

# *State 2040. Design*

**Sweet heart**

The ultimate coffee machine you've dreamed of



# Agenda

1. What we've done in this stage?
2. A brief explanation on our system
3. Real Use-cases
4. User Interfaces
5. System architecture (deployment and package diagrams)
6. Interaction Diagrams
7. Class Diagrams
8. Database Schema

95 pages, will take around 20 min



# What we've done in this stage?

Expanded



Redefined



Wrote  
detail descriptions



# How does our system work?

## 1. At the very first time

**A remote controller**

- A remote controller which controls sweet heart . A mobile phone is usually used as a remote controller



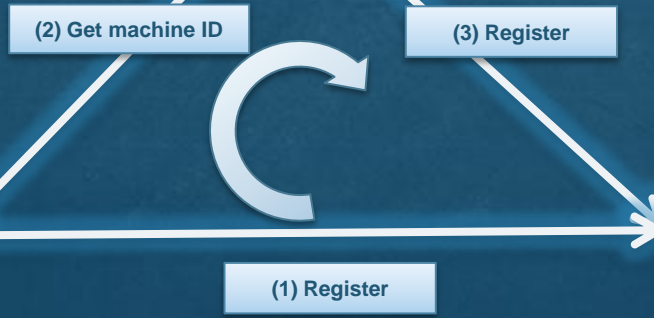
**The web server**

- The web server serves the way of communication between the sweet heart and the remote controller which is registered by the user



**Sweet heart**

- Our coffee machine



# How does our system work?

## 2. After the registration process

A remote controller

- A remote controller which controls sweet heart . A mobile phone is usually used as a remote controller



The web server

- The web server serves the way of communication between the sweet heart and the remote controller which is registered by the user



Sweet heart  
- Our coffee machine

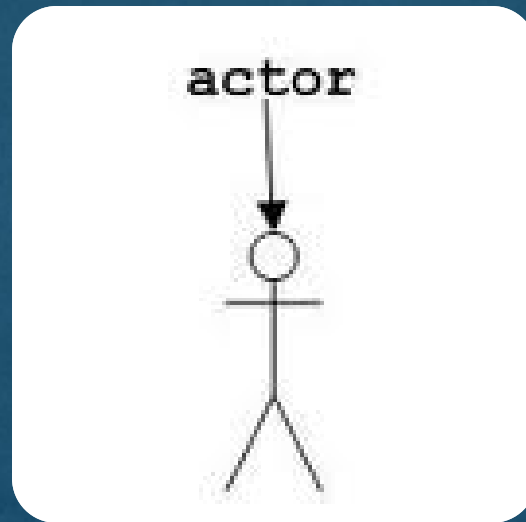


Send commands/  
Receive notifications

Store information



# *Real use-cases*



# 2141. Define Real Use Cases

## 1. Register a coffee machine

Element	Description
Use case	Register a coffee machine
Actor	None
Purpose	Build a list of coffee machines on the web server
Overview	Register identification information of product and remote controller on the web server to authorize the users when they try to access the machine.
Type	Primary and Real
Cross reference	Functions : R1.1.1, R1.1.2 Use Cases : "Register a coffee machine on the DB"
Pre-requisites	N/A
Typical courses of events	(A) Actor, (S) System 1. (S) A sweet heart checks whether the coffee machine is registered or not automatically when it is turned on 2. (S) If it is not registered, a sweet heart sends a request to register itself on the web server 3. (S) The web server registers the coffee machine on the database server by invoking "Register a coffee machine on DB" use-case 4. (S) Check if the registration has been done successfully and if there is an error, retry to register (2)
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If the sweet heart cannot receive the result in a minute, retry to register automatically.



# 2141. Define Real Use Cases

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Type	Primary and Real
Cross reference	Functions : R1.1.1, R1.1.2 Use Cases : "Register a coffee machine on the DB"
Pre-requisites	N/A
Typical courses of events	(A) Actor, (S) System 1. (S) A sweet heart checks whether the coffee machine is registered or not automatically when it is turned on 2. (S) If it is not registered, a sweet heart sends a request to register itself on the web server 3. (S) The web server registers the coffee machine on the database server by invoking "Register a coffee machine on DB" use-case 4. (S) Check if the registration has been done successfully and if there is an error, retry to register (2)
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If the sweet heart cannot receive the result in a minute, retry to register automatically.





# 2141. Define Real Use Cases

## 2. Register a coffee machine on the DB

Element	Description
Use case	Register a coffee machine on the DB
Actor	None
Purpose	Add a record to a database server
Overview	Add a record to a database server by a request from the web server
Type	Primary and Real
Cross reference	Functions : R1.1.2 Use Cases : -
Pre-requisites	N/A
Typical courses of events	(A) Actor, (S) System 1. (S) The web server registers the coffee machine on the database server
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 3. Register a remote controller

Element	Description
Use case	Register a remote controller
Actor	Owner
Purpose	Build a list of remote controllers and make relationships between sweet heart machines and remote controllers
Overview	Register controller with related coffee machine's information on the web server to authorize the users.
Type	Primary and Real
Cross reference	Functions : R1.2.1, R1.2.2, R1.2.3 Use Cases : "Register a remote controller on the DB", "Request a machine identification number"
Pre-requisites	The remote controller should be turned on before
Typical courses of events	(A) Actor, (S) System 1. (S) A remote controller checks whether it is registered on the web server or not when the remote controller is turned on 2. (S) If it is not registered, it shows a page to the user to get an identification number of related sweet heart 3. (S) The remote controller requests an identification number from the sweet heart by invoking "Request machine identification number" use-case 4. (A) An owner confirms to send a request to register 5. (S) The remote controller sends a registration message to the web server 6. (S) The web server registers the remote controller on the database server by invoking "Register a remote controller on DB" use-case 7. (S) The remote controller shows the result of above processes on the screen
Alternative courses of events	N/A
Exceptional courses of events	Line 6. If the web server fails to register it, indicate an error.



# 2141. Define Real Use Cases

## 4. Register a remote controller on the DB

Element	Description
Use case	Register a remote controller on the DB
Actor	None
Purpose	Add a record to a database server
Overview	Add a record to a database server by a request from the web server
Type	Primary and Real
Cross reference	Functions : R1.2.2 Use Cases : -
Pre-requisites	The remote controller should be turned on before
Typical courses of events	(A) Actor, (S) System 1. (S) The web server registers the remote controller on the database server
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 5. Request a machine identification number

Element	Description
Use case	Request a machine identification number
Actor	None
Purpose	Make a relationship between a remote controller and sweet heart
Overview	Receive machine identification number from sweet heart to register a relationship between sweet heart and remote controllers on the web server.
Type	Primary and Real
Cross reference	Functions : R1.2.3 Use Cases : -
Pre-requisites	The remote controller should be turned on before. During the execution of "Register a remote controller" use-case, this use-case is invoked by one of the processes of "Register a remote controller" use-case.
Typical courses of events	(A) Actor, (S) System 1. (S) A remote controller sends a message to request an identification number of the sweet heart 2. (S) The remote controller shows received identification number on the screen.
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 6. Change Mode

Element	Description
Use case	Change Mode
Actor	Owner
Purpose	Change mode on the remote controller to change options on the system
Overview	Allow users to change modes such as “Coffee Ordering mode”, “Personal Information mode” and “Configuration Mode”
Type	Primary and Real
Cross reference	Functions : R1.3, R1.2.1, R1.4.1, R1.4.3, R1.4.5, R1.5.2 Use Cases : “Register a remote controller”, “Save personal information”, “Update personal information”, “Reset saved records”, “Order a cup of coffee”
Pre-requisites	The controller should be registered on the web server before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner selects mode on the remote controller 2. (S) A remote controller changes its mode to requested by the user and show the result
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 7. Save personal information

Element	Description
Use case	Save personal information
Actor	Owner
Purpose	Save information for making a recommendation on coffee
Overview	Save personal information including his or her preferences such as preferred coffee beans, sugar portion in the coffee on the web server.
Type	Primary and Real
Cross reference	Functions : R1.4.1, R1.4.2 Use Cases : "Save personal information on the DB"
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Personal Information Mode" before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner inputs personal information on the remote controller 2. (S) A remote controller sends information to the web server 3. (S) The web server saves the personal information 4. (S) A remote controller shows the result of above processes on the screen.
Alternative courses of events	N/A
Exceptional courses of events	Line 3. If the web server fails to save the information, indicate an error.



# 2141. Define Real Use Cases

## 8. Save personal information on the DB

Element	Description
Use case	Save personal information on the DB
Actor	None
Purpose	Save information for making a recommendation on coffee
Overview	Save personal information including his or her preferences such as preferred coffee beans, sugar portion in the coffee on the web server.
Type	Primary and Real
Cross reference	Functions : R1.4.2 Use Cases : -
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Personal Information Mode" before.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server saves the personal information on the database
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 9. Update personal information

Element	Description
Use case	Update personal information
Actor	Owner
Purpose	Update information for making a recommendation on coffee
Overview	Update personal information including his or her information
Type	Primary and Real
Cross reference	Functions : R1.4.3, R1.4.4 Use Cases : "Update personal information on the DB"
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Personal Information Mode" before.
Typical courses of events	(A) Actor, (S) System 1. (A) An actor inputs personal information on the remote controller 2. (S) A remote controller sends information to the web server 3. (S) The web server updates the personal information 4. (S) A remote controller shows the result of above processes on the screen.
Alternative courses of events	N/A
Exceptional courses of events	Line 3. If the web server fails to save the information, indicate an error.





# 2141. Define Real Use Cases

## 10. Update personal information on the DB

Element	Description
Use case	Update personal information on the DB
Actor	None
Purpose	Update information for making a recommendation on coffee
Overview	Update personal information including his or her information
Type	Primary and Real
Cross reference	Functions : R1.4.4 Use Cases : -
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Personal Information Mode" before.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server updates the personal information on the database
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 11. Reset saved records

Element	Description
Use case	Reset saved records
Actor	Owner
Purpose	Initialize learning system by deleting all previously saved user's decisions
Overview	Delete all and initialize the saved user's past decision on the database.
Type	Primary and Real
Cross reference	Functions : R1.4.5, R1.4.6 Use Cases : "Reset saved records on the DB"
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Mode Change Screen" before.
Typical courses of events	(A) Actor, (S) System 1. (A) An actor requests to reset saved records from the remote controller 2. (S) A remote controller sends a request to reset all saved records to the web server 3. (S) The web server deletes all saved records 4. (S) A remote controller shows received result on the screen.
Alternative courses of events	N/A
Exceptional courses of events	Line 3. If the web server fails to reset all saved records, indicate an error.



# 2141. Define Real Use Cases

## 12. Reset saved records on the DB

Element	Description
Use case	Reset saved records on the DB
Actor	None
Purpose	Delete all saved records related to users' decisions on the database
Overview	Delete all saved records related to users' decisions on the database to initialize the system
Type	Primary and Real
Cross reference	Functions : R1.4.6 Use Cases : -
Pre-requisites	The controller should be registered on the web server and the current mode on the remote controller should be changed to "Mode Change Screen" before.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server deletes all saved records related to users' decisions on the database
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 13. Choose a cup of coffee to recommend

Element	Description
Use case	Choose a cup of coffee to recommend
Actor	None
Purpose	Determine what coffee to recommend
Overview	Make a decision on the recommended coffee based on saved owner's preference, weather, bio-rhythm, special day.
Type	Primary and Real
Cross reference	Functions : R1.5.1 Use Cases : -
Pre-requisites	All registration processes should be done and the current mode on the remote controller should be changed to "Coffee Ordering Mode" before. After that events, the remote controller invokes this use-case.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server gets personal information from the database server 2. (S) The web server queries various information such as including today's weather from the Internet 3. (S) The web server chooses a cup of coffee to recommend based on various factors such as today's weather, the user's bio-rhythm and previous decisions. 4. (S) The web server saves chosen recommended coffee on the web server in order to send it to the remote controller that requests the recommended coffee
Alternative courses of events	N/A
Exceptional courses of events	Line 2,3,4. If the web server has an error during choosing the coffee to recommend, indicate an error.



# 2141. Define Real Use Cases

## 14. Order a cup of coffee

Element	Description
Use case	Order a cup of coffee
Actor	Owner
Purpose	Order a cup of coffee regarding users' taste
Overview	Give an user to various options such as amount of water and size
Type	Primary and Real
Cross reference	Functions : R1.5.2, R1.5.3 Use Cases : "Confirm ordered coffee"
Pre-requisites	All registration processes should be done and the current mode on the remote controller should be changed to "Coffee Ordering Mode" before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner chooses a cup of coffee among the menus that include recommended coffee chosen by use-case number 8 with options about amount of water and size on the remote controller 2. (S) The remote controller checks ingredients on the sweet heart based on the information received at the use-case "Show remained materials" 3. (S) The remote controller saves all information and moves on to the "Confirm a cup of coffee"
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If there is insufficient ingredient, indicate an error.



