

# OSP stage 2040

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## Intelligent Elevator Controller

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# Activity 2041. Design Real Use Cases

## 1. Open Door

Use Case	1. Open Door
Actor	Passenger
Purpose	Open the elevator door.
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.1, R1.1.2, R1.1.3, R2.1.1 UseCase : CloseDoor, MoveEle, InputButton
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the opendoor Button in ButtonBox or (A) the outside of elevator Passenger input the FloorButton or (S) Elevator arrived at the selected floor 2. (S) Open the elevator Door 3. (S) reset the OpenTimer 4. (S) delete the Current Floor at the FloorButton Data 5. (S) OpenTimer is exceed the fixed time 6. (S) When fixed time exceed, Close the elevator door
Alternative Courses of Events	None
Exceptional Courses of Events	Line6. When Passenger input the OpenDoor Button, OpenTimer is reseted

# Activity 2041. Design Real Use Cases

## 2. Close Door

Use Case	2. Close Door
Actor	Passenger
Purpose	Close the Door
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.1, R1.1.2, R2.1.1, R3.1, R3.2, R5.1, R5.3 UseCase : OpenDoor, CloseDoor, InputButton, WeightConfirm SafeDoor, SearchGuest, DatabaseInput
Pre-Requisites	Elevator Door should Opened
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the CloseDoor Button in ButtonBox or (A) OpenTimer time limit exceeded 2. (S) Check the Weight in Elevator 3. (S) Check the recognition Sensor 4. (S) Create New Camera Picture. 5. (S) Calculating the Passenger Number 6. (S) Create New Passenger. 7. (S) Input to the New Passenger. (userIn, Infloor, startTime) 7. (S) Calculating the Dropped Passenger's Time 8. (S) Input to the DataBase
Alternative Courses of Events	None
Exceptional Courses of Events	Line1.1 when Both OpenDoor Button and CloseDoor Button inputed, OpenDoor is valid.

# Activity 2041. Design Real Use Cases

## 3. MoveEle

Use Case	3. MoveEle
Actor	None
Purpose	Elevator Moving
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R2.1.1, R3.3, R3.4, R3.5, R3.6 UseCase : OpenDoor, InputButton, DisplayTimer, LocationDisplay, InformDanger, AutoWait
Pre-Requisites	– Elevator Door Should Closed
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the Floor Button in ButtonBox or (S) If no one in the elevator, executing the auto wait system 2. (S) Check the Elevator DoorState 3. (S) Update the WaitTime 4. (S) Update the Current Floor 5. (S) Check the CheckDanger Data as Sensor
Alternative Courses of Events	None
Exceptional Courses of Events	– If Elevator Moved, OpenDoor Button is invalid

# Activity 2041. Design Real Use Cases

## 4. InputButton

Use Case	4. InputButton
Actor	Passenger
Purpose	Get the Passenger's Button Input
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.1, R1.1.2, R1.1.3, R2.1.1, R2.1.2, R2.2, R2.3 ,R3.5 UseCase : OpenDoor, CloseDoor, MoveEle, InputButton, CancelButton, Call Admin, MultilInput, DisplayTimer
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System * (A) Input Button. -> (S) executing the MultilInput fucntion. * (A) Input floor button. -> (S) elevator moved * (A) Input the OpenDoor Button or CloseDoor Button -> (S) executing OpenDoor or CloseDoor * (A) Input CallAdmin button. -> (S) executing the CallAdmin * (A) Input the exterior Button -> (S) Display the wait time
Alternative Courses of Events	None
Exceptional Courses of Events	- If Both Current Floor and Input Floor equal, FloorButton canceled

# Activity 2031. Define Essential Use Cases

## 5. CancelButton

Use Case	5. CancelButton
Actor	Passenger
Purpose	Cancel the Inputed Button
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R2.1.1, R2.1.2, R2.3 UseCase : MoveEle, MultiInput, InputButton
Pre-Requisites	- Button already Selected
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Input the FloorButton 2. (S) Cancel the FloorButton 3. (S) Cancel the All ButtonBox 4. (S) Elevator move or stop
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 6. CallAdmin

Use Case	6. CallAdmin
Actor	Passenger
Purpose	Call Admin
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R2.1.1, R2.2 UseCase : InputButton, CallAdmin
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the CallAdmin Button in ButtonBox 2. (S) executing the CallAdmin Function
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 7. MultiInput

Use Case	7. MultiInput
Actor	None
Purpose	if one ButtonBox get the Button, several ButtonBox display the Input Button on same time
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R2.1.1, R2.1.2, R2.3 UseCase : InputButton, CancelButton, MultiInput
Pre-Requisites	Elevator have Several ButtonBox
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the Button in ButtonBox 2. (S) Elevator is sending the Input Button to all ButtonBox
Alternative Courses of Events	None
Exceptional Courses of Events	None



# Activity 2041. Design Real Use Cases

## 8. WeightConfirm

Use Case	8. weightConfirm
Actor	None
Purpose	Check the all Passenger's weight
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.2, R3.1 UseCase : CloseDoor, WeightConfirm
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Elevator Door Closed 2. (S) Get the elevator motor's voltage through CheckWeight 3. (S) Compare Weight Data with Weight limit 4. (S) Beep and OpenDoor
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 9. SafeDoor

Use Case	9.SafeDoor
Actor	None
Purpose	Check to see if things will be between the door.
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.1, R1.1.2, R3.2 UseCase : OpenDoor, CloseDoor, SafeDoor
Pre-Requisites	– Elevator Door is opened
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Elevator Door is closed 2. (S) Get the Sensor Data by CheckClose 3. (S) If CheckClose is 1, executing the OpenDoor
Alternative Courses of Events	None
Exceptional Courses of Events	Line1. If SafeDoor CheckData is 1, CloseDoor Button is invalid

# Activity 2041. Design Real Use Cases

## 10. AutoWait

Use Case	10. AutoWait
Actor	None
Purpose	When the elevator is not in use, place Elevator through DataBase
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R5.1, R5.4 UseCase : MoveEle, SeachGuest, DatabaseCalc, SetCamDb
Pre-Requisites	- elevator is not in use
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) No Input Button 2. (S) Get the PictureData through the Camera 3. (S) Get the CurrentTime 4. (S) Get the Calculate Data coincident with CurrentTime through DB_Calc's Data 5. (S) Get the Current Floor 7. (S) Get the MaxFloor 8. (S) Get the destination floor through CurrentFloor, Priority, MaxFloor, Setup Data 9. (S) Move to destination floor
Alternative Courses of Events	None
Exceptional Courses of Events	- If administrator would set the not use this Function, do not executing

# Activity 2041. Design Real Use Cases

## 11. InformDanger

Use Case	11. InformDanger
Actor	None
Purpose	Check the Elevator Location and Informing the Danger
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R3.4 UseCase : InformDanger, MoveEle
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Get the Data through CheckFloor sensor 2. (S) Get the Elevator Location through sensor data 3. (S) Judge the danger 4. (S) Executing CallAdmin or SMSsend
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 12. DisplayTimer

Use Case	12. DisplayTimer
Actor	None
Purpose	Display the expectation wait time to the Passeng
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R2.1.1, R3.5, R3.7 Usecase : Inputbutton, DisplayTimer, TimerCalc, MoveEle
Pre-Requisites	– Passenger is input the exterior ButtonBox
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Passenger input the exterior Button in ButtonBox 2. (S) Get the Input Floor 3. (S) Get the CurrentFloor 4. (S) Get the FloorButton 5. (S) Executing the TimerCal 6. (S) Display the WaitTime 7. (S) Updated every moving the elevator
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 13. LocationDisplay

Use Case	13. LocationDisplay
Actor	None
Purpose	Display the current elevator location.
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.3, R3.6 UseCase : LocationDisplay, MoveEle
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Get the current elevator floor through sensor of CheckFloor 2. (S) Display the current elevator 3. (S) Display the moving direction 4. (S) Updated every moving the elevator
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 14. TimerCalc

Use Case	14. TimerCalc
Actor	None
Purpose	Calculating the Wait time
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R2.1.1, R3.5, R3.7 UseCase : DisplayTimer, TimerCalc
Pre-Requisites	- Passenger input the exterior Button in ButtonBox
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Compare Input floor with CurrentFloor. 2. (S) Get the Database of Waittime for 3month 3. (S) Calculating the WaitTime through Excluding the results of sub-15% and the top-15% average 4. (S) Call the DisplayTimer 5. (S) Display the WaitTime
Alternative Courses of Events	None
Exceptional Courses of Events	Line1. If Input floor equal with CurrentFloor, invalid

# Activity 2041. Design Real Use Cases

## 15. SetupFloor

Use Case	15. SetupElevator
Actor	Admin
Purpose	Setup the elevator operation information
Overview	(As in the business use case)
Type	Secondary
Cross Reference	System functions R2.1.1, R4.1 UseCase : InputButton, SetupFloor
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Connect to the Admin Mode 2. (S) Press Password 3. (A) Setup the FloorSetup 4. (S) Save the setup data 5. (S) Apply to the current system
Alternative Courses of Events	None
Exceptional Courses of Events	None



