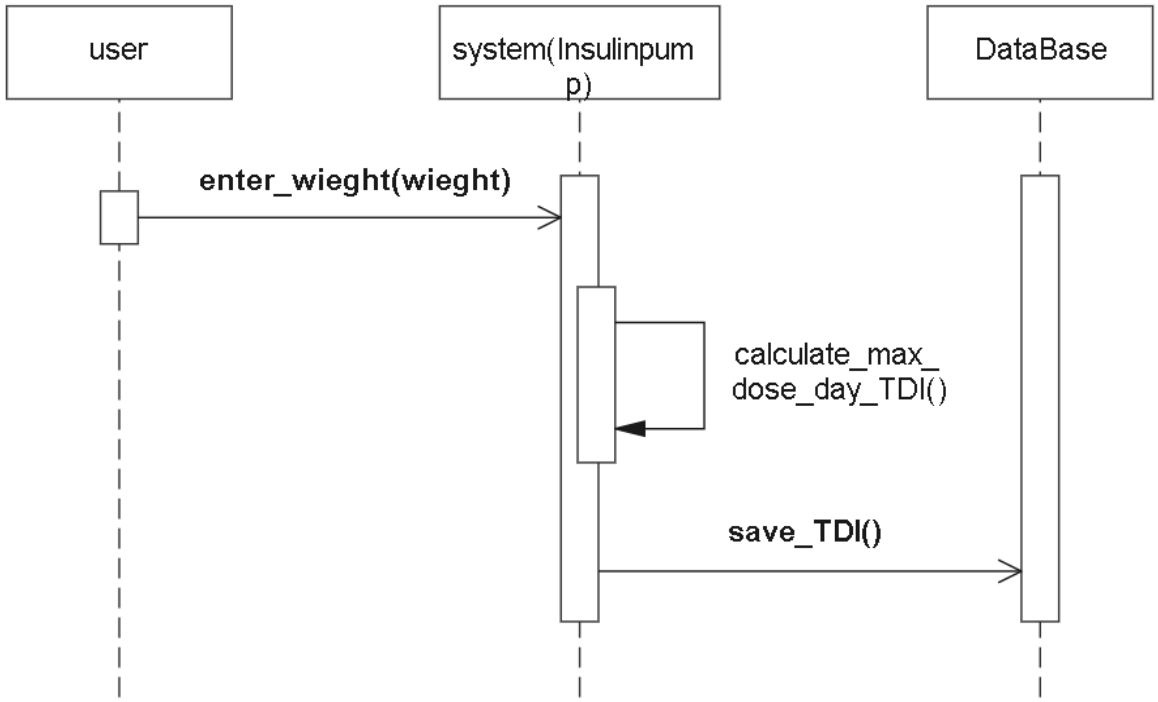
Sequence Diagram(s) :