# 2141. Define Real Use Cases

## 15. Confirm ordered coffee

Element	Description
Use case	Confirm ordered coffee
Actor	Owner
Purpose	Make sure users' selection before start to make a cup of coffee
Overview	Confirm before making a cup of coffee based on the selected options.
Type	Primary and Real
Cross reference	Functions : R1.5.3, R1.5.4, R1.5.5 Use Cases : "Confirm ordered coffee on the WS", "Confirm ordered coffee on the SH"
Pre-requisites	All registration processes should be done and "Order a cup of coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner confirms and requests to make a cup of coffee on the remote controller 2. (S) The remote controller sends information of the ordered coffee to the web server to invoke "Confirm ordered coffee on the WS" use-case 3. (S) The remote controller sends a request to the sweet heart to make a cup of coffee to invoke "Confirm ordered coffee on the SH" use-case
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 16. Confirm ordered coffee on the WS

Element	Description
Use case	Confirm ordered coffee on the WS
Actor	None
Purpose	Save ordered coffee on the database
Overview	Save ordered coffee on the database after the user confirmed ordered coffee
Type	Primary and Real
Cross reference	Functions : R1.5.4, R1.13 Use Cases : "Save user's decision"
Pre-requisites	All registration processes should be done and "Confirm a cup of coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server invokes "Save user's decision"
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 17. Confirm ordered coffee on the SH

Element	Description
Use case	Confirm ordered coffee on the SH
Actor	None
Purpose	Start to make a cup of coffee
Overview	Start to make a cup of coffee after the user confirmed
Type	Primary and Real
Cross reference	Functions : R1.5.5, R1.6.1, R1.7 Use Cases : “Notify progress”, “Make a cup of coffee”
Pre-requisites	All registration processes should be done and “Confirm a cup of coffee” use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart invokes “Notify progress” use-case in order to get progress during the making a cup of coffee 2. (S) The sweet heart invokes “Make a cup of coffee” use-case.
Alternative courses of events	N/A
Exceptional courses of events	N/A





# 2141. Define Real Use Cases

## 18. Notify progress

Element	Description
Use case	Notify progress
Actor	None
Purpose	Notify the progress during making a cup of coffee
Overview	Send notification messages to the remote controller to show information of progress to the user
Type	Primary and Real
Cross reference	Functions : R1.6.1, R1.6.2 Use Cases : "Update screen by a notification message"
Pre-requisites	All registration processes should be done and "Confirm a cup of coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart checks grind machine's status 2. (S) The sweet heart checks boiler's status 3. (S) The sweet heart checks mixer's status 4. (S) The sweet heart checks dropper's status 5. (S) If one of the machines changes its status, the sweet heart sends a message to the remote controller to invoke "Update screen by a notification message" use-case
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 19. Update screen by a notification message

Element	Description
Use case	Update screen by a notification message
Actor	None
Purpose	Update screen on the remote controller by a notification message
Overview	Keep up-to-date information on the remote controller by updating information when the remote controller receives notification messages from the sweet heart
Type	Primary and Real
Cross reference	Functions : R1.6.2 Use Cases : -
Pre-requisites	All registration processes should be done and "Notify progress" use-case should be executed before. When a notification message from the sweet heart has been arrived, this use-case is invoked.
Typical courses of events	(A) Actor, (S) System 1. (S) The remote controller updates its screen according to the received information
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 20. Make a cup of coffee

Element	Description
Use case	Make a cup of coffee
Actor	None
Purpose	Sends commands to the sweet heard in order to make a cup of coffee
Overview	<p>This use cases includes lots of trivial operations on the machine in order to make a cup of coffee. During making a cup of coffee, the sweet heart and the remote controller both send and receive status information asynchronously. This use-cases contains some machines, grind machine, boiler machine, mixer machine, drop machine, as external users in order to make a cup of coffee physically. The detailed descriptions of the machines are not stated in here since the function of machines are obviously presented by their names.</p> <p>* We assume that the grind machine will make all ingredients be ready which means the grind machine plays a role to place all ingredients properly without additional commands. It does that automatically.</p>
Type	Primary and Real
Cross reference	Functions : R1.7 Use Cases : -
Pre-requisites	All registration processes should be done and "Confirm ordered coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System <ol style="list-style-type: none"><li>1. (S) The sweet heart commands to the grind machine to grind beans</li><li>2. (S) The sweet heart commands to the boiler machine to boil water</li><li>3. (S) The sweet heart commands to the mixer machine to mix ingredients based on given options</li><li>4. (S) The sweet heart waits until the above processes are finished</li><li>5. (S) The sweet heart commands to the drop machine to drop coffee</li></ol>
Alternative courses of events	N/A
Exceptional courses of events	Line 1,2,3,4,5. If the sweet heart has an error during choosing the coffee to recommend, indicate an error on the screen of the remote controller.



# 2141. Define Real Use Cases

## 21. Cancel ordered coffee

Element	Description
Use case	Cancel ordered coffee
Actor	Owner
Purpose	Allow an user to cancel ordered coffee even if it is in process of making.
Overview	Cancel ordered coffee
Type	Primary and Real
Cross reference	Functions : R1.8.1, R1.8.2 Use Cases : “Abort work and initialize machines”
Pre-requisites	All registration processes should be done and “Confirm ordered coffee” use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner requests to cancel ordered coffee on the remote controller 2. (S) The remote controller sends a request to the sweet heart to cancel ordered coffee by invoking “Abort work and initialize machines” use-case.
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 22. Abort work and initialize machines

Element	Description
Use case	Abort work and initialize machines
Actor	None
Purpose	Abort work and initialize machines to ready for another tasks
Overview	Abort work and initialize machines to ready for another tasks such as having a new order.
Type	Primary and Real
Cross reference	Functions : R1.8.2 Use Cases : -
Pre-requisites	All registration processes should be done and "Cancel ordered coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart stops and initializes the grind machine 2. (S) The sweet heart stops and initializes the boiler 3. (S) The sweet heart stops and initializes the mixer 4. (S) The sweet heart stops and initializes the dropper
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 23. Gather information about remained materials

Element	Description
Use case	Gather information about remained materials
Actor	None
Purpose	Gather information about remained materials to inform it to the remote controller
Overview	Gather information about ingredients and send it to the remote controller to let the user know how much ingredients are remained
Type	Primary and Real
Cross reference	Functions : R1.9.1, R1.9.2 Use Cases : "Update remained materials information"
Pre-requisites	All registration processes should be done before. The remote controller invokes this use-case every single time it wants to update the information about remained materials.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart checks how much beans are remained 2. (S) The sweet heart checks how much cream is remained 3. (S) The sweet heart checks how much sugar is remained 4. (S) The sweet heart returns all gathered information to the remote controller to invoke "Update remained materials information"
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 24. Update remained materials information

Element	Description
Use case	Update remained materials information
Actor	None
Purpose	Update remained materials information on the remote controller
Overview	To keep up-to-date information about remained materials, this use-case updates the information on the screen when it receives a message about remained materials from the sweet heart
Type	Primary and Real
Cross reference	Functions : R1.9.2 Use Cases : -
Pre-requisites	All registration processes should be done before. This use-case is automatically invoked by the remote controller when it receives a message which contains information about remained materials.
Typical courses of events	(A) Actor, (S) System 1. (S) The remote controller shows the information about remained materials
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 25. Choose a music to recommend

Element	Description
Use case	Choose a music to recommend
Actor	None
Purpose	Determine what music to recommend
Overview	Make a decision on the recommended music based on saved owner's preference, weather, bio-rhythm, special day and recently ordered coffee.
Type	Primary and Real
Cross reference	Functions : R1.10.1, R1.10.2 Use Cases : "Select music"
Pre-requisites	All registration processes should be done and "Confirm ordered coffee" use-case should be executed before. After that events, the remote controller invokes this use-case.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server gets personal information including recently ordered coffee from the database server 2. (S) The web server queries various information such as including today's weather from the Internet 3. (S) The web server chooses a music to recommend based on various factors such as today's weather, the user's bio-rhythm and previous decisions. 4. (S) The web server saves chosen recommended music on the web server in order to send it to the remote controller that requests the recommended music
Alternative courses of events	N/A
Exceptional courses of events	Line 2,3,4,. If the web server has an error during choosing the coffee to recommend, indicate an error.





# 2141. Define Real Use Cases

## 26. Select music

Element	Description
Element	Description
Use case	Select music
Actor	Owner
Purpose	Give options on list of music to users
Overview	Allow an user to select the music in order to play. Lists are shown and aligned by genres and generations.
Type	Primary and Real
Cross reference	Functions : R1.10.2, R1.10.3, R1.10.4, R1.10.5, R1.11.1, R1.12.1 Use Cases : "Request music lists", "Update music lists", "Play music on SH", "Stop music", "Change volume"
Pre-requisites	All registration processes should be done and "Confirm ordered coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (A) An actor selects a music the person would like to listen among the music list that include recommended music 2. (S) When the user selecting a music, if music lists are not exist on the remote controller, the remote controller requests the music lists to the web server by invoking "Request music lists" 3. (S) If the remote controller has requested the music lists to the web server, the web server returns music lists to requested remote controller by invoking "Update music lists" 4. (S) The remote controller sends a message to request transfer selected music file to the sweet heart to play 5. (S) The web server sends a selected music file to the sweet heart to play a music automatically on the sweet heart after this use-case is executed
Alternative courses of events	N/A



# 2141. Define Real Use Cases

## 27. Request music lists

Element	Description
Use case	Request music lists
Actor	None
Purpose	Update music lists which is obsolete or not existed on the remote controller
Overview	Send a request message to the web server to get up-to-date music lists from the web server
Type	Primary and Real
Cross reference	Functions : R1.10.3, R1.10.4 Use Cases : "Update music lists"
Pre-requisites	All registration processes should be done and "Confirm ordered coffee" use-case should be executed before. Also, the remote controller does not have valid music lists.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server gathers music lists based on its local files 2. (S) The web server stores gathered music lists temporary to send it when the remote controller requests "Update music lists"
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 28. Update music lists

Element	Description
Use case	Update music lists
Actor	None
Purpose	Update music lists which is obsolete or not existed on the remote controller
Overview	Send up-to-date music lists to the web server to give up-to-date music lists to the web server
Type	Primary and Real
Cross reference	Functions : R1.10.4 Use Cases : -
Pre-requisites	All registration processes should be done and "Request music lists" use-case should be executed before. When messages from "Request music lists" arrived, this use-case will be automatically invoked.
Typical courses of events	(A) Actor, (S) System 1. (S) The remote controller updates music lists 2. (S) The remote controller shows the lists on the screen
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 29. Play music on SH

Element	Description
Use case	Play music on SH
Actor	None
Purpose	Play a music automatically after the sweet heart received a music file
Overview	Play a music automatically after the sweet heart received a music file selected by the user
Type	Primary and Real
Cross reference	Functions : R1.10.5 Use Cases : -
Pre-requisites	All registration processes should be done and "Select music" use-case should be executed before. When the sweet heart receives a music file from the web server, this use-case will be automatically invoked.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart plays received music
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 30. Stop music

Element	Description
Use case	Stop music
Actor	Owner
Purpose	Allow an option to stop the music which is playing now
Overview	Stop the music which is playing now
Type	Primary and Real
Cross reference	Functions : R1.11.1, R1.11.2 Use Cases : "Stop music on SH"
Pre-requisites	All registration processes should be done and "Select music" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner requests to stop the music currently playing 2. (S) The remote controller sends a request to the sweet heart to stop the music by invoking "Stop music on SH" use-case 3. (S) The remote controller updates its user interface on the screen
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 31. Stop music on SH

Element	Description
Use case	Stop music on SH
Actor	None
Purpose	Stop the music on the sweet heart
Overview	Stop the music which is playing now on the sweet heart
Type	Primary and Real
Cross reference	Functions : R1.11.2 Use Cases : -
Pre-requisites	All registration processes should be done and "Select music" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart stop the music after receiving the stop message from a remote controller
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 32. Change volume

Element	Description
Use case	Change volume
Actor	Owner
Purpose	Allow an option to change volume while it is playing a music
Overview	Change the system volume
Type	Primary and Real
Cross reference	Functions : R1.12.1, R1.12.2 Use Cases : "Change volume on SH"
Pre-requisites	All registration processes should be done and "Select music" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (A) An owner adjusts volume by using a remote controller 2. (S) The remote controller sends a request to the sweet heart to adjust volume by invoking "Change volume on SH"
Alternative courses of events	N/A
Exceptional courses of events	N/A



# 2141. Define Real Use Cases

## 33. Change volume on SH

Element	Description
Use case	Change volume on SH
Actor	None
Purpose	Change the system volume on the sweet heart
Overview	Change the system volume on the sweet heart
Type	Primary and Real
Cross reference	Functions : R1.12.2 Use Cases : -
Pre-requisites	All registration processes should be done and “Change volume” use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The sweet heart changes the volume
Alternative courses of events	N/A
Exceptional courses of events	N/A