# Activity 2041. Design Real Use Cases

## 16. SetupCamDB

Use Case	16. SetupCamDB
Actor	Admin
Purpose	Setup the camera and database
Overview	(As in the business use case)
Type	Secondary
Cross Reference	System functions R3.3, R4.2, R5.1, R5.2, R5.3, R5.4 UseCase : AutoWait, SetupCamDB, SearchGuest, SearchDanger, DatabaseCalc, DatabaseInput
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Connect to the Admin Mode 2. (S) Press Password 3. (A) Setup the Camera on/off, Search Passenger on/off, InformDanger on/off, DB on/off, Au toWait on/off ..... 4. (S) Save the setup data 5. (S) Apply to the current system
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 17. SetupTimer

Use Case	17. SetupTimer
Actor	Admin
Purpose	
Overview	(As in the business use case)
Type	Secondary
Cross Reference	System functions R4.3 UseCase : SetupTimer
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (A) Connect to the Admin Mode 2. (S) Press Password 3. (A) Setup the Auto Shutdown time and Auto PowerON time 4. (S) Save the setup data 5. (S) Get the CurrentTime 6. (S) Compare setuptime with CurrentTime 7. (S) SearchGuest at elevator 8. (S) Executing the auto on/off
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 18. SearchGuest

Use Case	18. SearchGuest
Actor	None
Purpose	Search Passenger at the elevator
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.2, R3.3, R4.2, R5.1, R5.3 UseCase : CloseDoor, SetupCamDB, SearchGuest, DatabaseInput, AutoWait
Pre-Requisites	- Check the SearchGuest Function operation existence
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Check the SearchGuest Function operation existence 2. (S) Door are Closed 3. (S) Get the PictureDate through Camera 4. (S) Send Picture to the Local PC 5. (S) Excluding the noise in a Picture 6. (S) Image Processing 7. (S) Tracking the Passenger Pointer 8. (S) When Door are closed, repeat the 2~7 9. (S) Calculating the Passenger Count, data 9. (S) Save the data to the database
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 19. SearchDanger

Use Case	19. SearchDanger
Actor	None
Purpose	Search the Endangered passenger
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R2.2, R4.2, R5.2 UseCase : CallAdmin, SetupCamDb, SearchDanger
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Check the SearchDanger Function operation existence 2. (S) Get the Guest through SearchGuest 2. (S) If People do not move for long time, executing the AdminCall or SMSSend
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 20. DatabaseInput

Use Case	20. DatabaseInput
Actor	None
Purpose	Actual database I/O
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R1.1.2, R5.1, R4.2, R5.4 UseCase : CloseDoor, SearchGuest, DatabaseCalc, SetupCamDb
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Request Save/Load the database 2. (S) Save/Load the PictureData, Passenger, Waittime
Alternative Courses of Events	None
Exceptional Courses of Events	None

# Activity 2041. Design Real Use Cases

## 21. DatabaseCalc

Use Case	21. DatabaseCalc
Actor	None
Purpose	Calculating the Database data
Overview	(As in the business use case)
Type	Primary and Real
Cross Reference	System functions R3.3, R4.2, R5.3, R5.4 UseCase : AutoWaitm SetupCamDb, DatabaseCalc, DatabaseInput
Pre-Requisites	None
UI Widgets	
Typical Course of Event	(A) : Actor, (S) : System 1. (S) Input the duration 2. (S) Input the class and option 3. (S) Calculating database 4. (S) calculated data is applied
Alternative Courses of Events	None
Exceptional Courses of Events	None

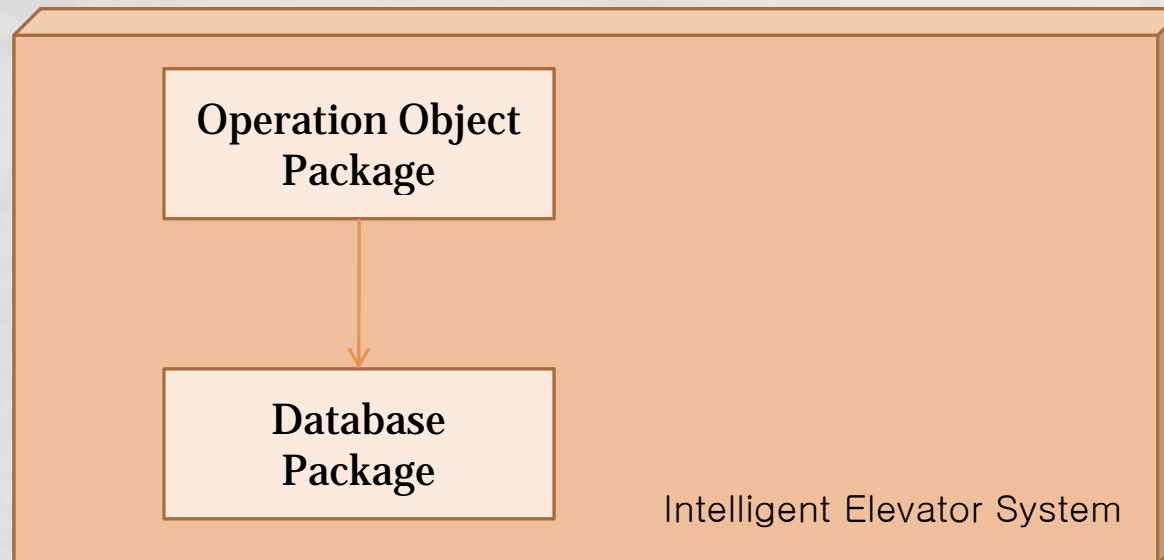
# Activity 2042. Define Reports, UI, and Storyboards