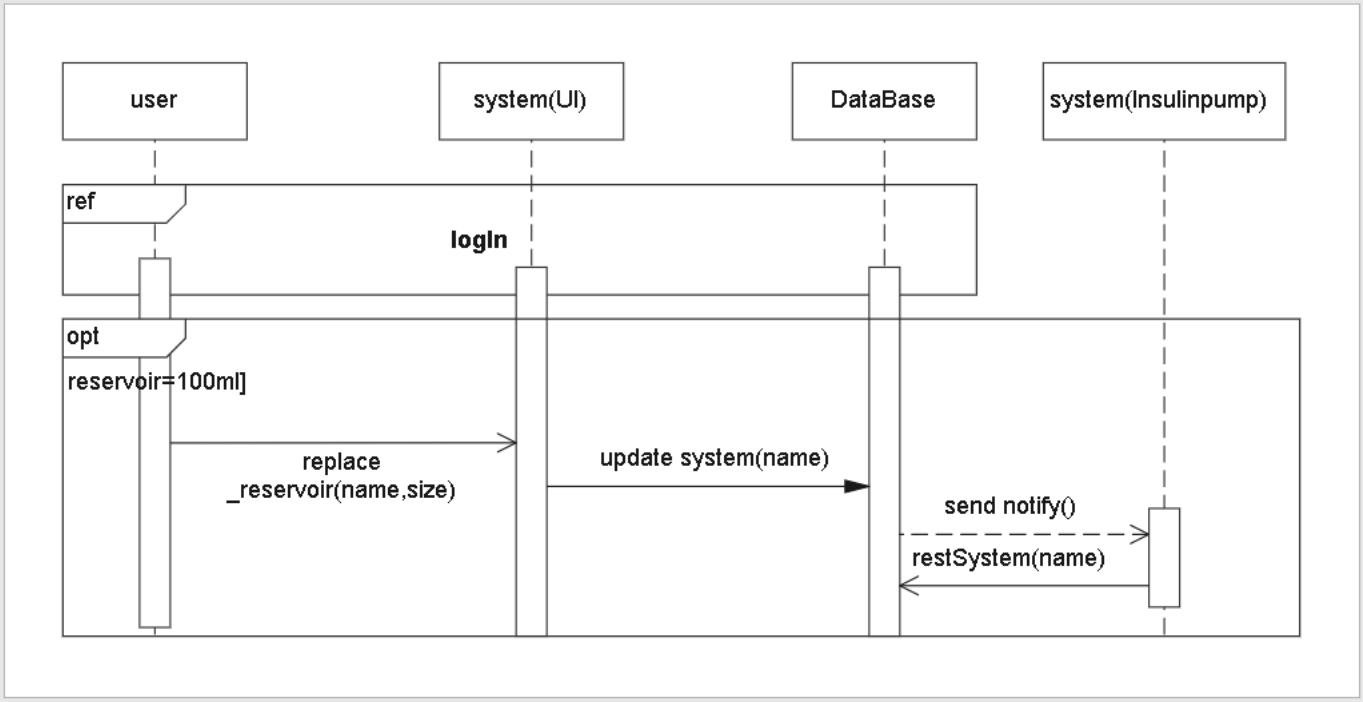

show_clock-seq
user
system(UI)
ref
logIn
Show_Clock()
clock()