# 2141. Define Real Use Cases

## 34. Save user's decision

Element	Description
Use case	Save user's decision
Actor	None
Purpose	Save user's decision on the database to use it later to determine recommend
Overview	This use case saves decisions from the Owner to the database on the web server. The following information will be saved. Selected coffee, size of coffee, amount of water in the coffee and information of chosen music.
Type	Primary and Real
Cross reference	Functions : R1.13, R1.5.1, R1.10.1 Use Cases : "Choose a cup of coffee to recommend", "Choose a music to recommend"
Pre-requisites	All registration processes should be done and "Confirm coffee" use-case should be executed before.
Typical courses of events	(A) Actor, (S) System 1. (S) The web server saves user's decision on the database server 2. (S) If the error occurs, save it to the web server as a log file, to review it later.
Alternative courses of events	N/A
Exceptional courses of events	N/A

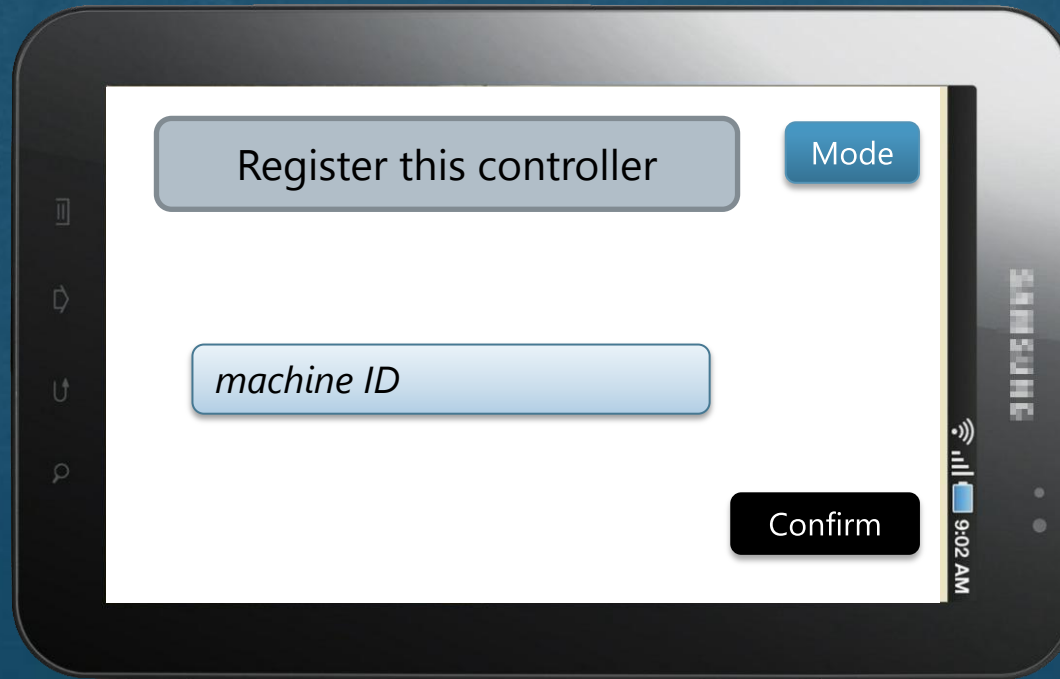


# *User interfaces*



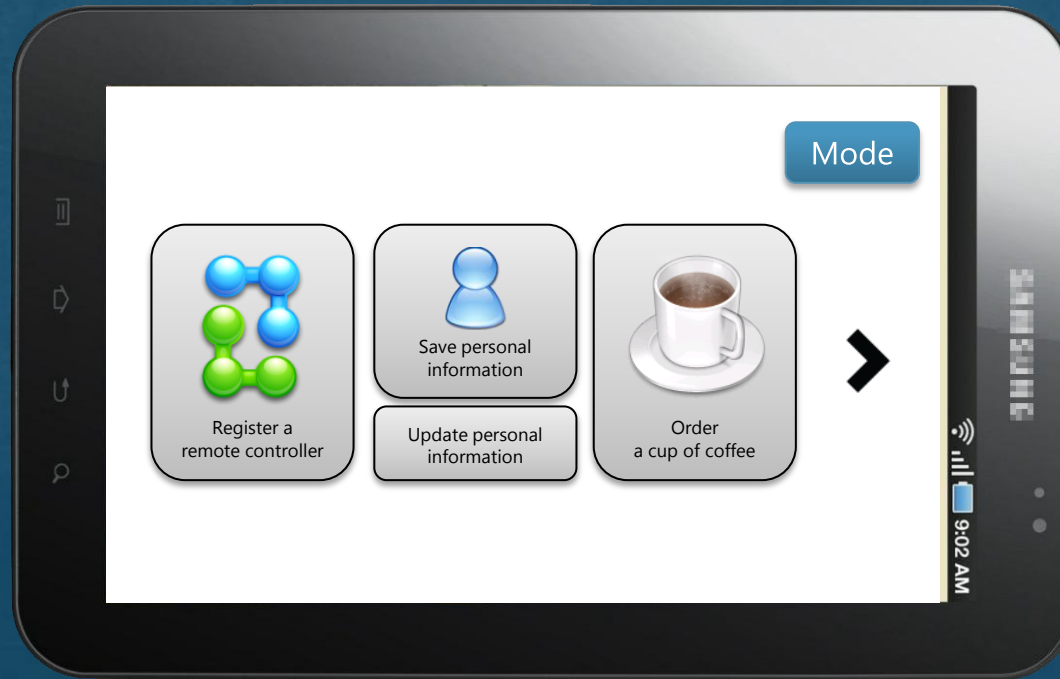
# 2142. GUI

- Register a remote controller



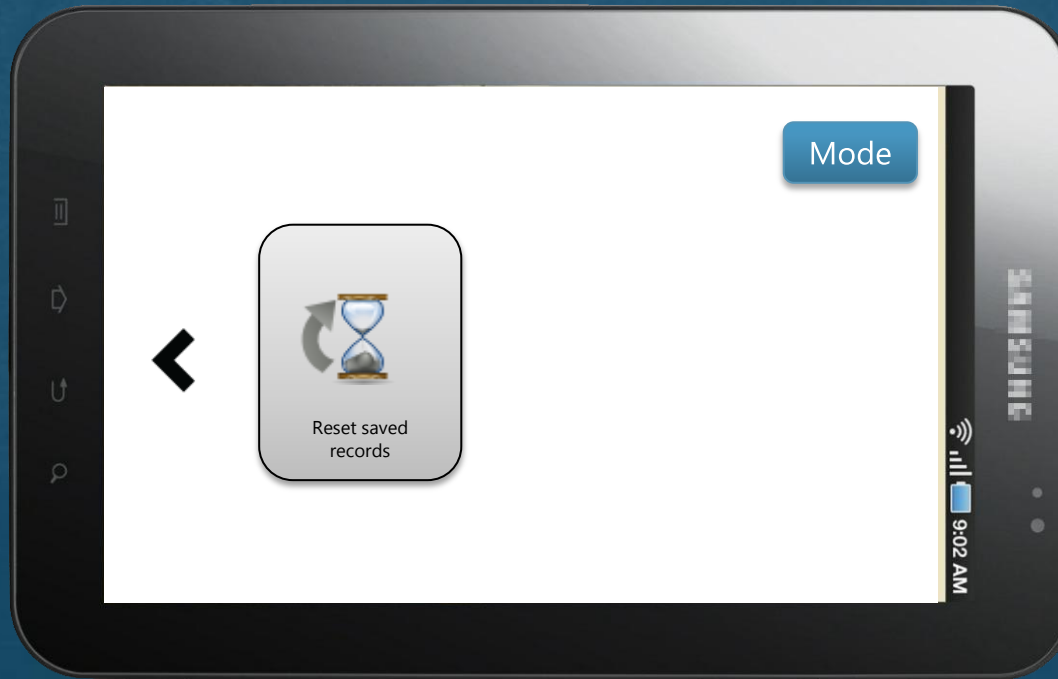
# 2142. GUI

- Change mode (1/2)



# 2142. GUI

- Change mode (2/2)