- ❖ Display current condition of Elevator and Waiting time



# Activity 2043. Refine System Architecture

## ❖ Step 1~3 : Drawing Deployment Diagram

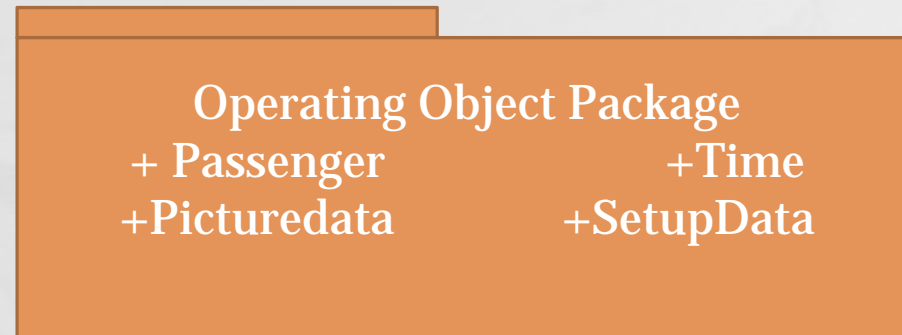




# Activity 2043. Refine System Architecture

## ❖ Step 4~7 : Drawing Package Diagram

Application Logic Layer

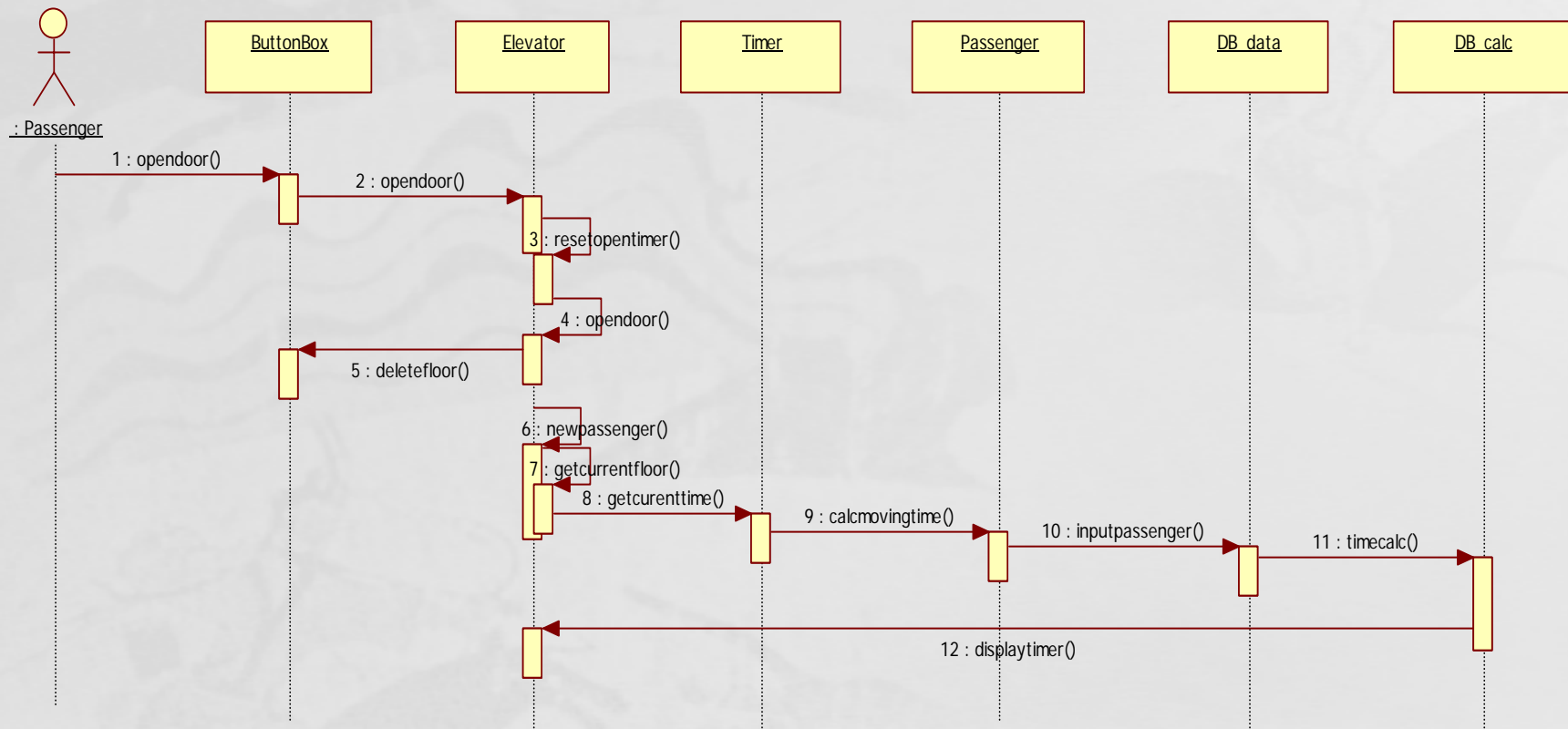


Storage Layer



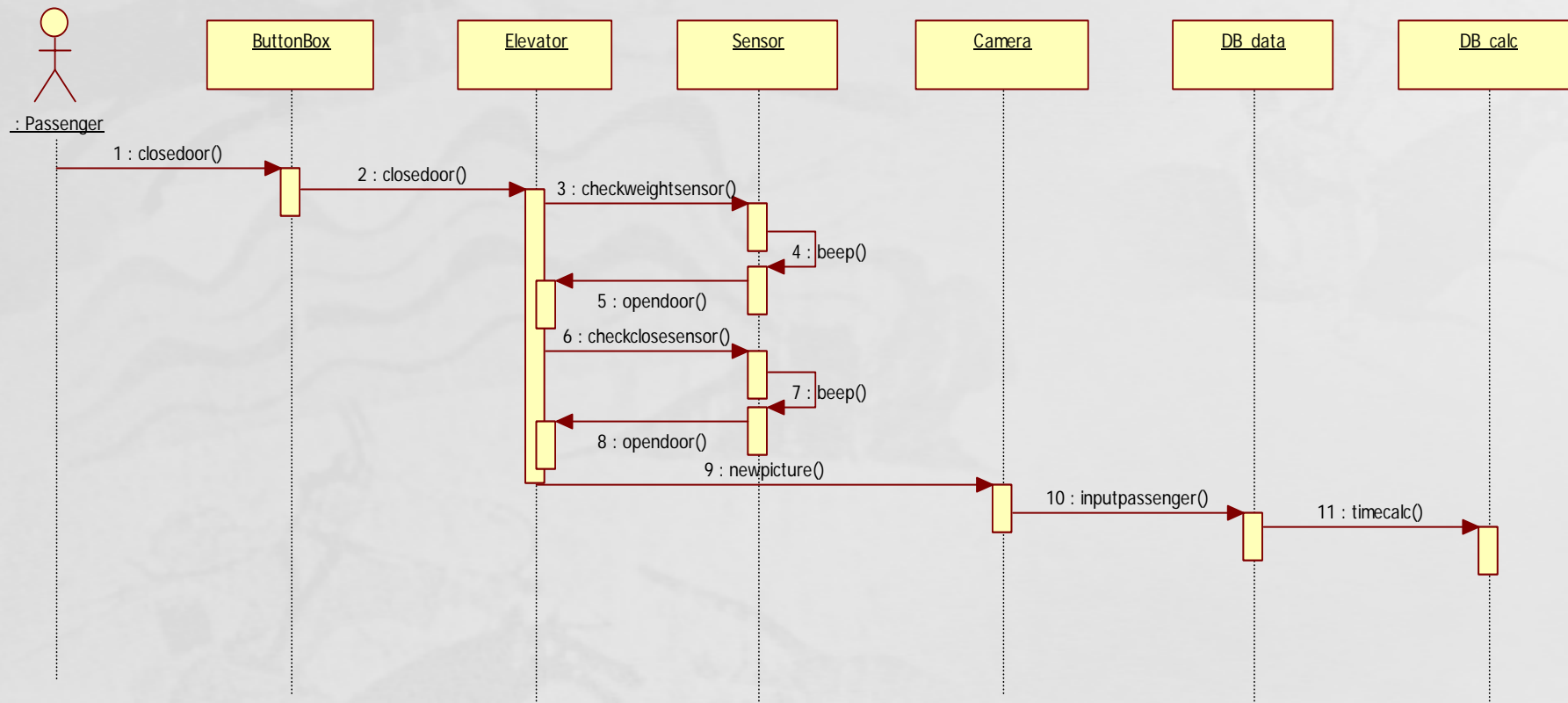
# Activity 2044. Define Interaction Diagrams

## 1. Open Door



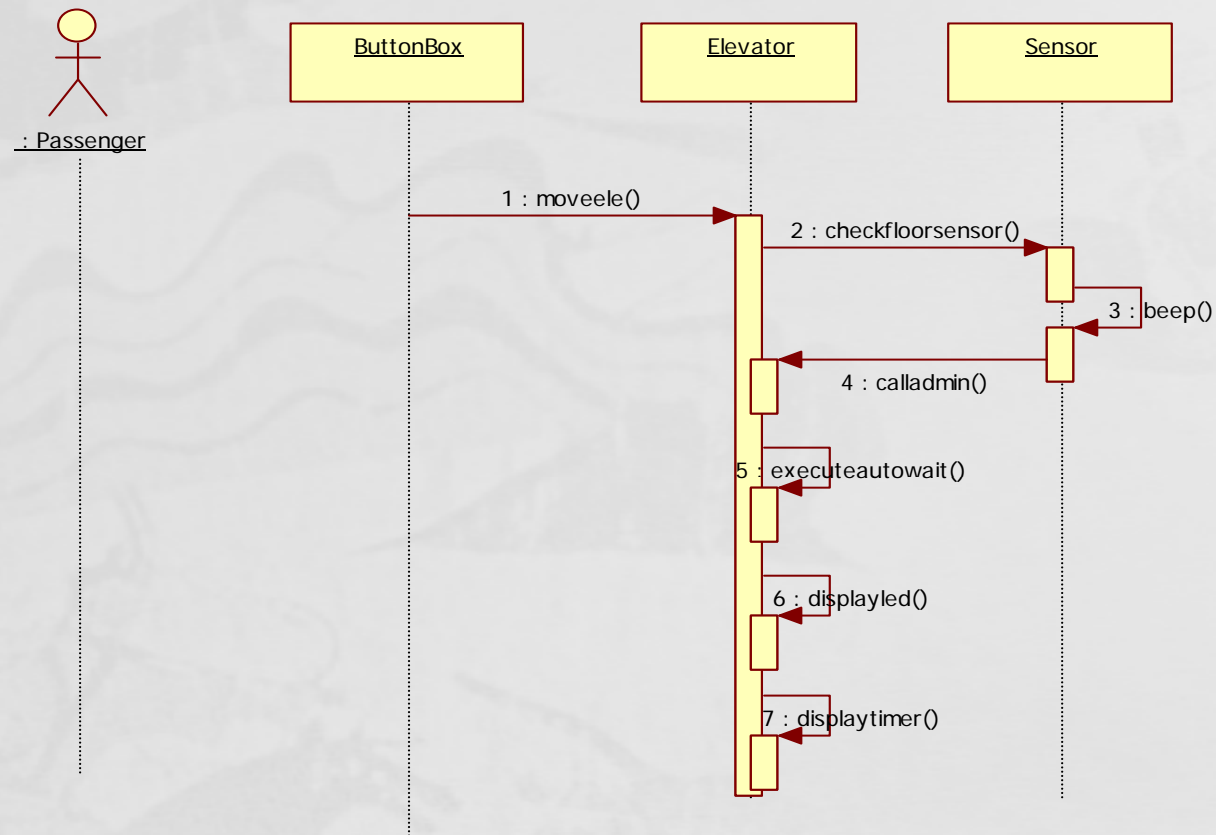
# Activity 2044. Define Interaction Diagrams

## 2. Close Door



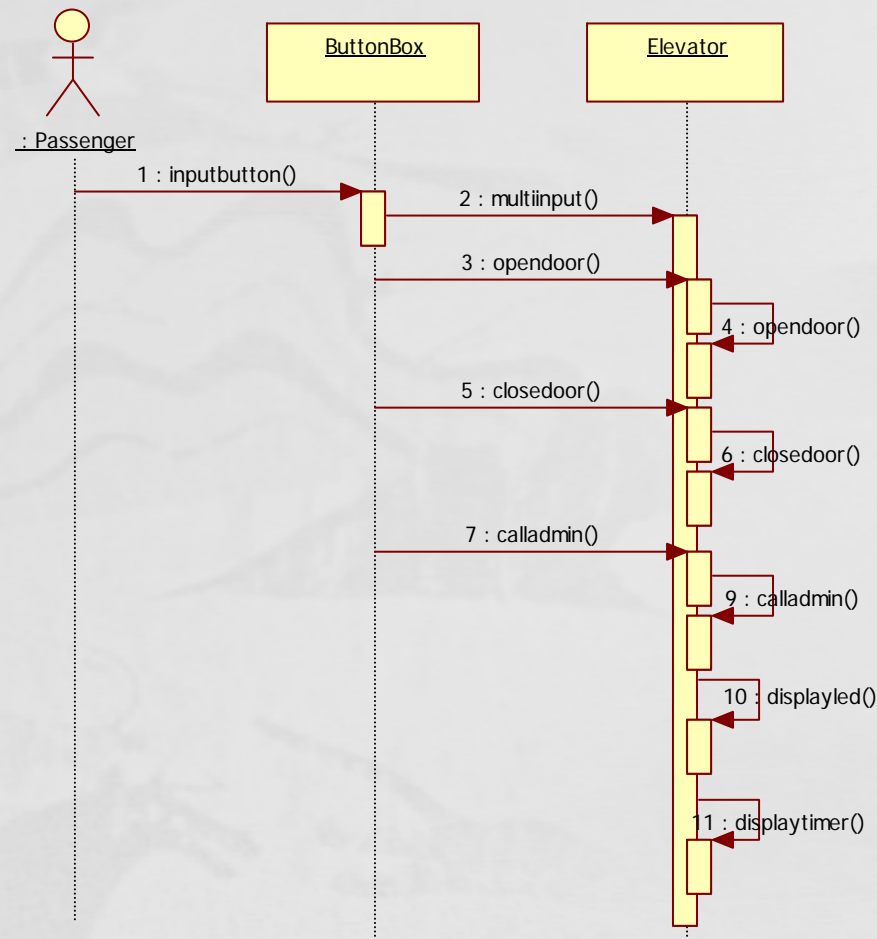
# Activity 2044. Define Interaction Diagrams