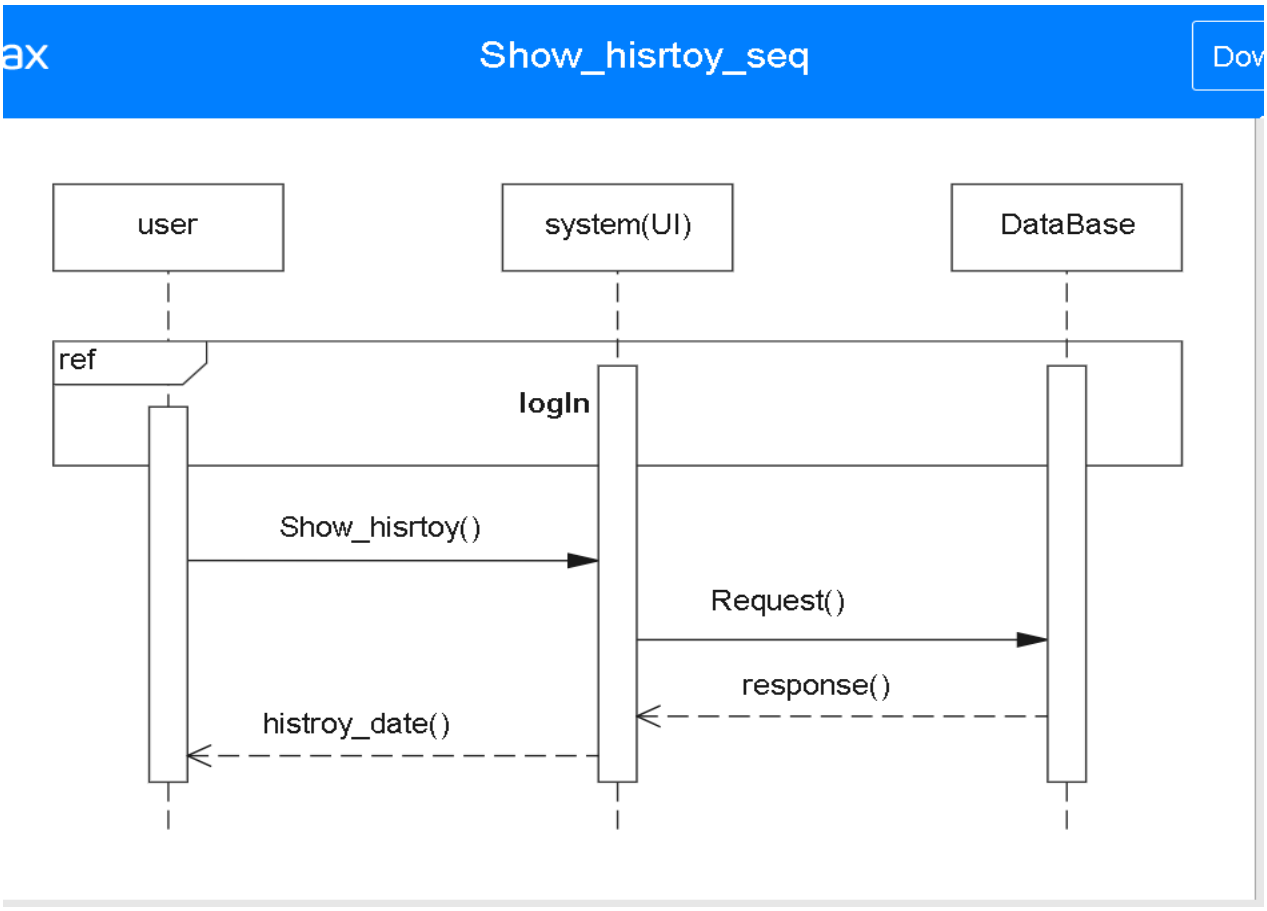

Show_last_dose
user
system(UI)
DataBase
ref
logIn
Show_last_dose()
Request()
response()
last_dose_date()