# 2142. GUI

- Save personal information



# 2142. GUI

- Update personal information



# 2142. GUI

- Order a cup of coffee





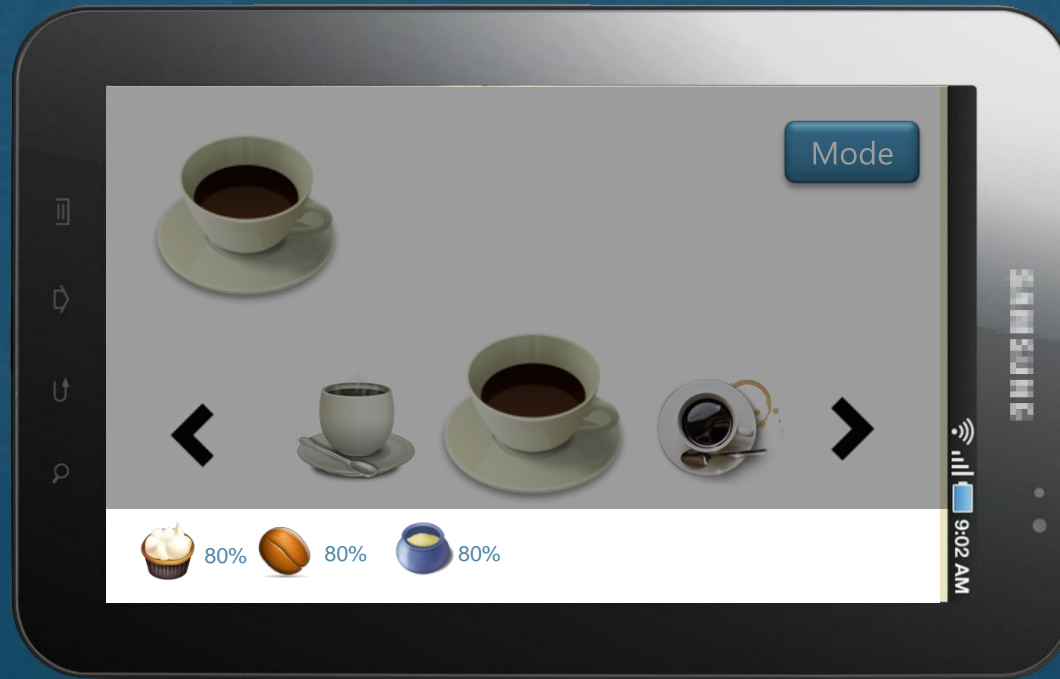
# 2142. GUI

- Confirm a cup of coffee



# 2142. GUI

- Update remained materials information



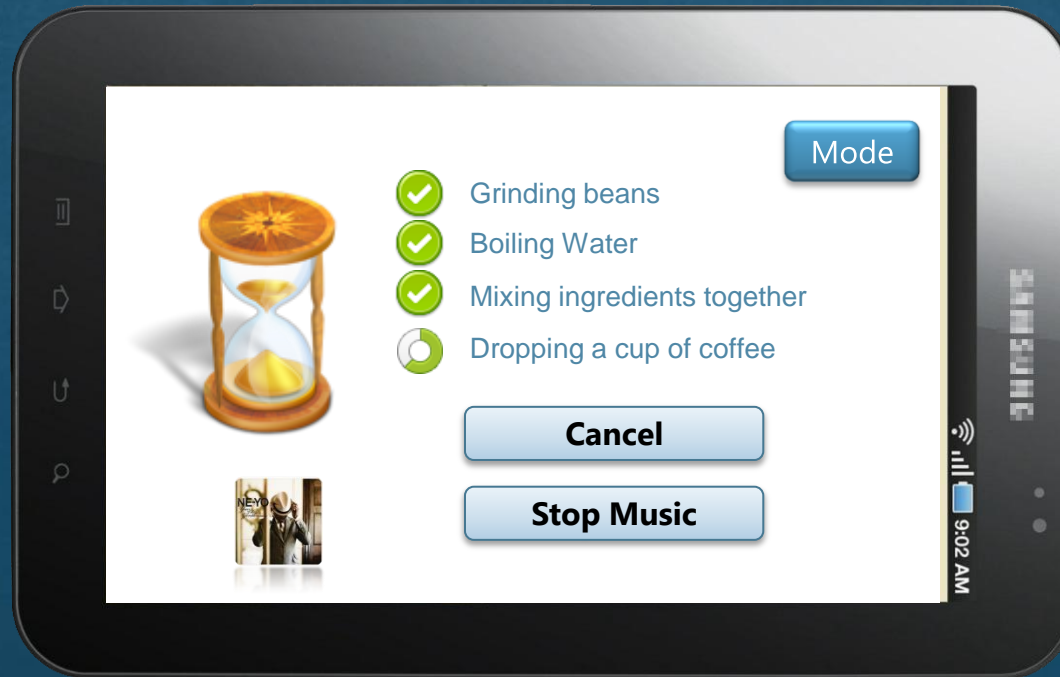
# 2142. GUI

- Select music

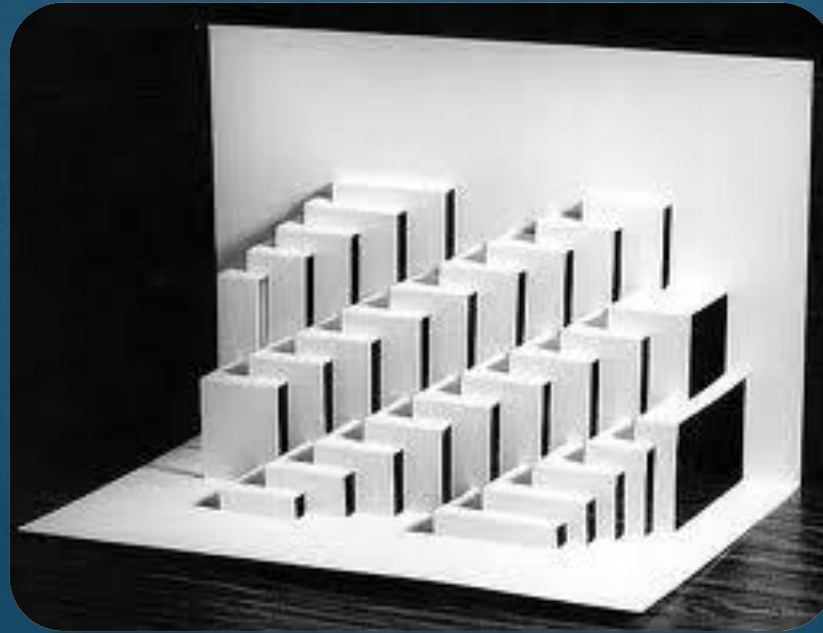


# 2142. GUI

- Cancel ordered coffee (during making a cup of coffee)
- Stop music

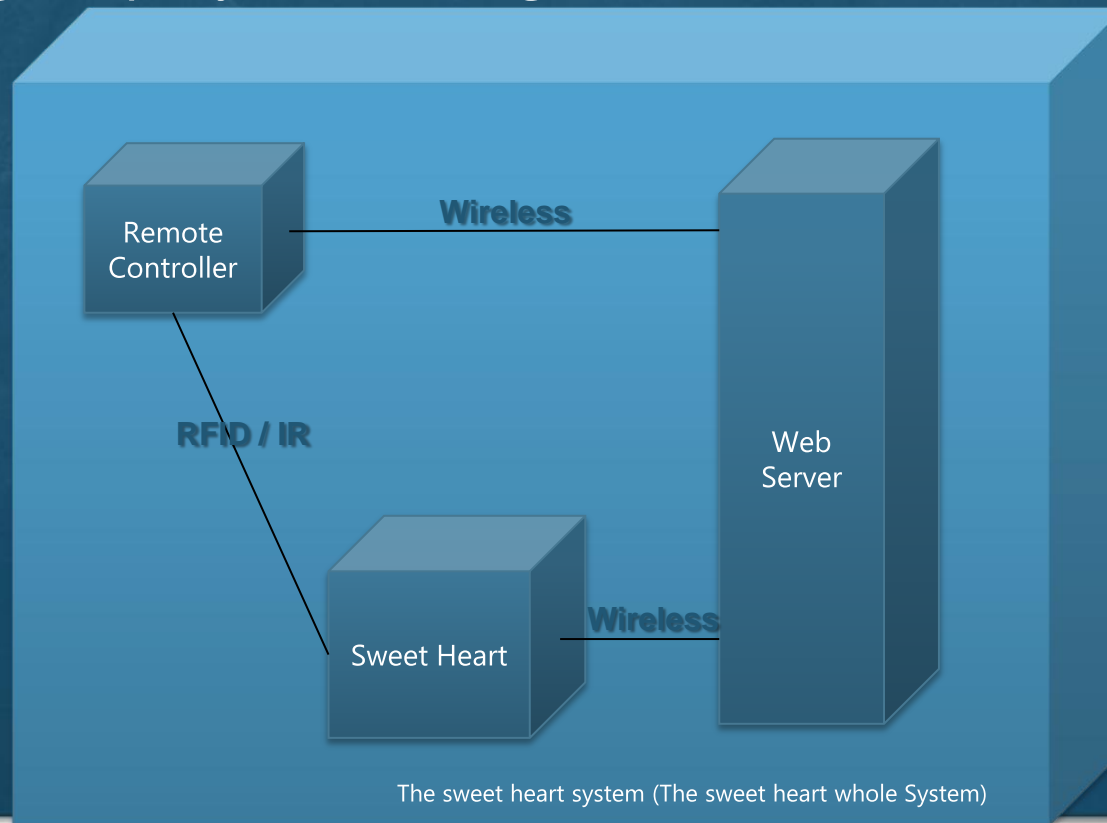


# *System architecture*



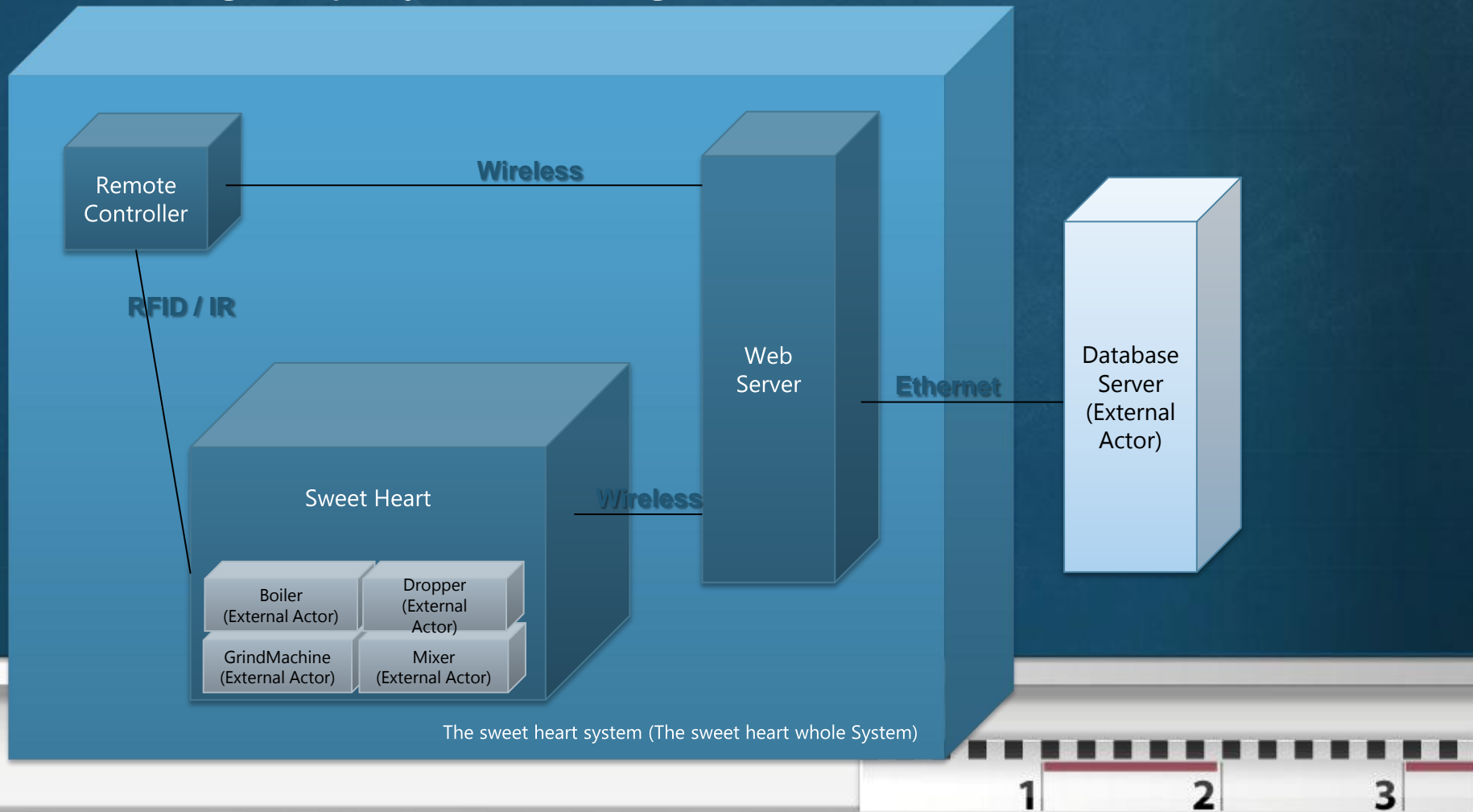