## 3. MoveEle



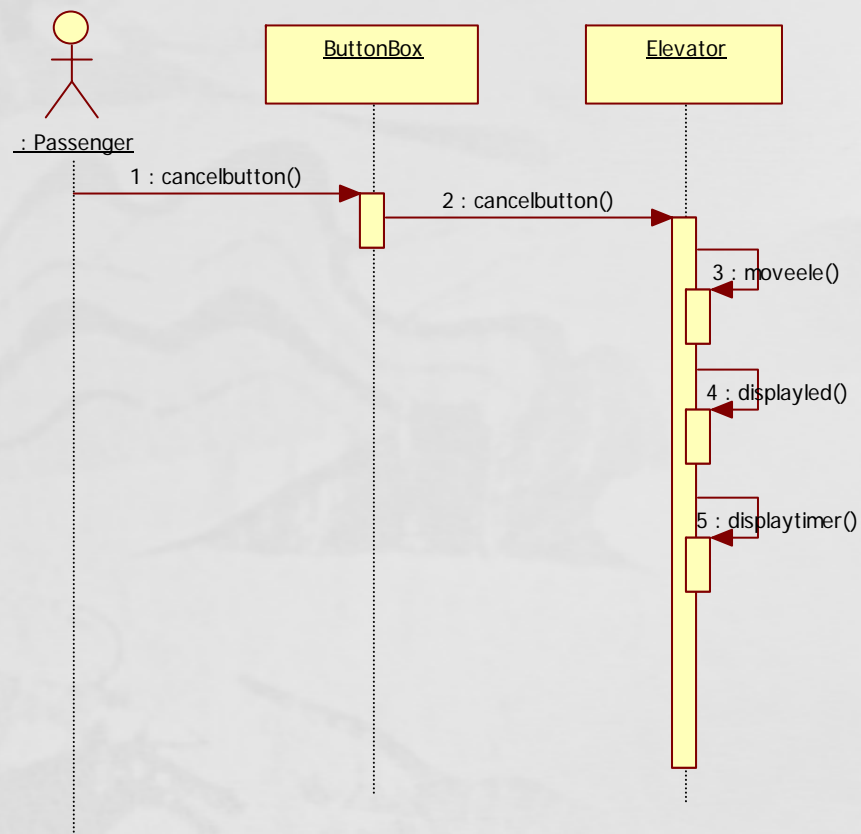
# Activity 2044. Define Interaction Diagrams

## 4. InputButton



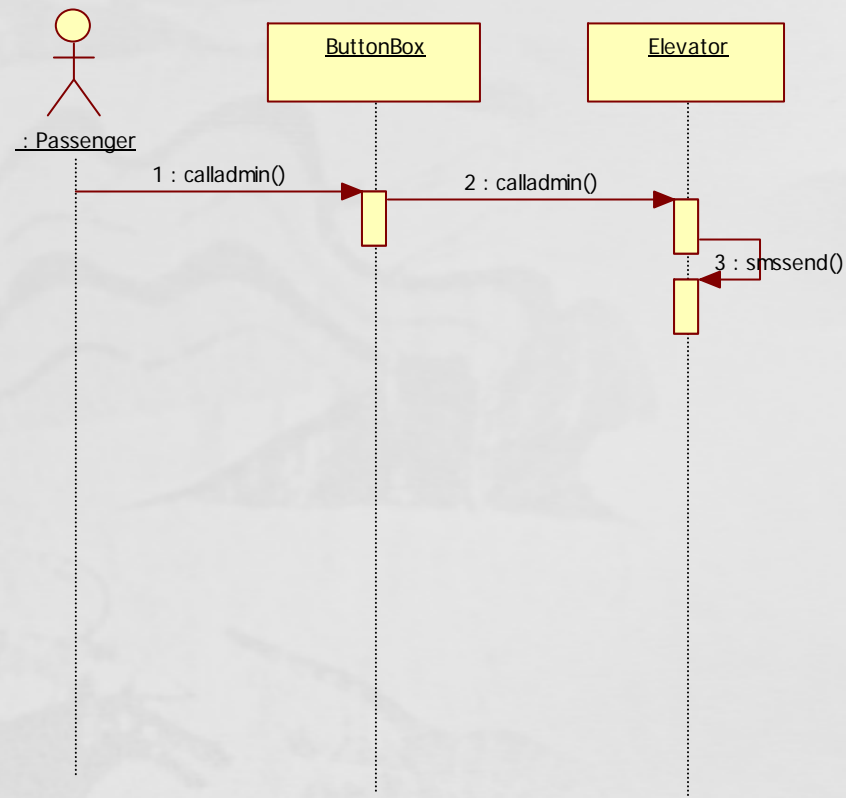
# Activity 2044. Define Interaction Diagrams

## 5. CancelButton



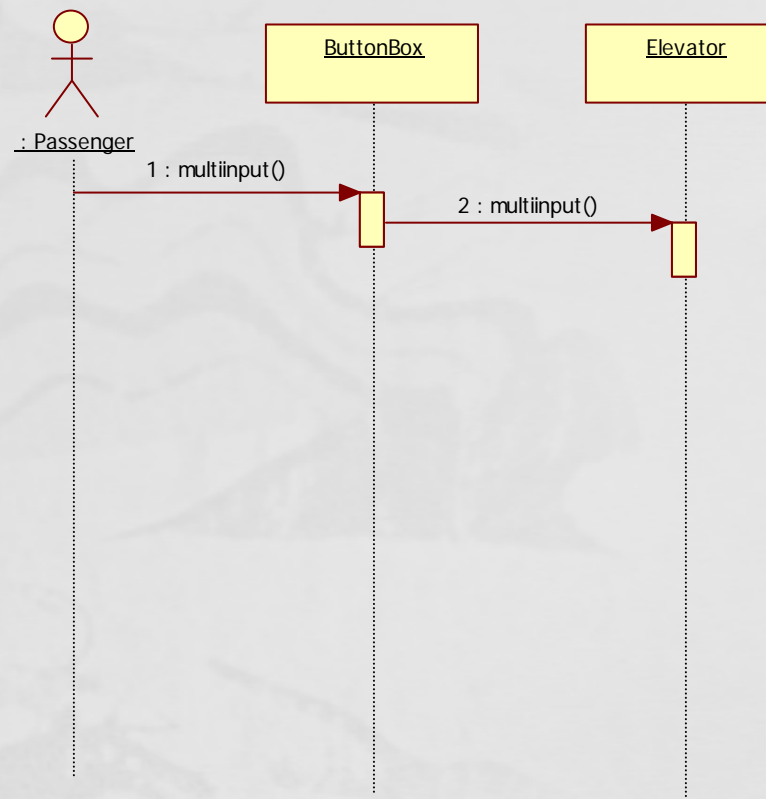
# Activity 2044. Define Interaction Diagrams