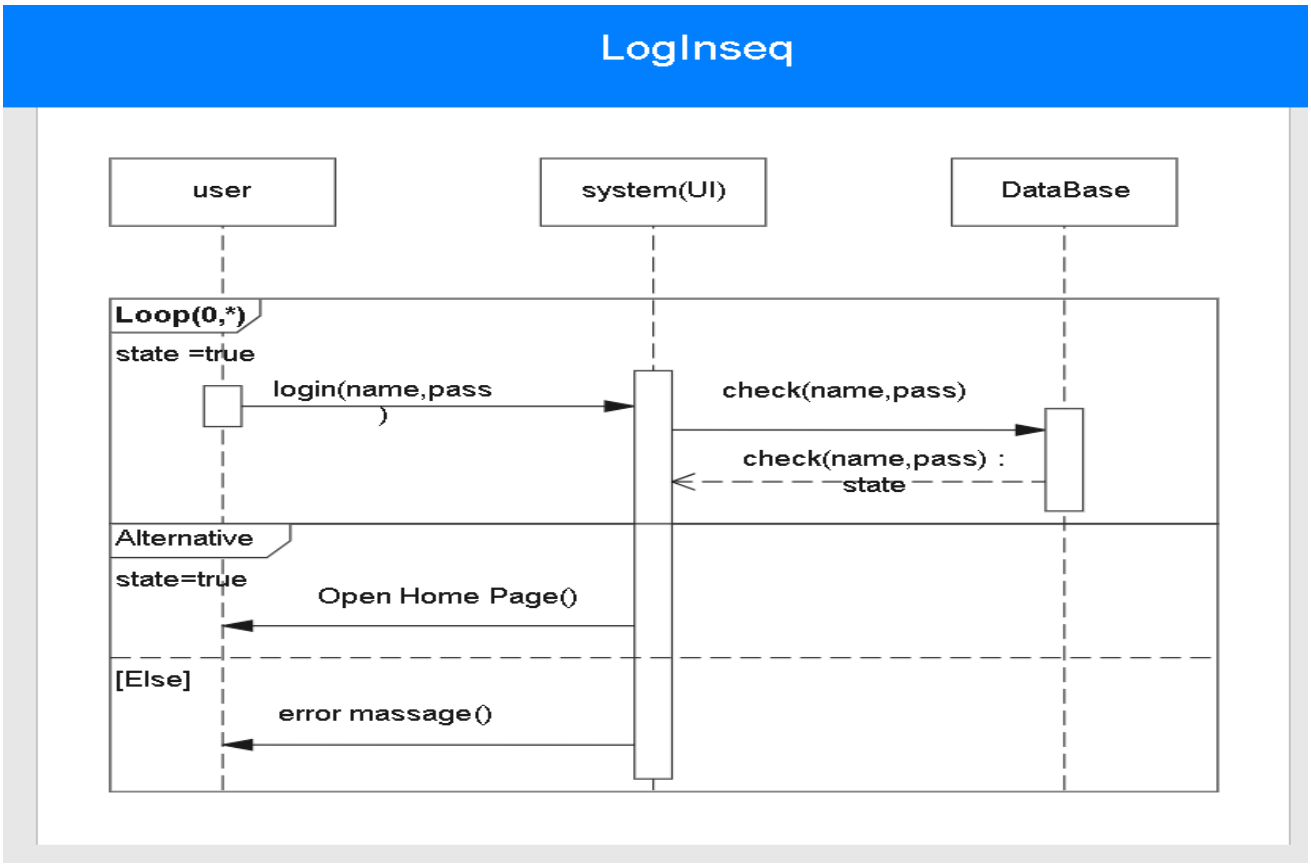
max max_dose_day_seq



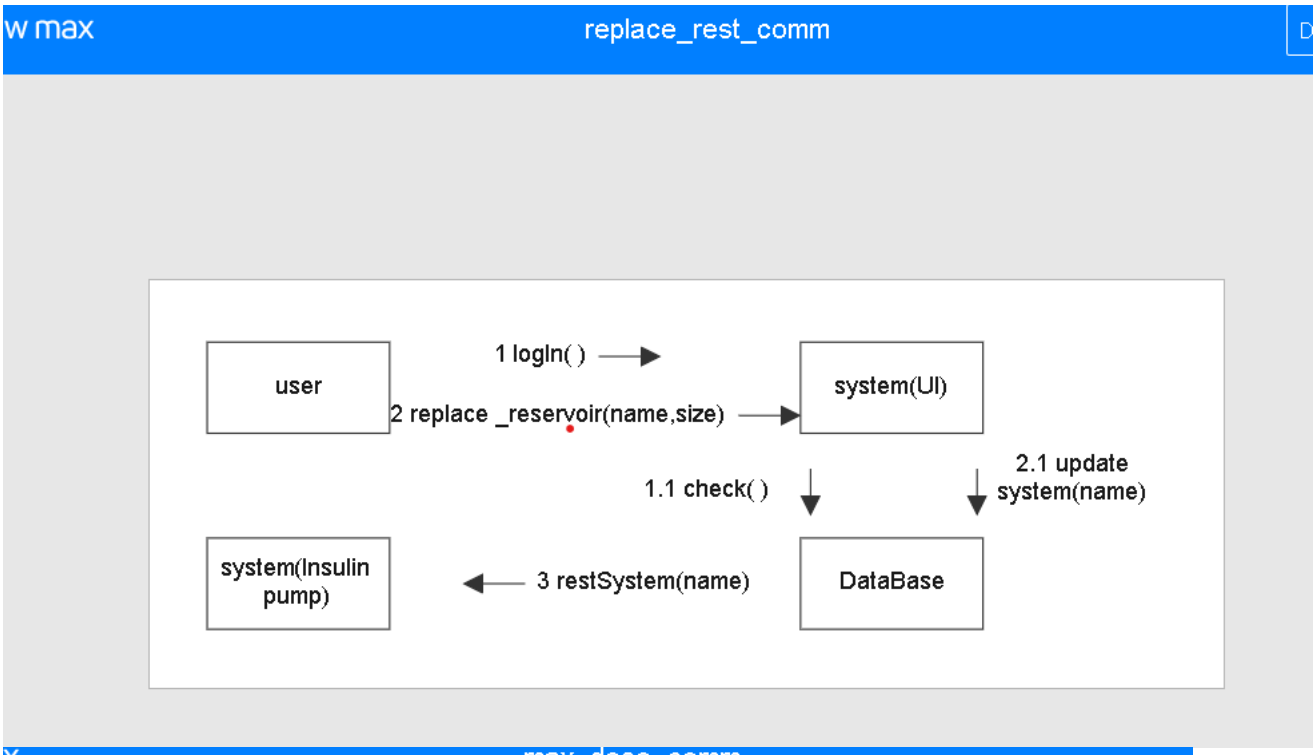
w max replace_and_reset_seq Downloa

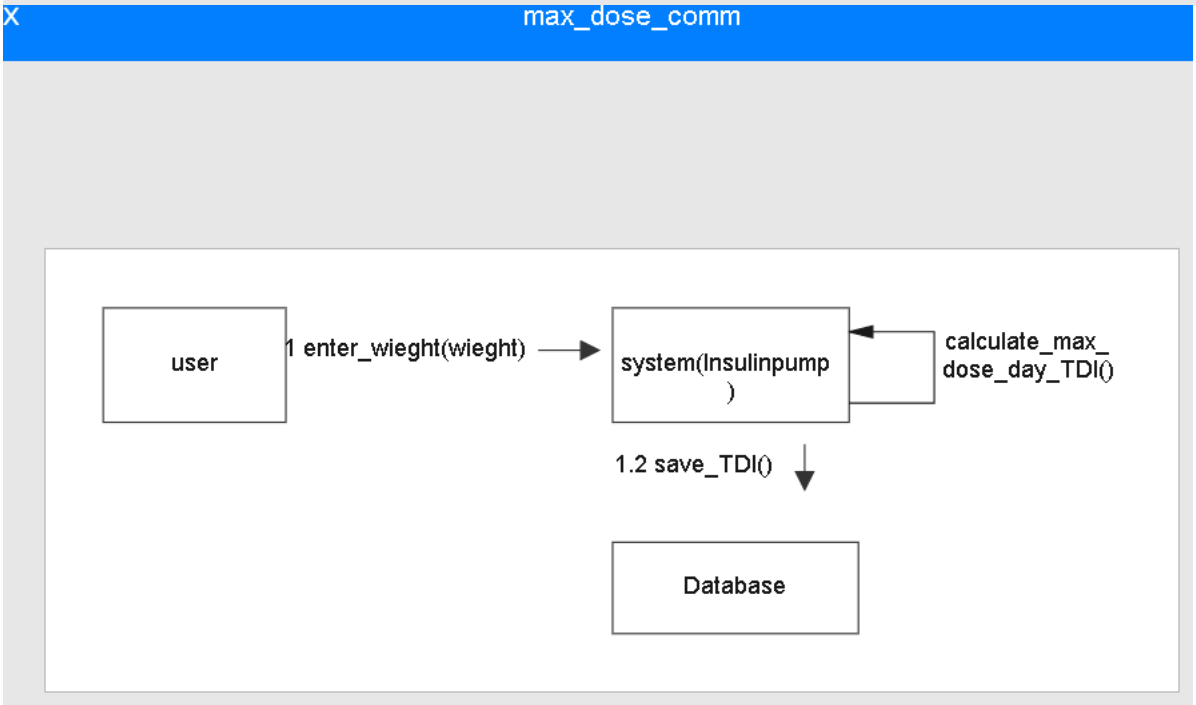



ax
Show_hisrtoy_seq
Dow
user
system(UI)
DataBase
ref
logIn
Show_hisrtoy()
Request()