# 2143. Refine System Architecture

## 1. Drawing Deployment Diagram



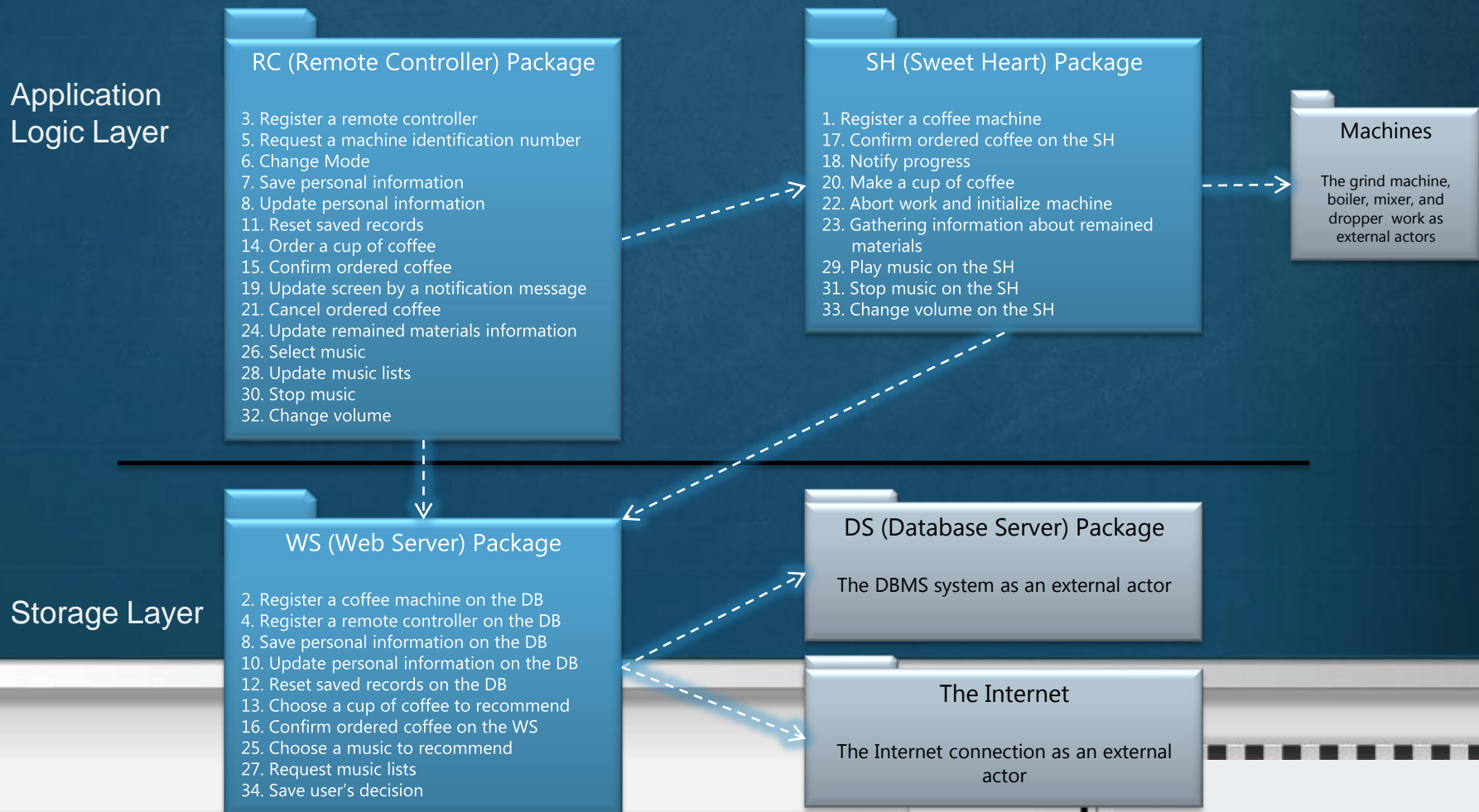
# 2143. Refine System Architecture

## 1. Drawing Deployment Diagram (with External Actors)



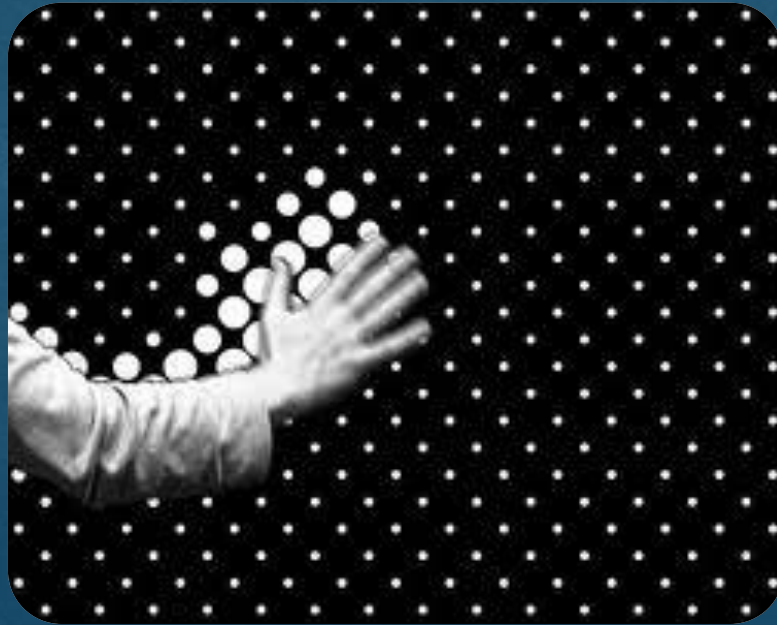
# 2143. Refine System Architecture

## 2. Drawing Package Diagram



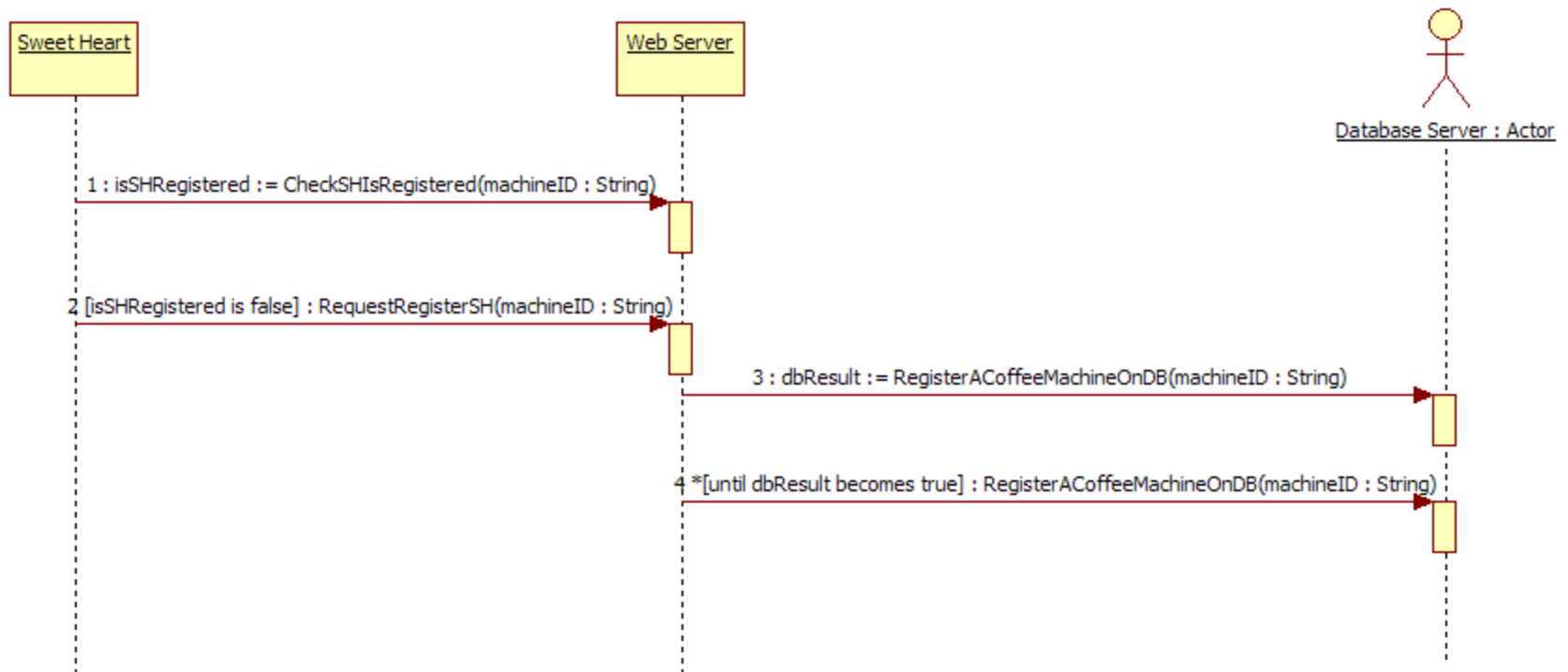


# *Interaction diagrams*



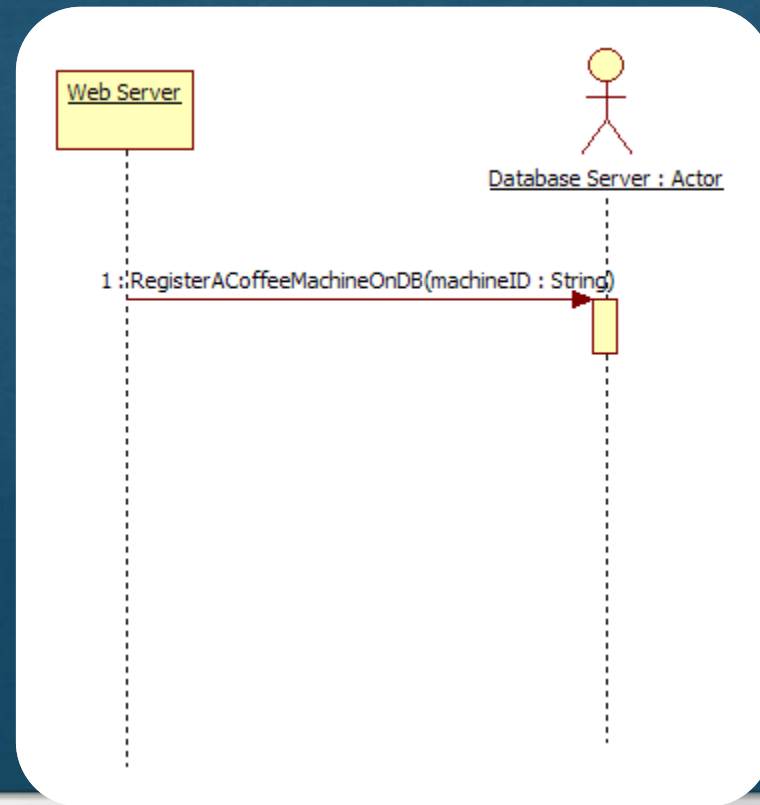
# 2144. Define Interaction Diagram

## 1. Register a coffee machine



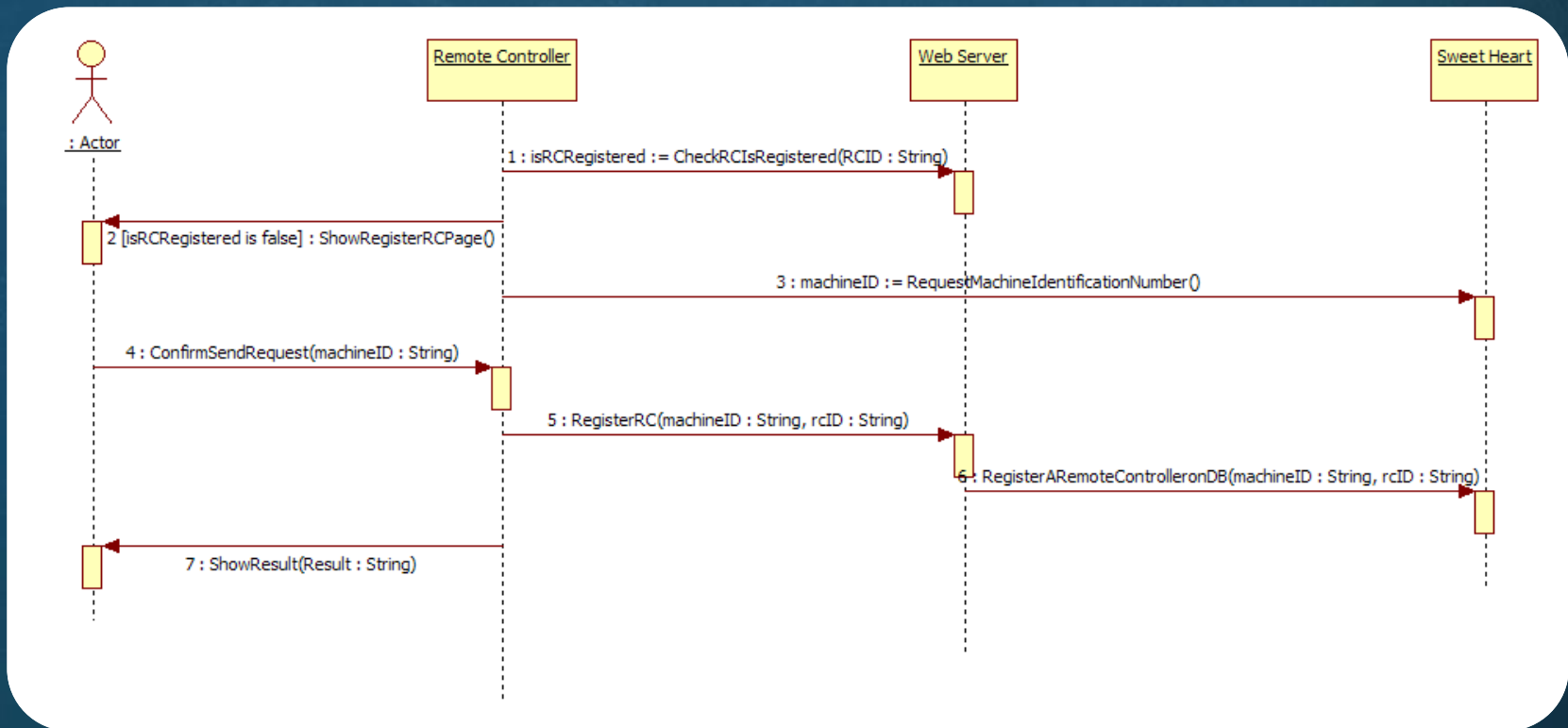