## 6. CallAdmin



# Activity 2044. Define Interaction Diagrams

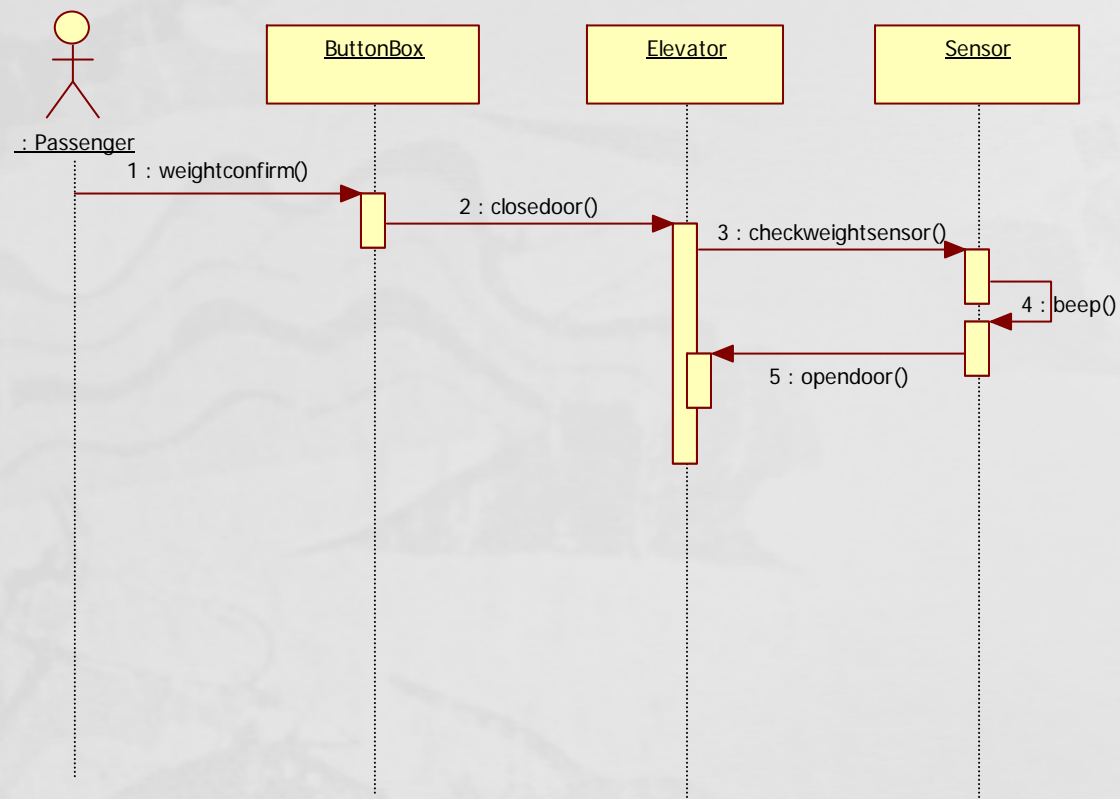
## 7. MultiInput





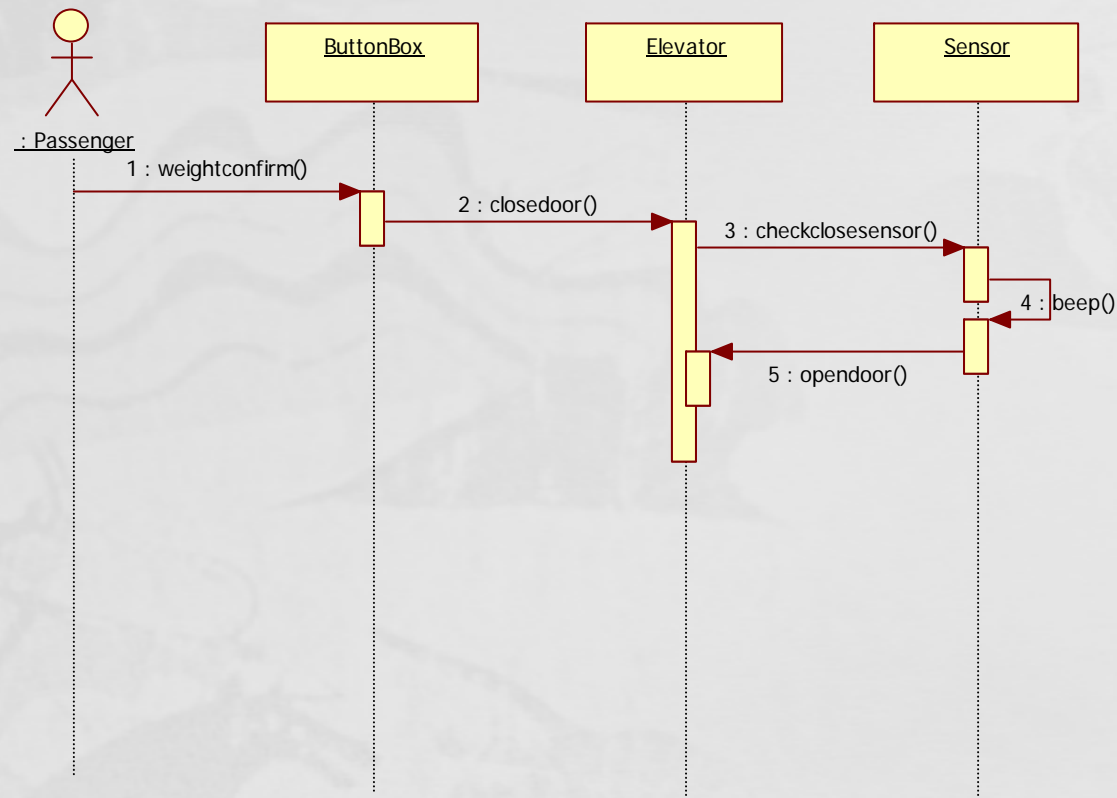
# Activity 2044. Define Interaction Diagrams

## 8. WeightConfirm



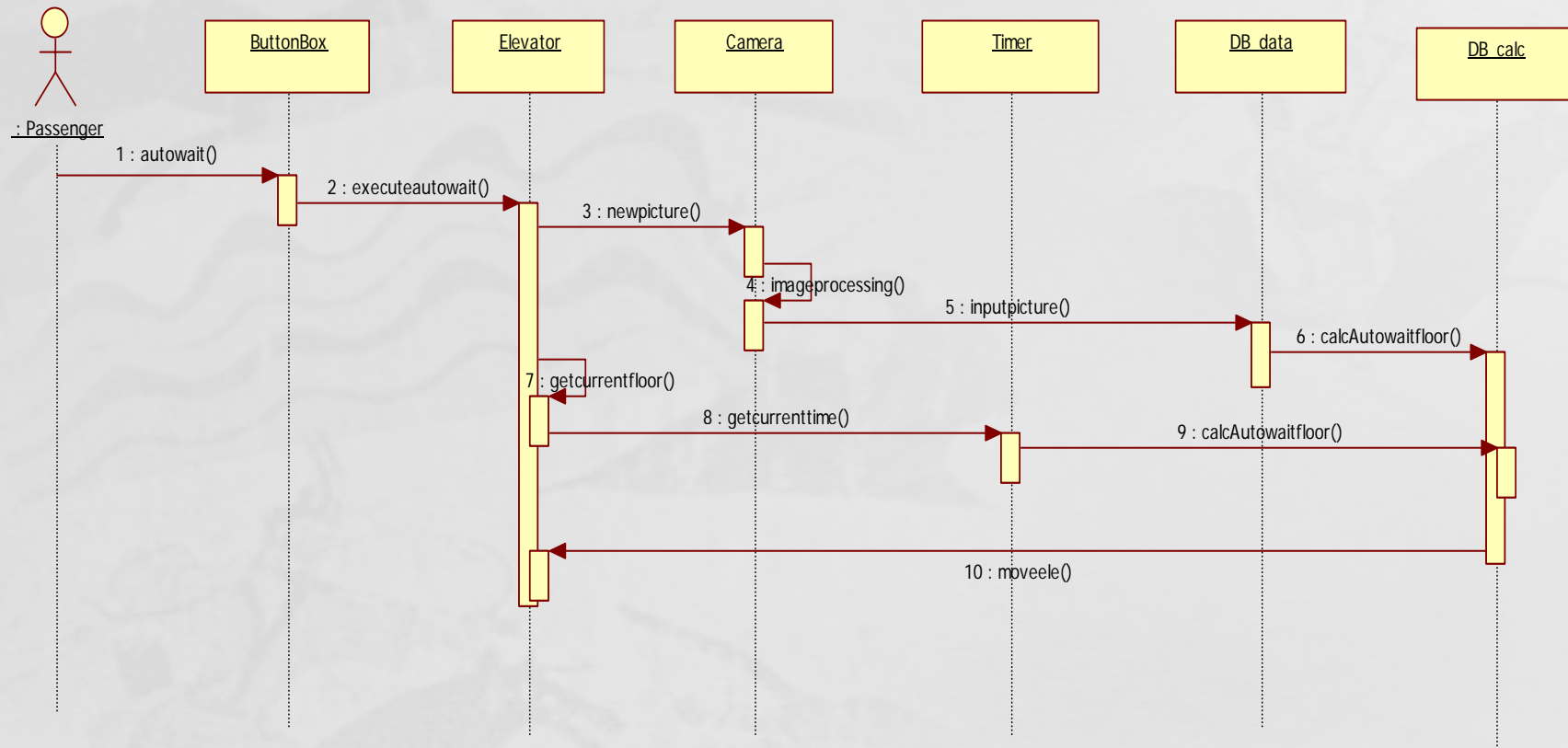
# Activity 2044. Define Interaction Diagrams