response()
histroy_date()

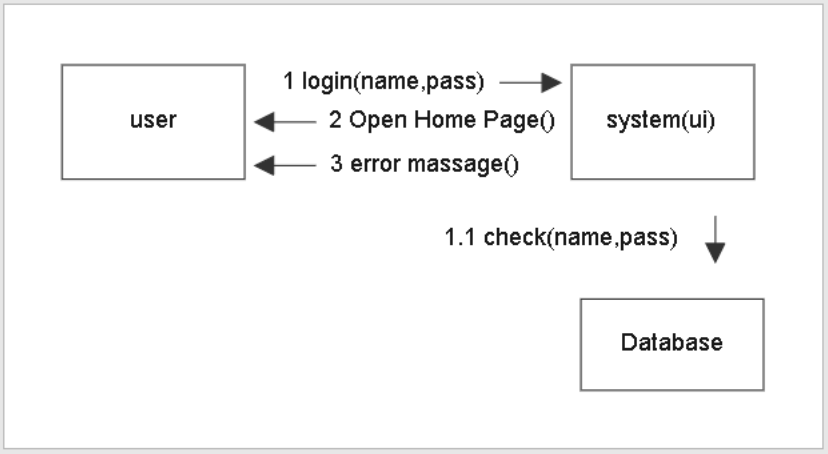

LogInseq
user
system(UI)
DataBase
Loop(0,*)
state =true
login(name,pass
)
check(name,pass)
check(name,pass) :
state
Alternative
state=true
Open Home Page()
[Else]
error massage()

Collaboration Diagrams:

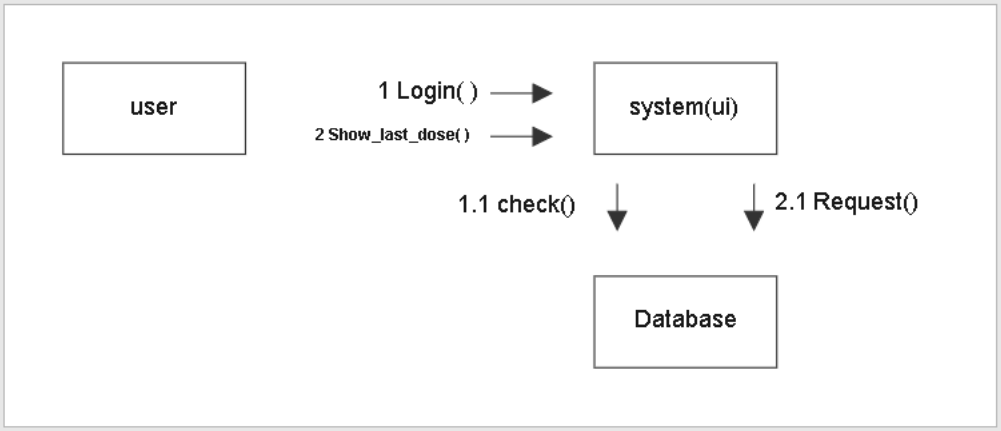


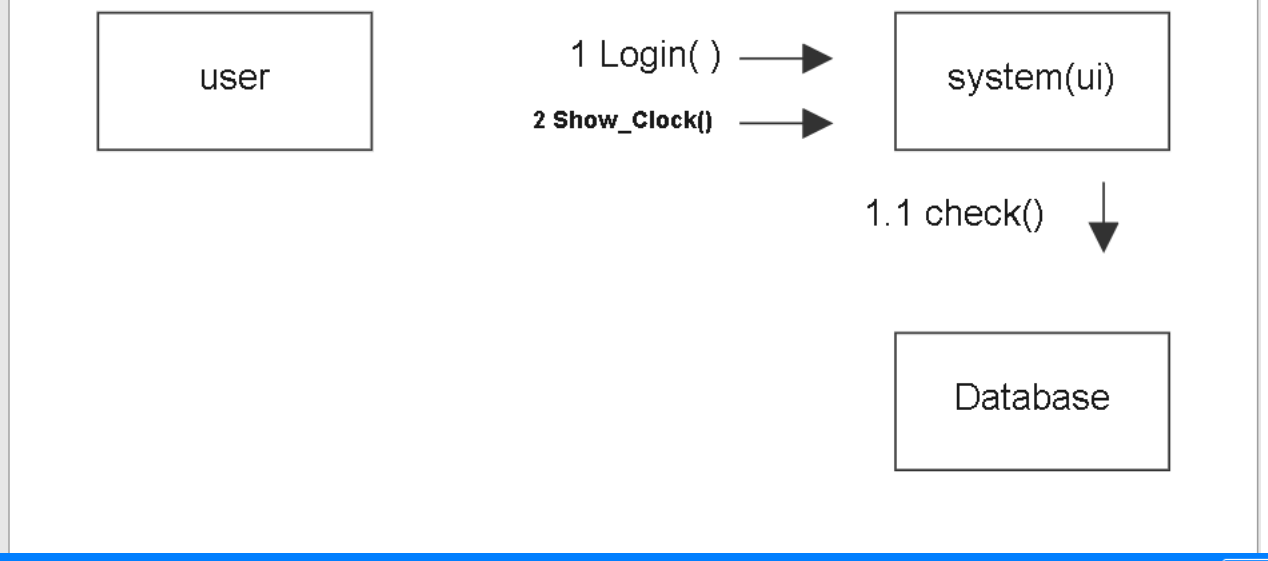


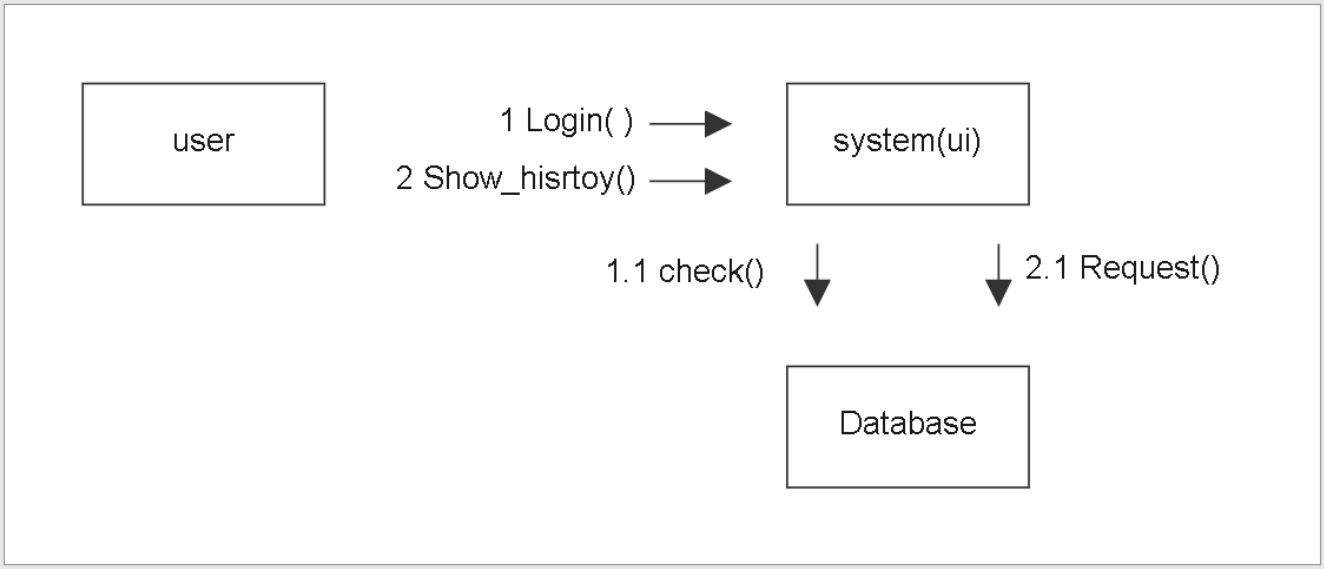
login_comm

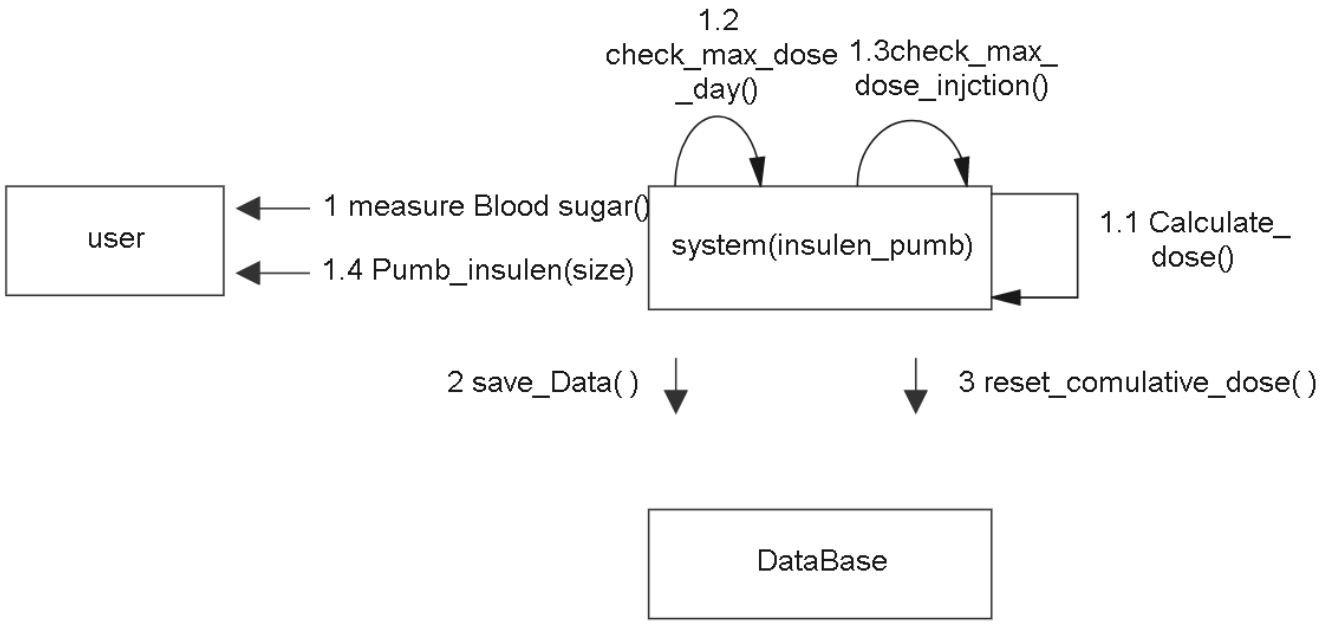


x last_dose_comm





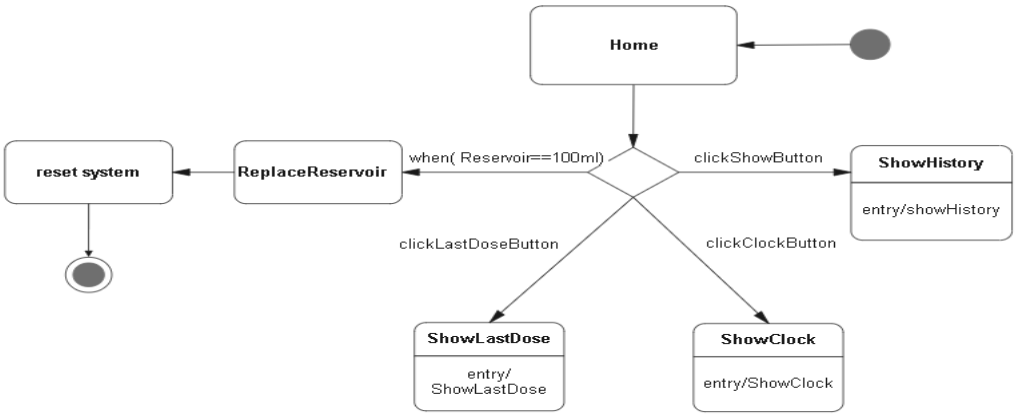




State-machine Diagram(s):

nurse State-machine Diagram:

nurse_state

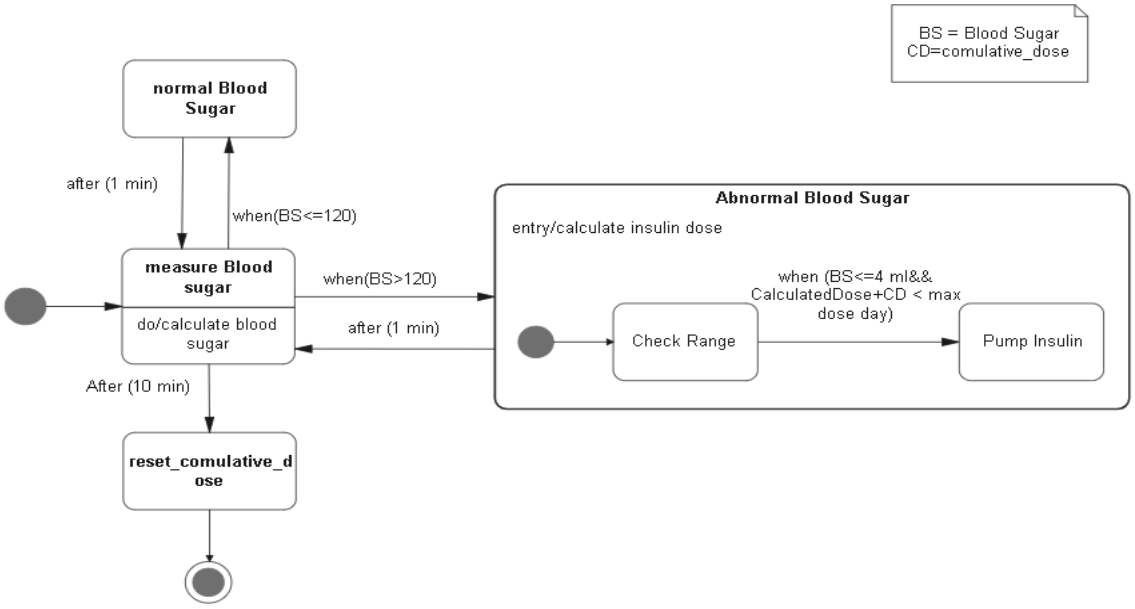


Table_nurse_State

	Home	ShowHistory	ShowClock	ShowLastDose	ReplaceReservoir	reset system
Home		clickShowButton	clickClockButton	clickLastDose Button	when(Reservoir==100ml)	
ShowHistory						
ShowClock						
ShowLastDose						
ReplaceReservoir						
reset system						

Insulin Pump state:

max insulin_pump_state



ax table_pump_state

	measure Blood sugar	normal Blood Sugar	Abnormal Blood Sugar	Pump Insulin	reset_comulative_dose
measure Blood sugar		when(BS<=120)	when(BS>120)		After (10 min)
normal Blood Sugar	after (1 min)				
Abnormal Blood Sugar	after (1 min)			when (BS<=4 ml&& CalculatedDose+CD < max dose day)	
Pump Insulin					
reset_comulative_dose					

Class diagram :