# 2144. Define Interaction Diagram

## 2. Register a coffee machine on the DB



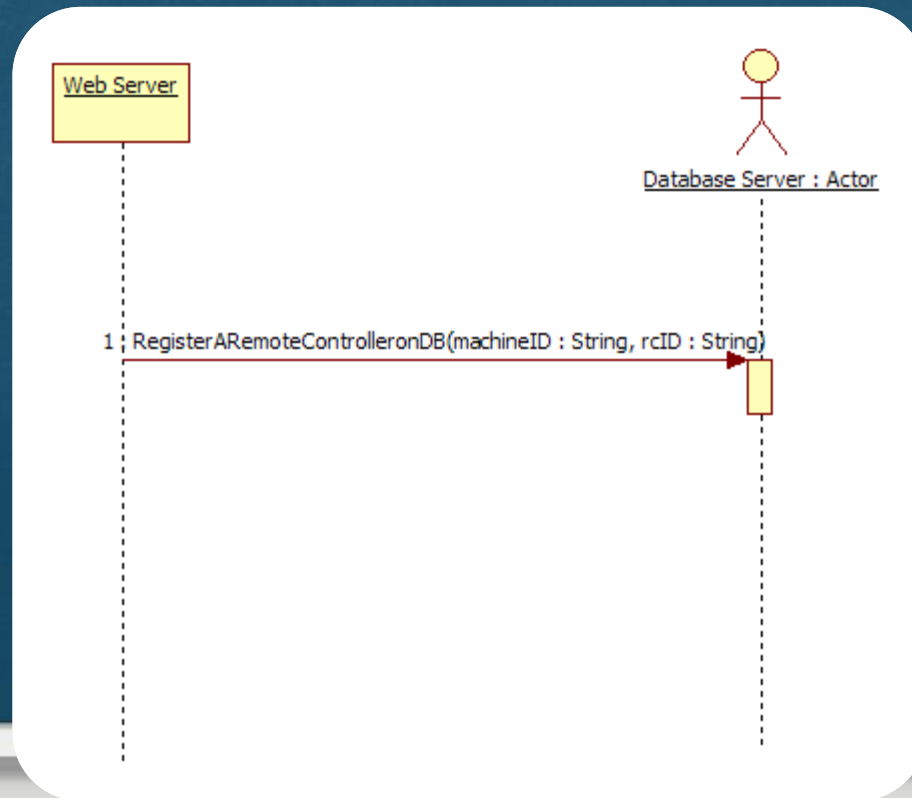
# 2144. Define Interaction Diagram

## 3. Register a remote controller



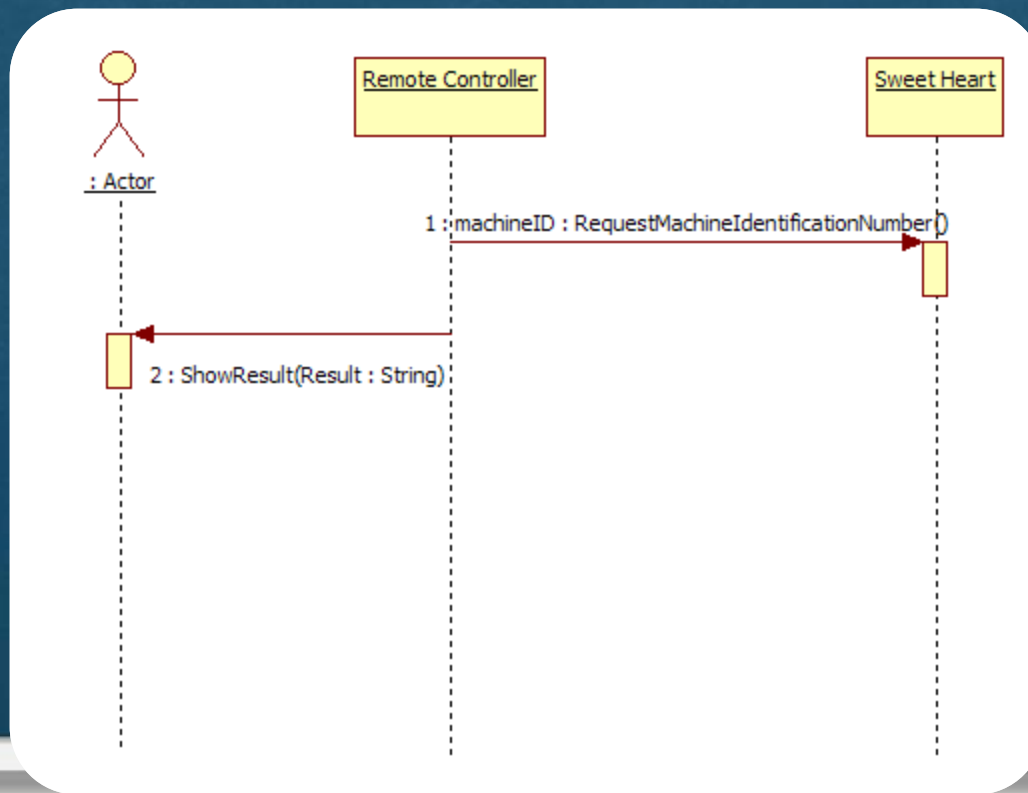
# 2144. Define Interaction Diagram

## 4. Register a remote controller on the DB



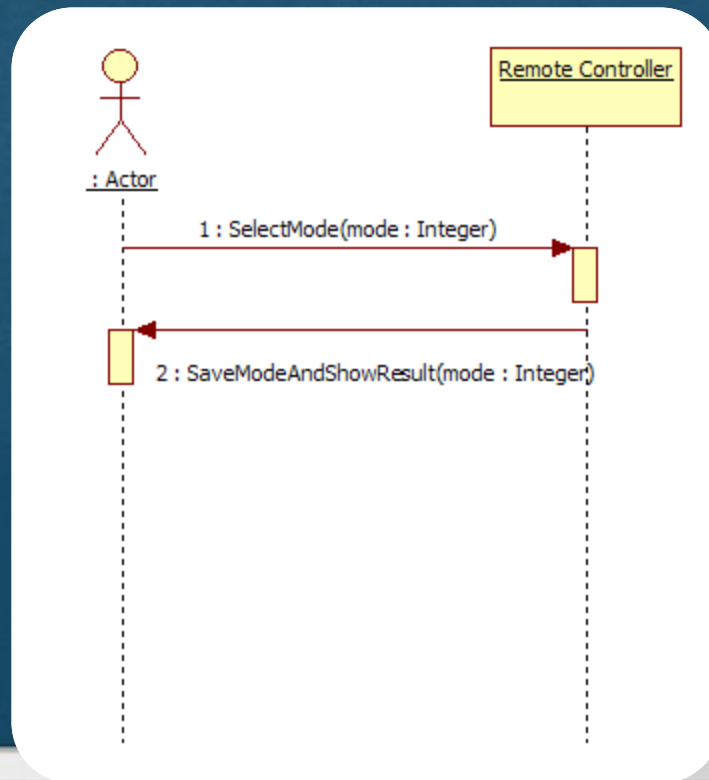
# 2144. Define Interaction Diagram

## 5. Request a machine identification number



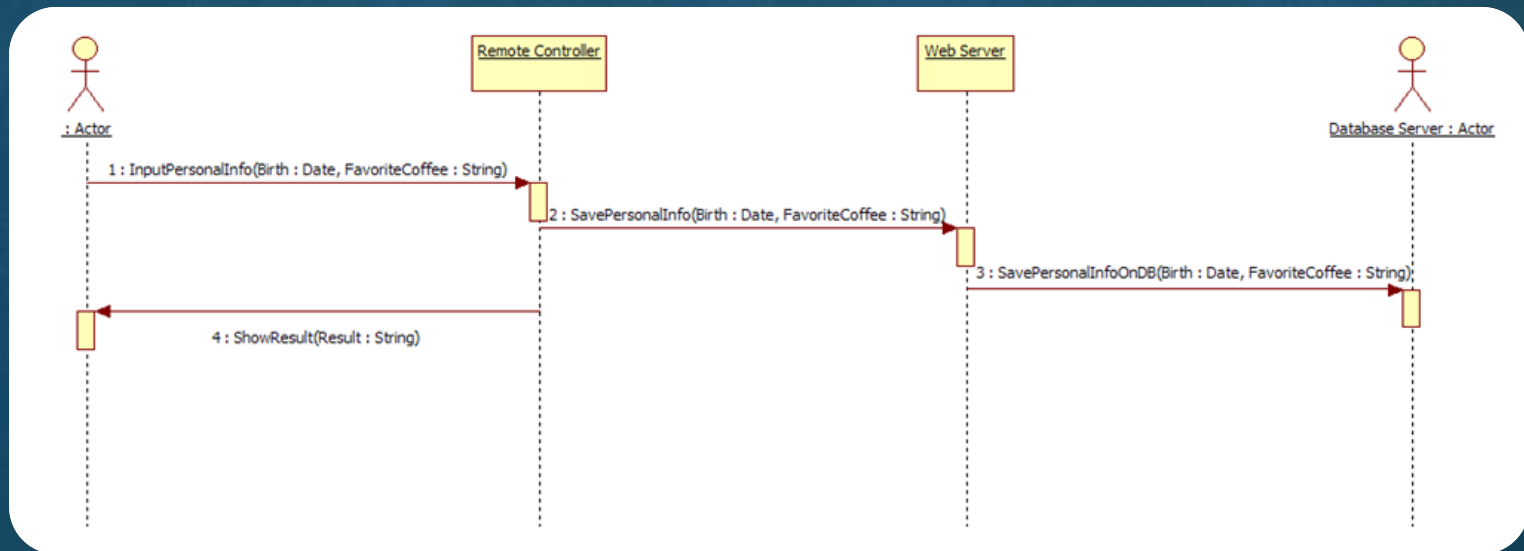
# 2144. Define Interaction Diagram

## 6. Change Mode



# 2144. Define Interaction Diagram

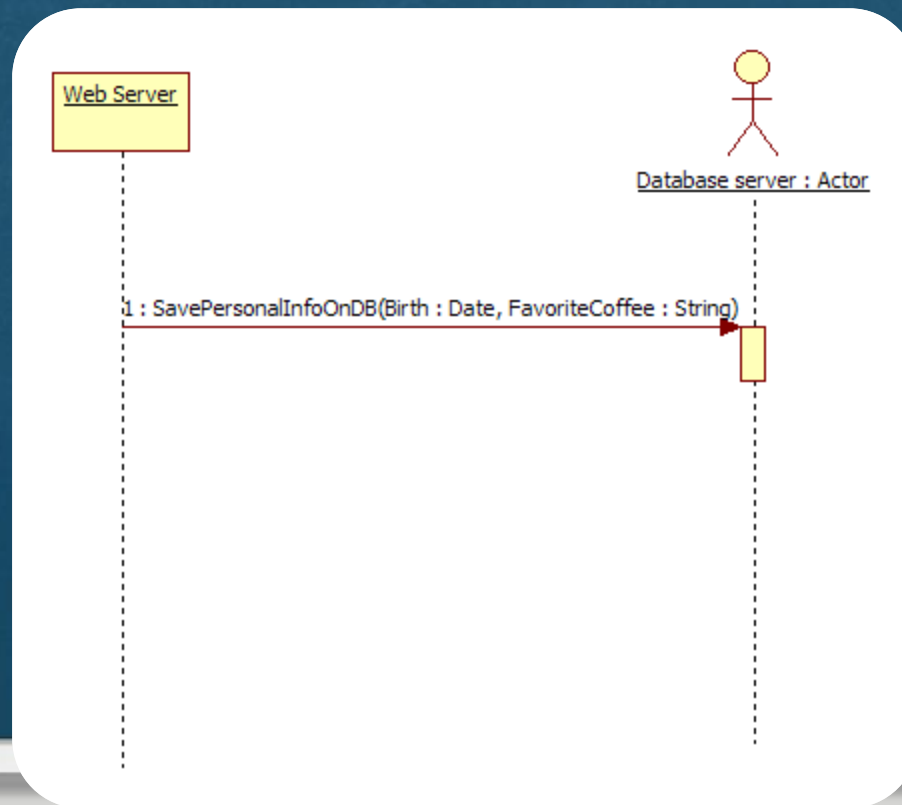