## 9. SafeDoor



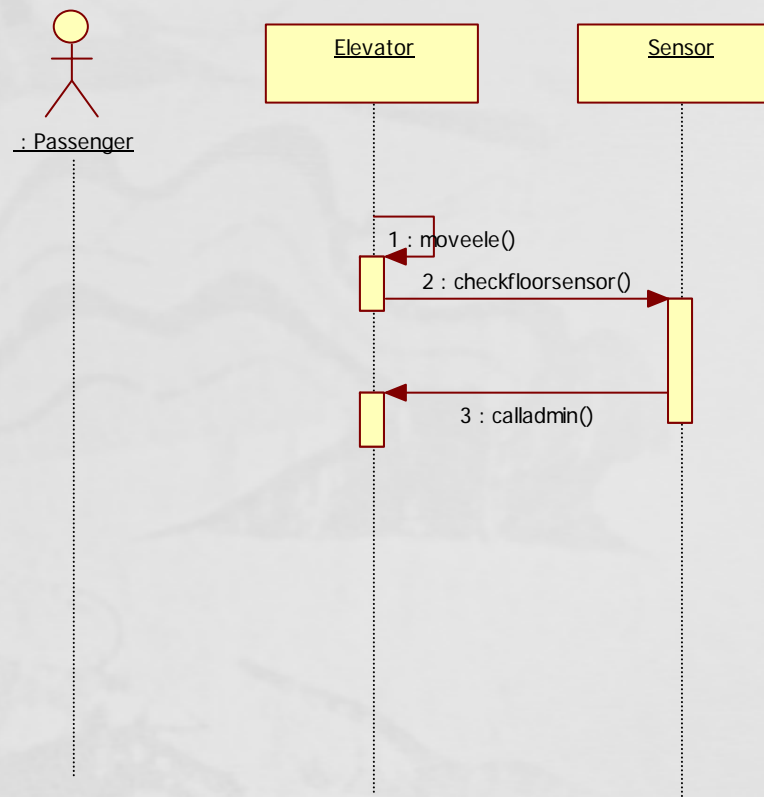
# Activity 2044. Define Interaction Diagrams

## 10. AutoWait



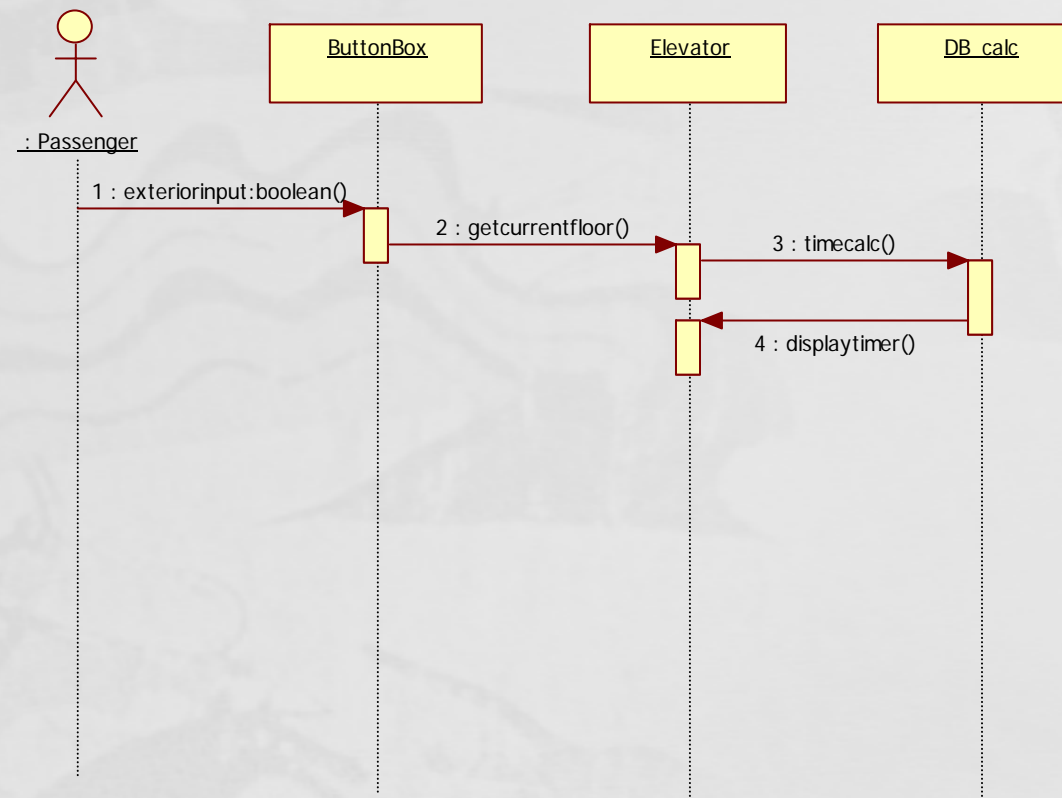
# Activity 2044. Define Interaction Diagrams

## 11. InformDanger



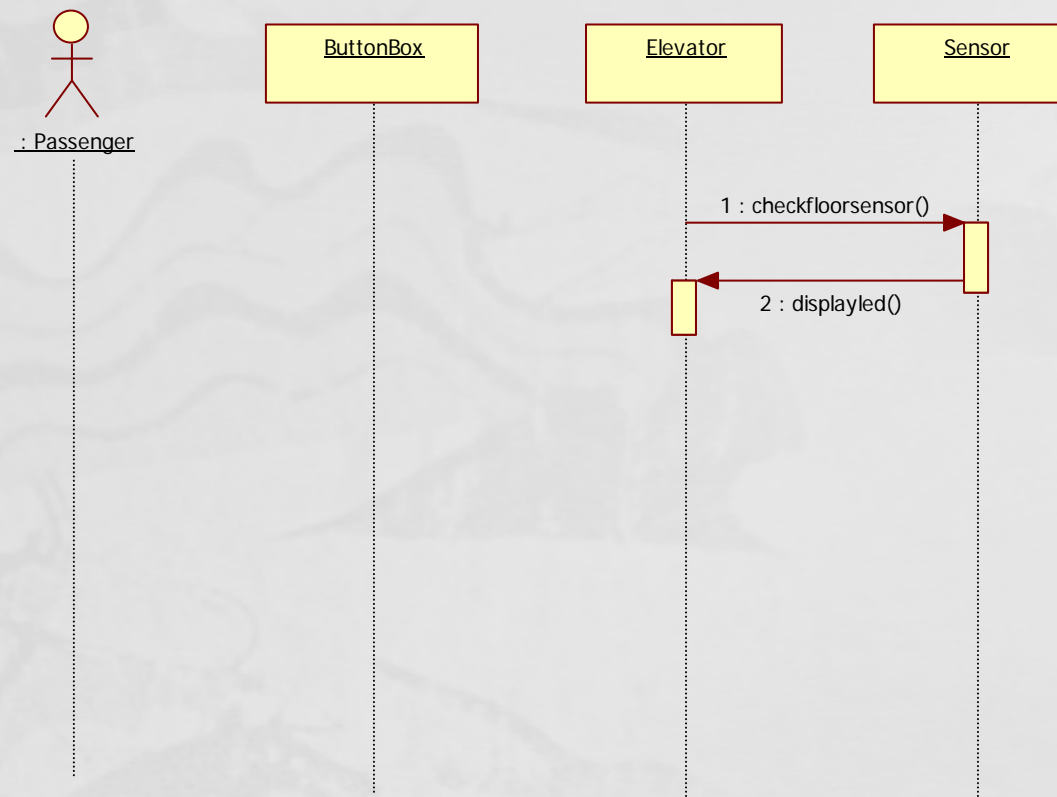
# Activity 2044. Define Interaction Diagrams

## 12. Open Door



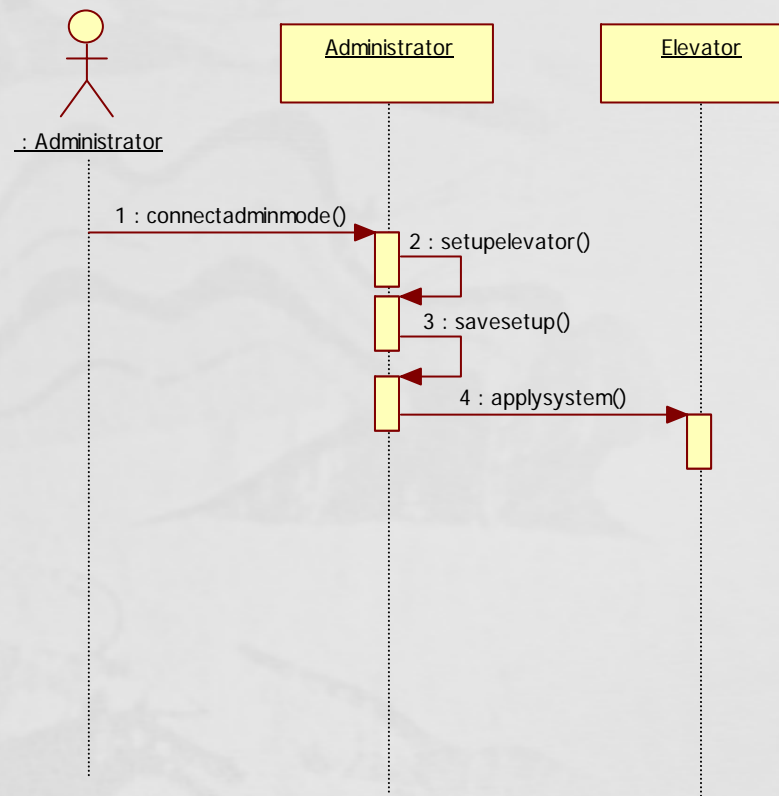
# Activity 2044. Define Interaction Diagrams

## 13. LocationDisplay



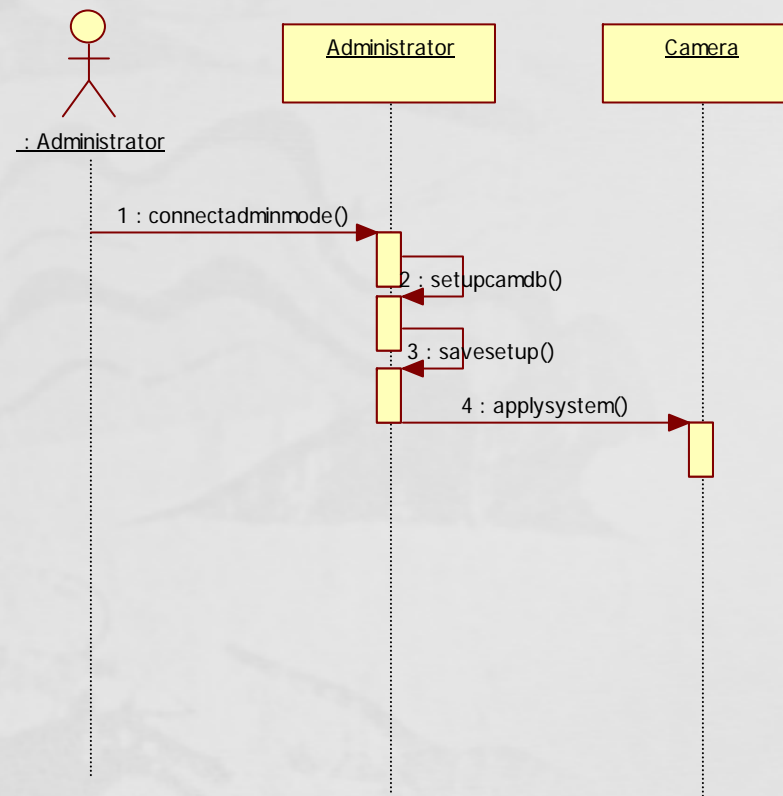
# Activity 2044. Define Interaction Diagrams

## 15. SetupElevator



# Activity 2044. Define Interaction Diagrams

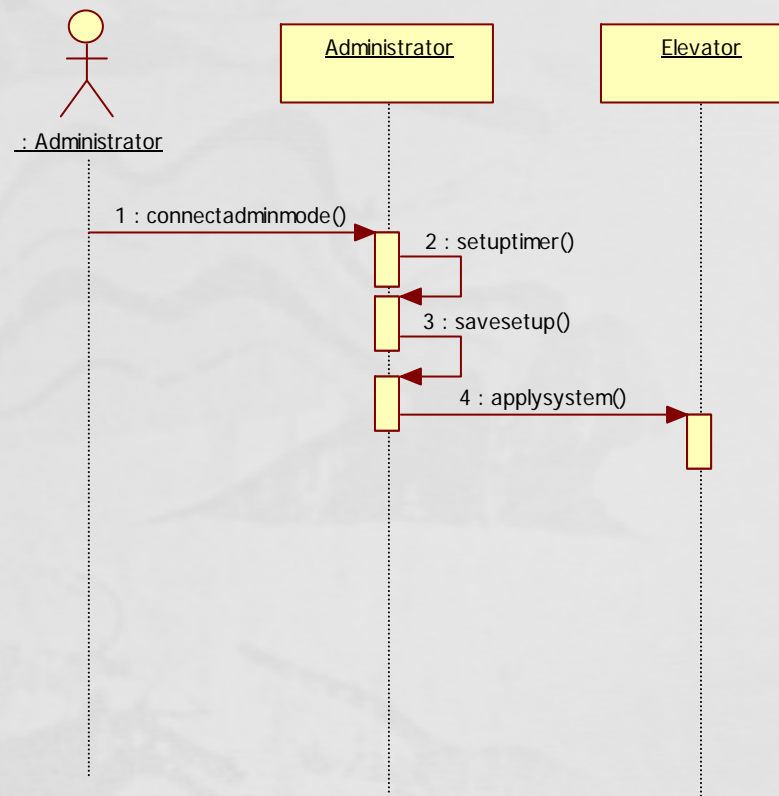
## 16. SetupCamDB





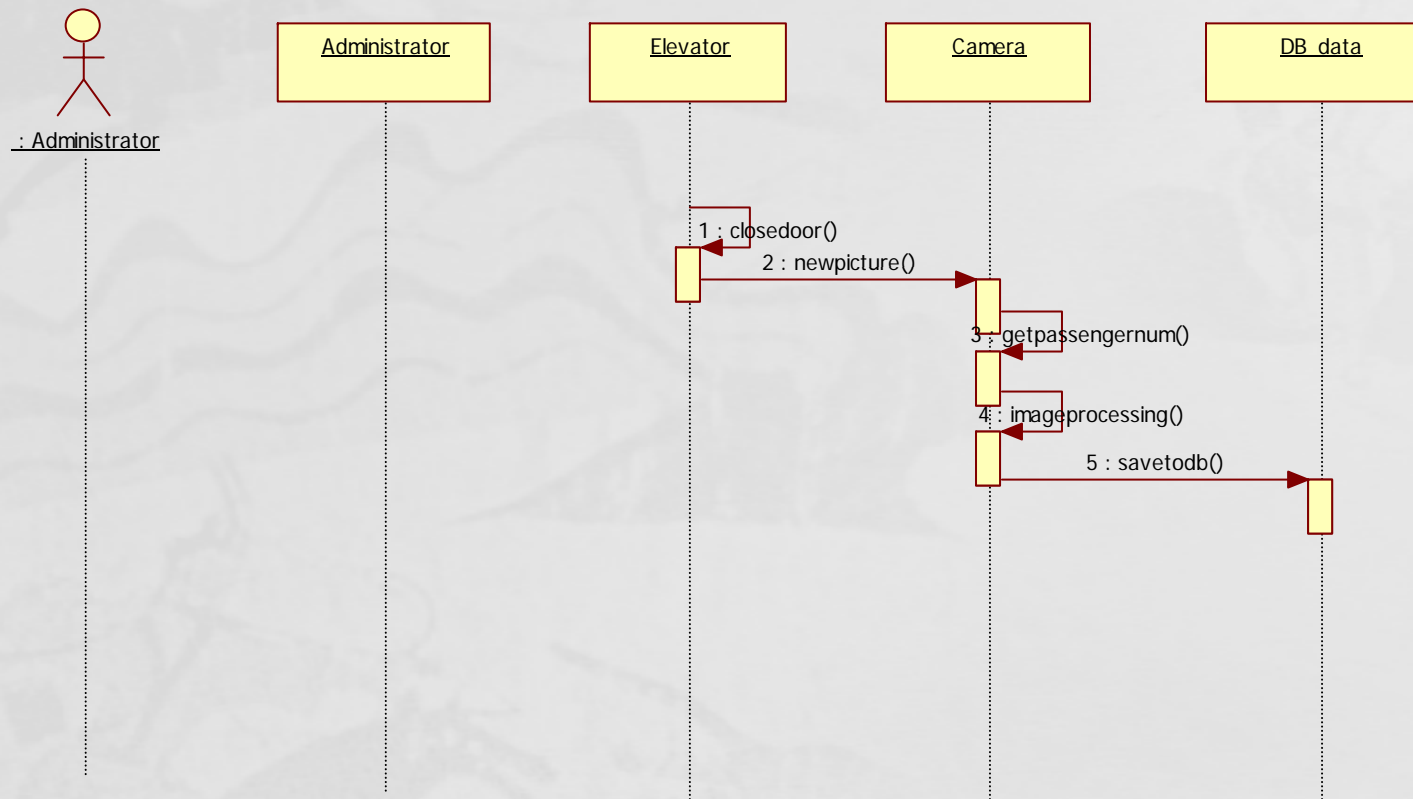
# Activity 2044. Define Interaction Diagrams

## 17. SetupTimer



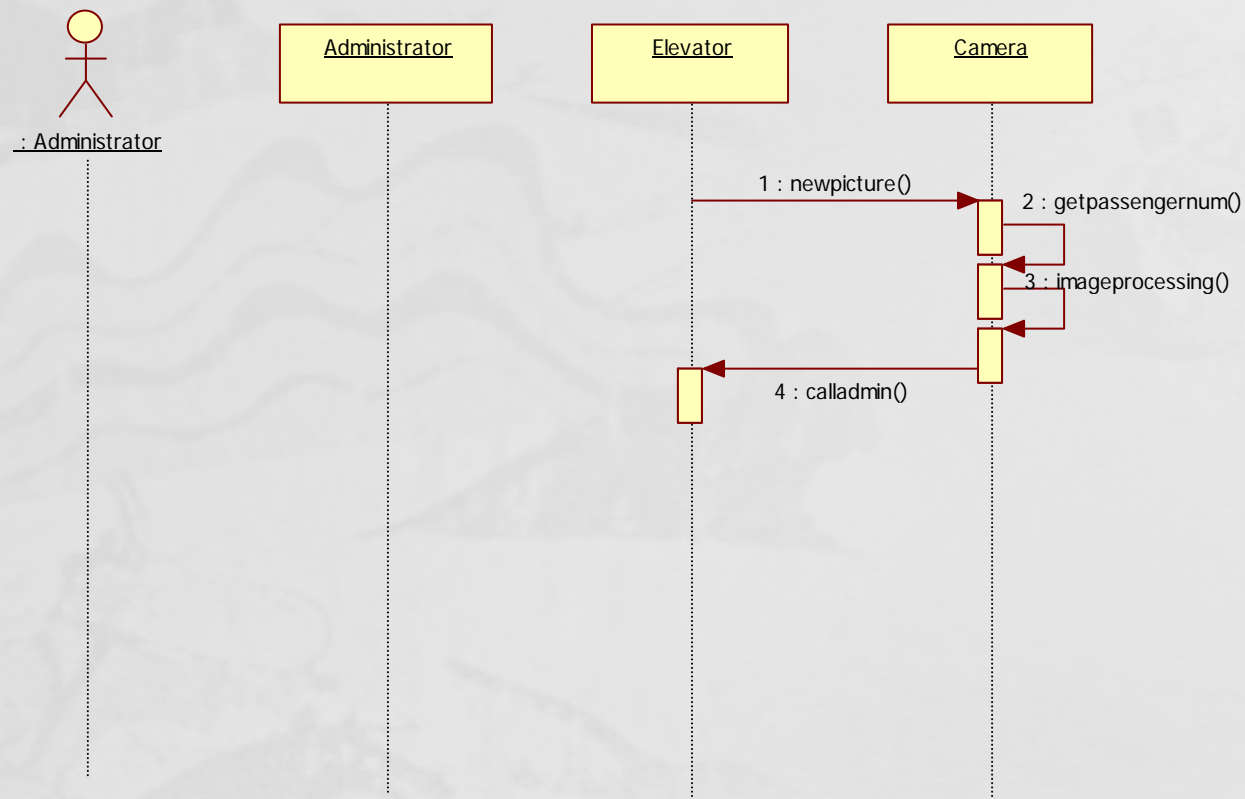
# Activity 2044. Define Interaction Diagrams