## 7. Save personal information





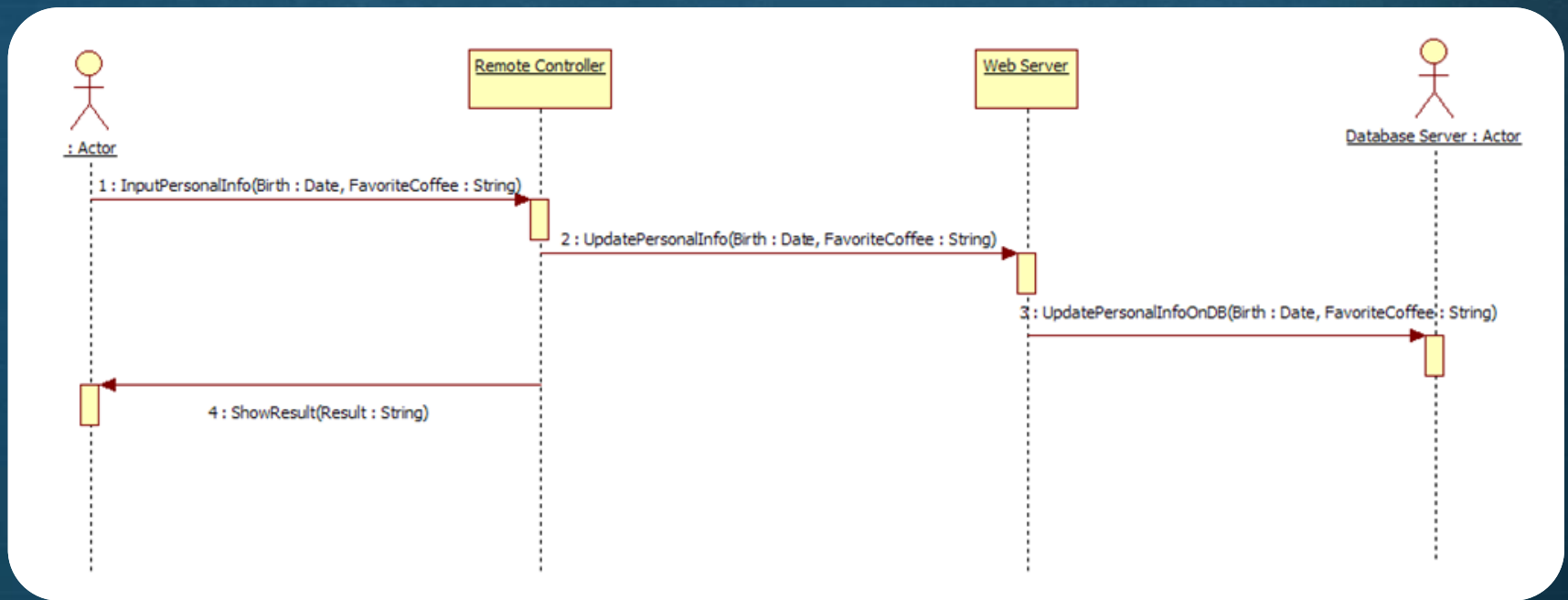
# 2144. Define Interaction Diagram

## 8. Save personal information on the DB



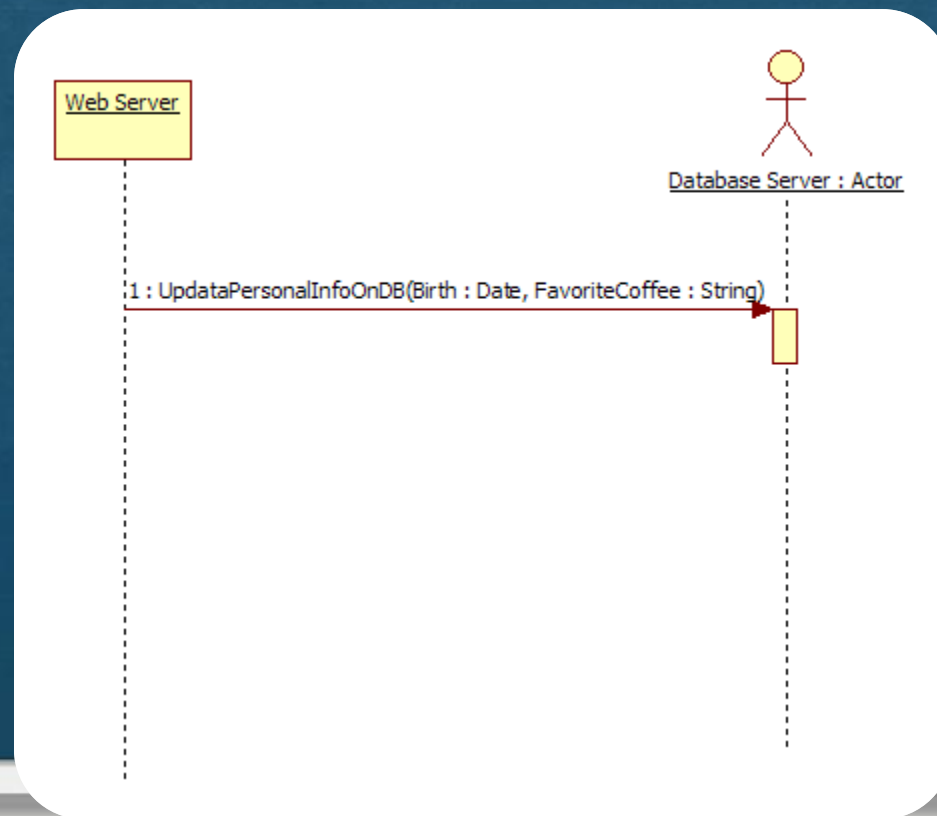
# 2144. Define Interaction Diagram

## 9. Update personal information



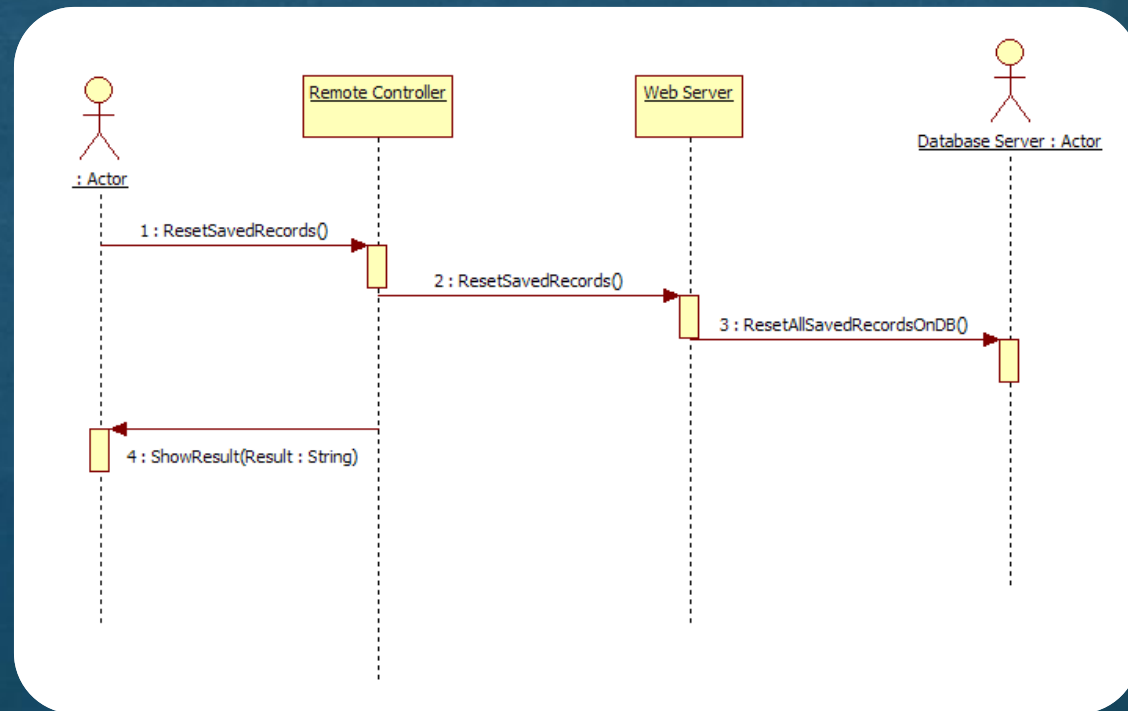
# 2144. Define Interaction Diagram

## 10. Update personal information on the DB



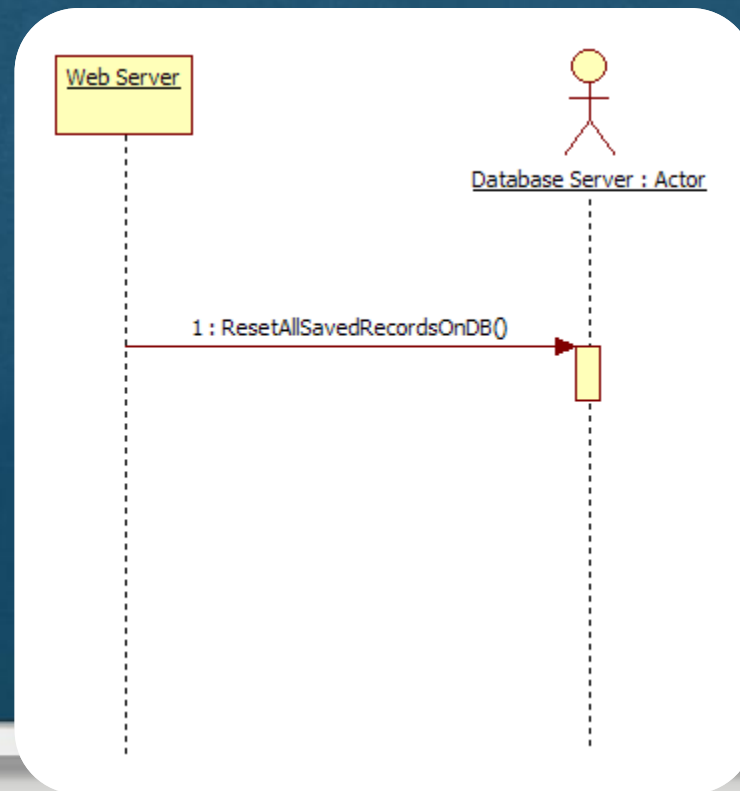
# 2143. Define Interaction Diagram

## 11. Reset saved records



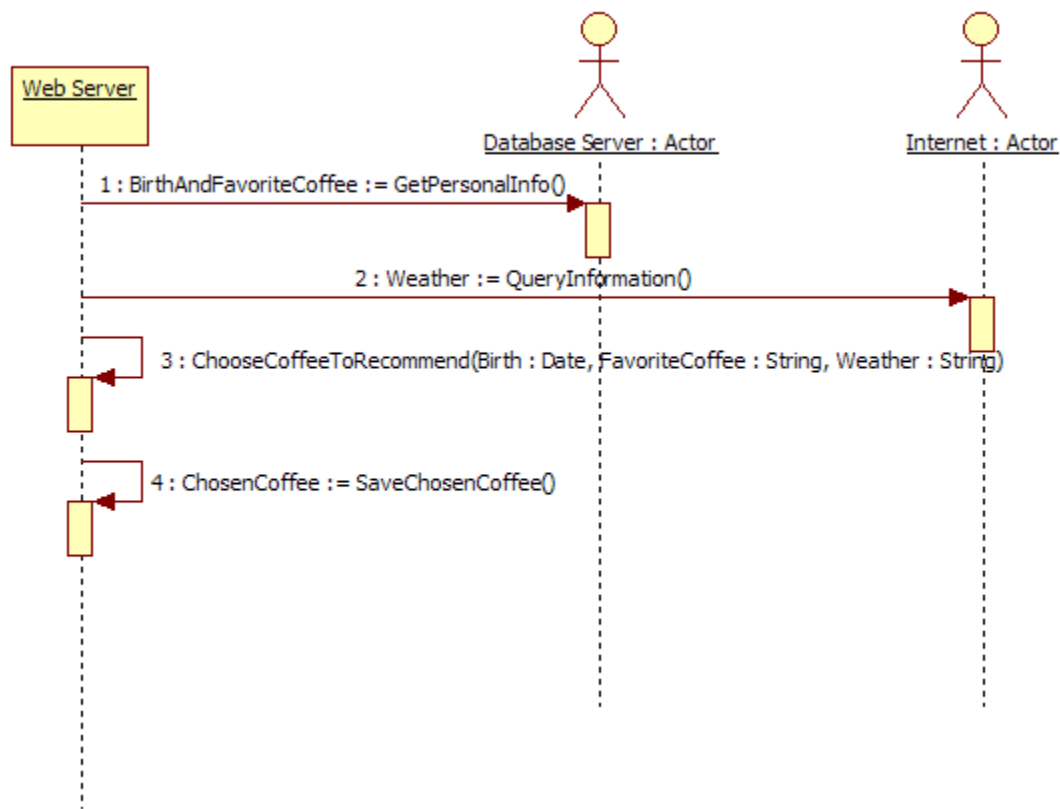
# 2144. Define Interaction Diagram

## 12. Reset saved records on the DB



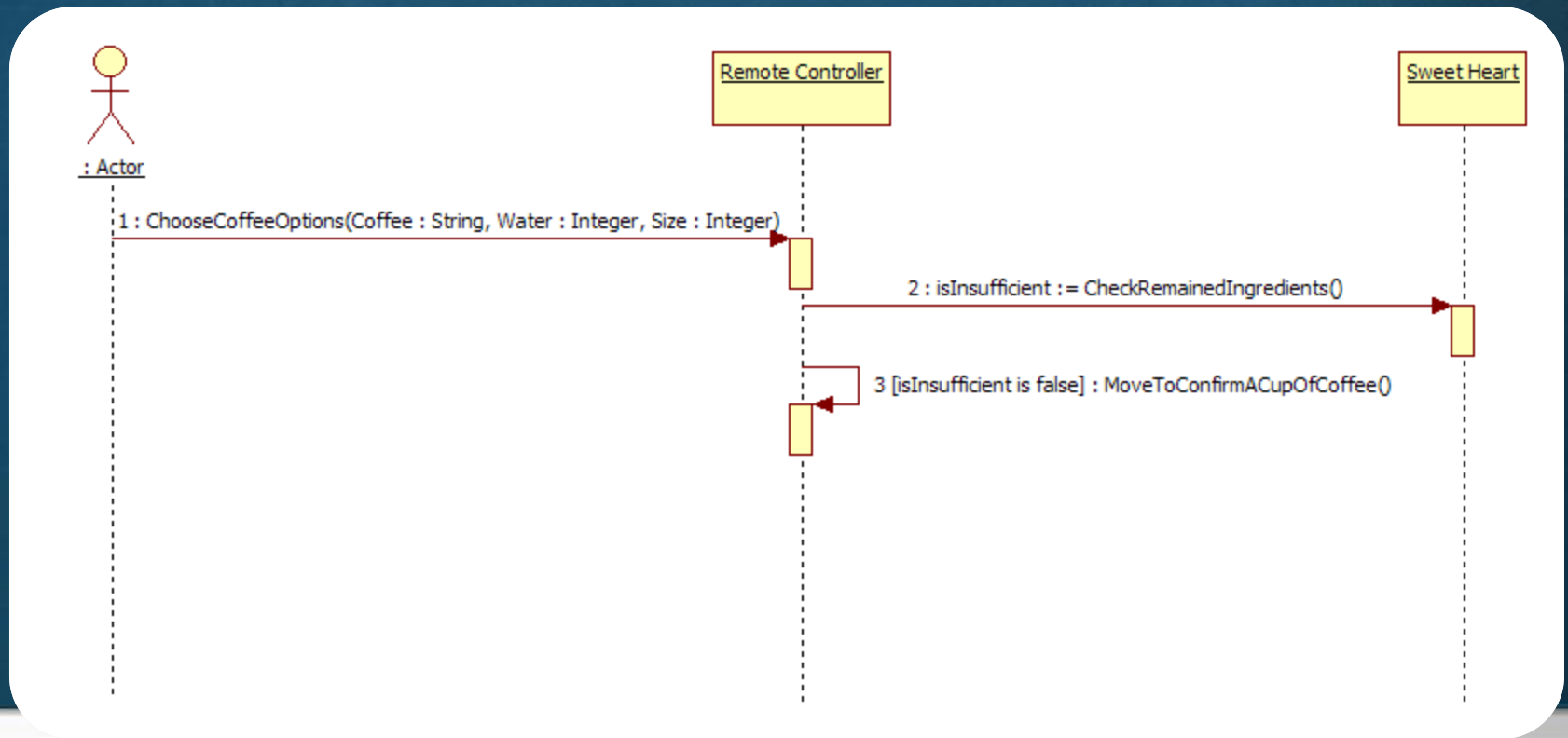