## 18. SearchGuest



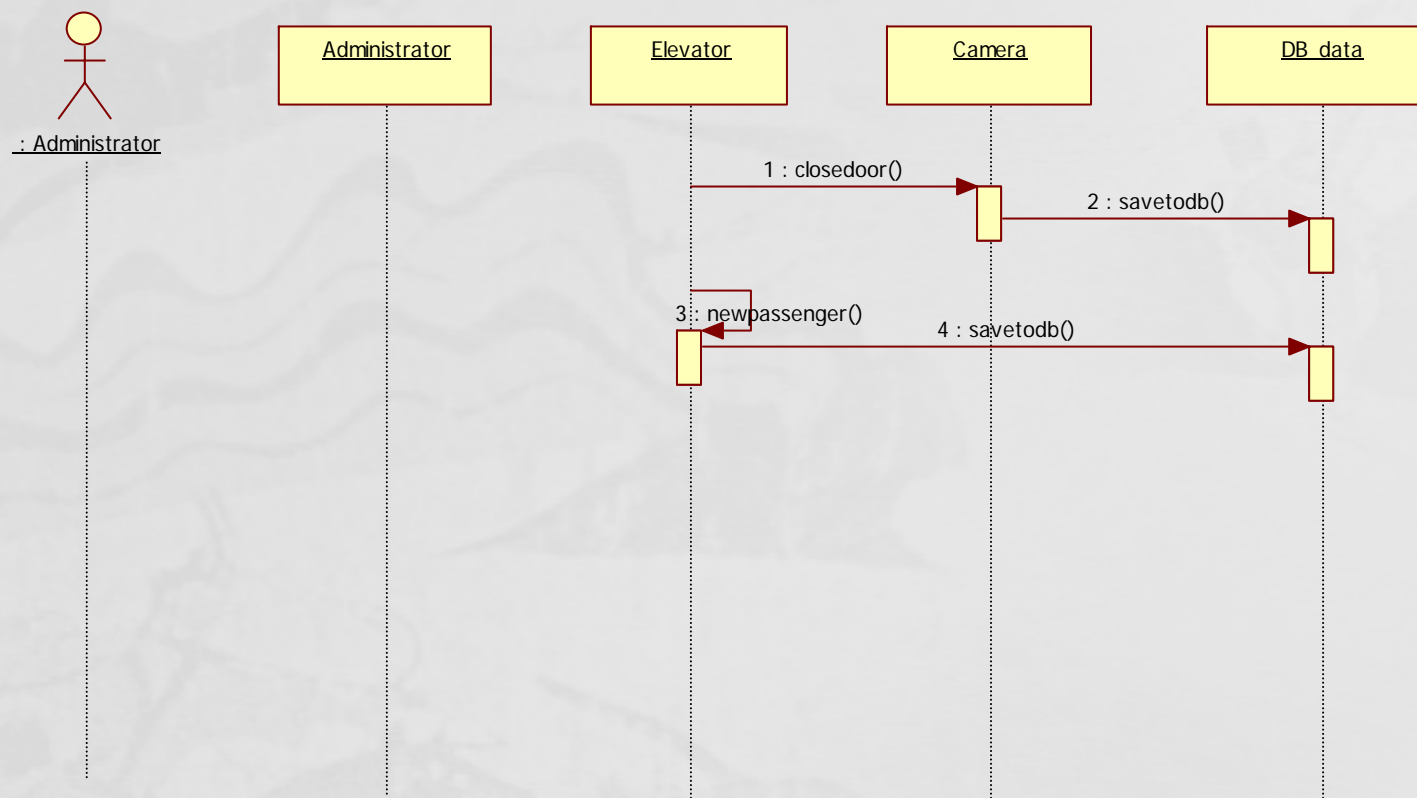
# Activity 2044. Define Interaction Diagrams

## 19. SearchDanger

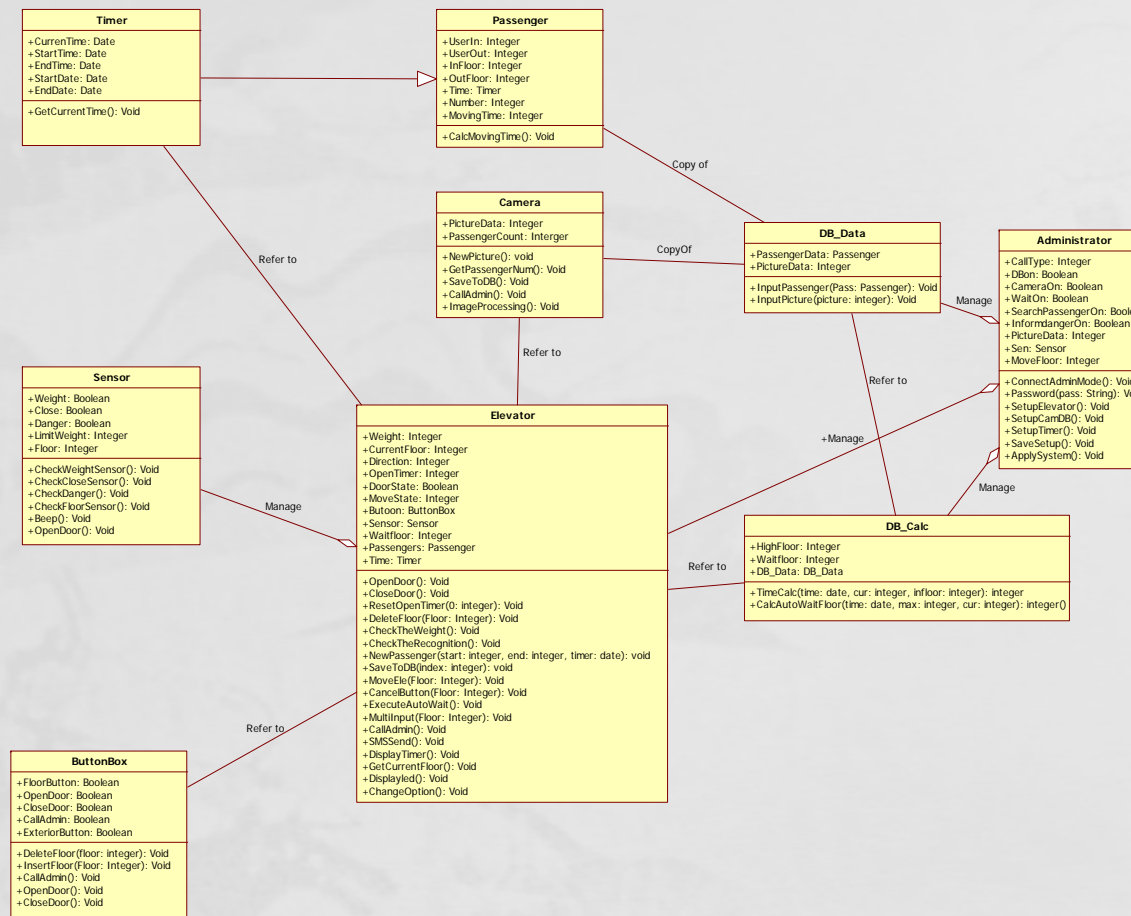


# Activity 2044. Define Interaction Diagrams

## 20. DatabaseInput



# Activity 2045. Define Design Class Diagram





# Activity 2046. Define Database Schema

## Picture Table

	File Path	Create Date
Picture1	String * 255	Date
Picture2	..	..
Picture3	..	..
Picture...	..	..

## Passenger Table

	Userin	Userout	Time	Infloor	Outfloor
Passenger1	Int	Int	date[5]	Int	Int
Passenger2	...	...	...	...	...
Passenger3	...	...	...	...	...
Passenger..	...	...	...	...	...

# Activity 2046. Define Database Schema

## Information Table

Max Floor	Int
Min Floor	Int
Setup1 On/Off	Boolean
Setup2 On/Off	Boolean
Setup3 On/Off	Boolean
Setup4 On/Off	Boolean
Operation Floor	String*
Operation Time	String*13
...	...
...	...
...	...
...	...