# 2144. Define Interaction Diagram

13. Choose a cup of coffee to recommend



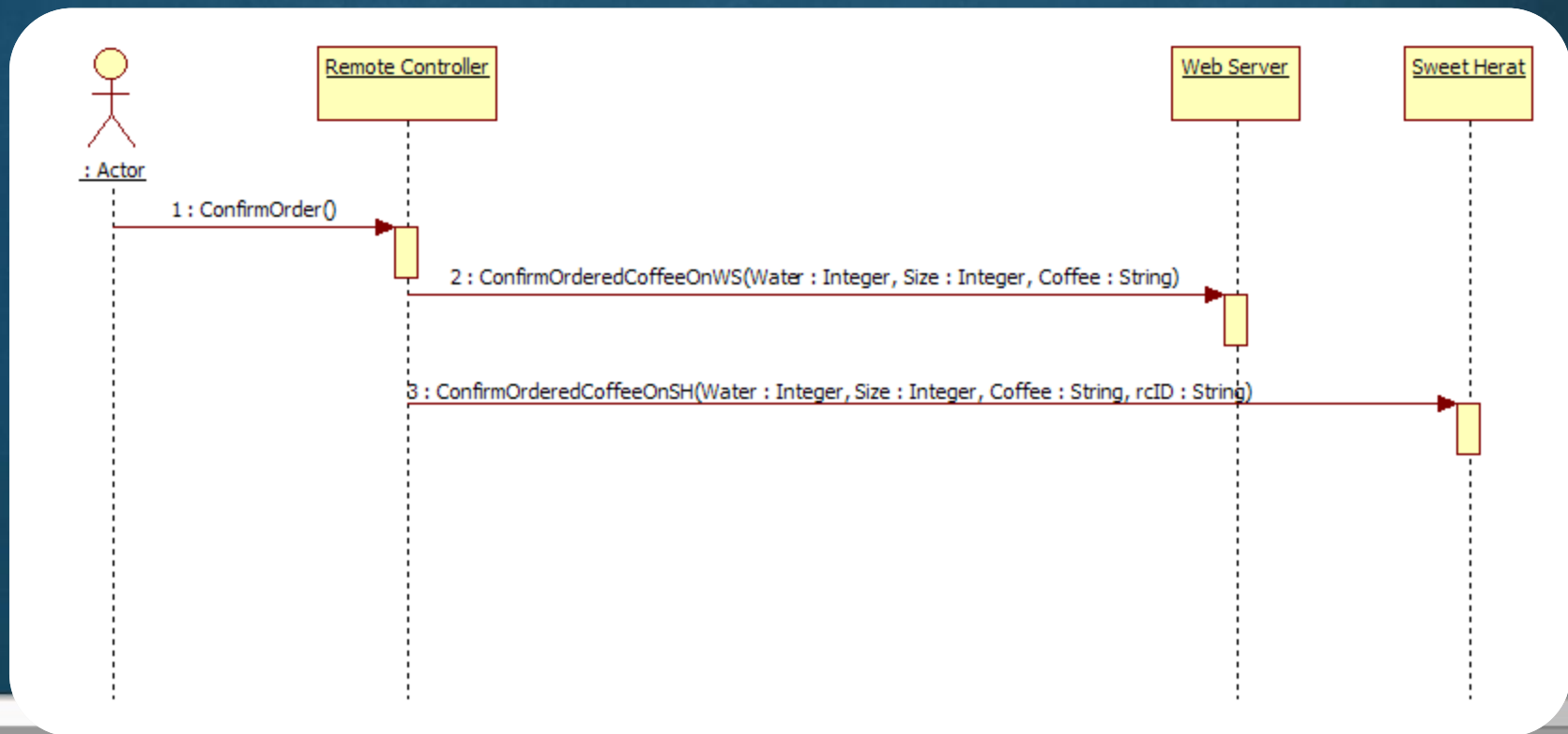
# 2144. Define Interaction Diagram

## 14. Order a cup of coffee



# 2144. Define Interaction Diagram

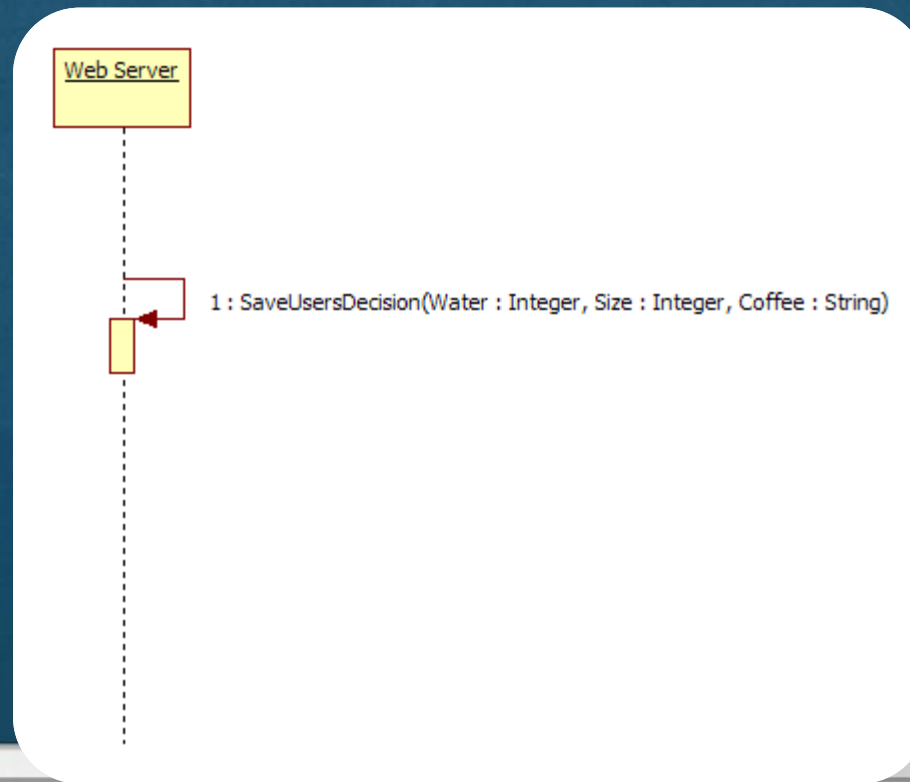
## 15. Confirm ordered coffee





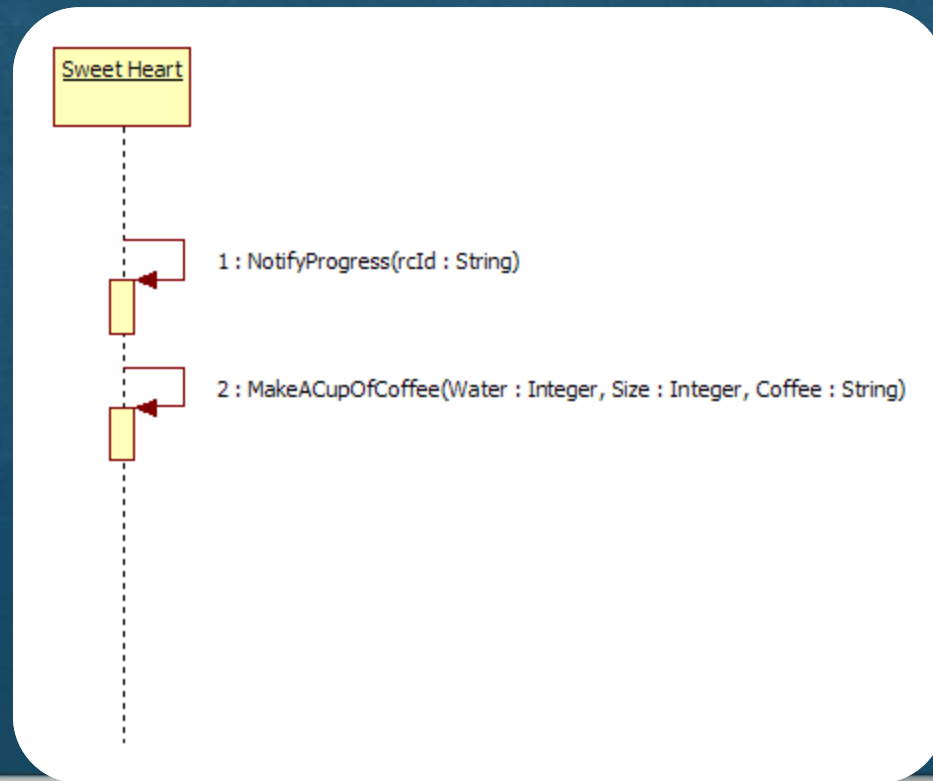
# 2144. Define Interaction Diagram

## 16. Confirm ordered coffee on the WS



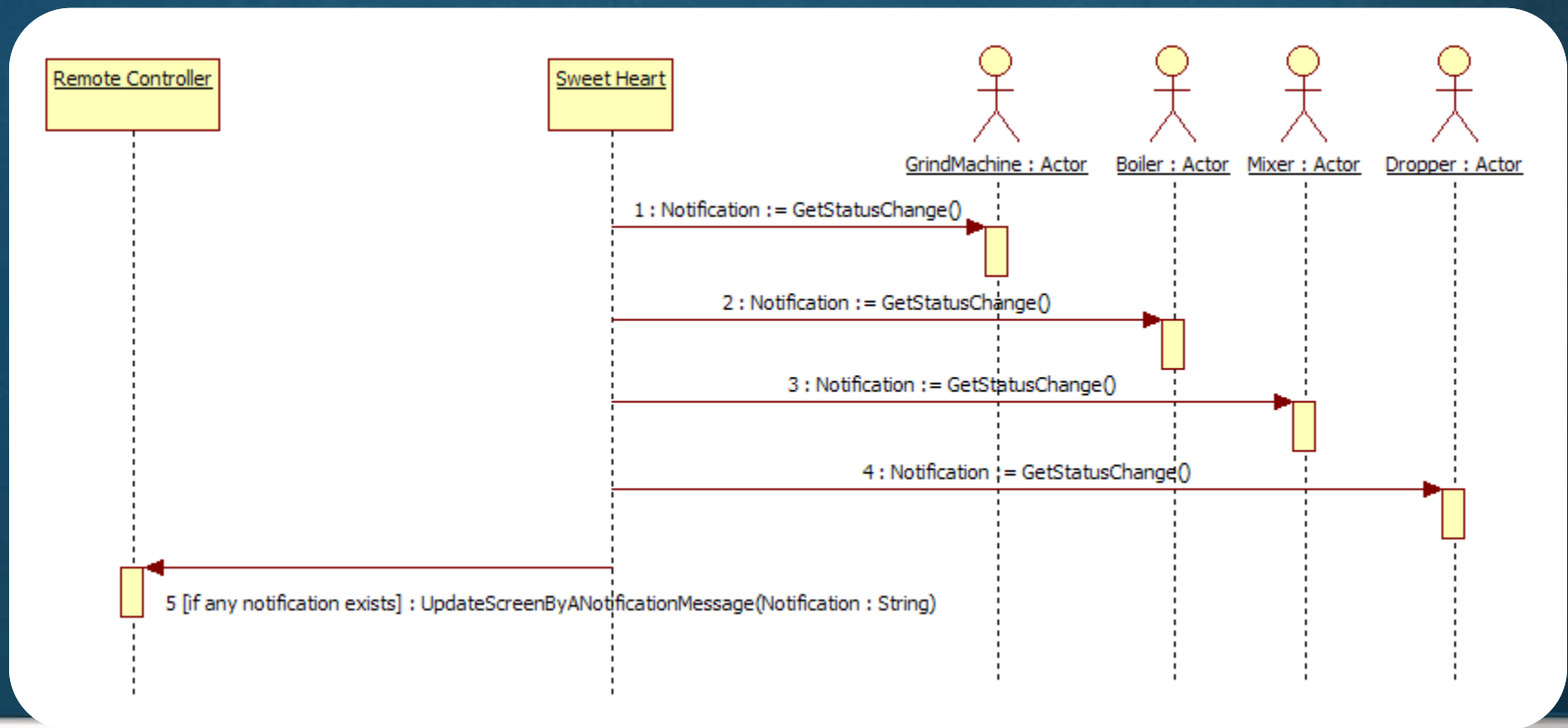
# 2144. Define Interaction Diagram

## 17. Confirm ordered coffee on the SH



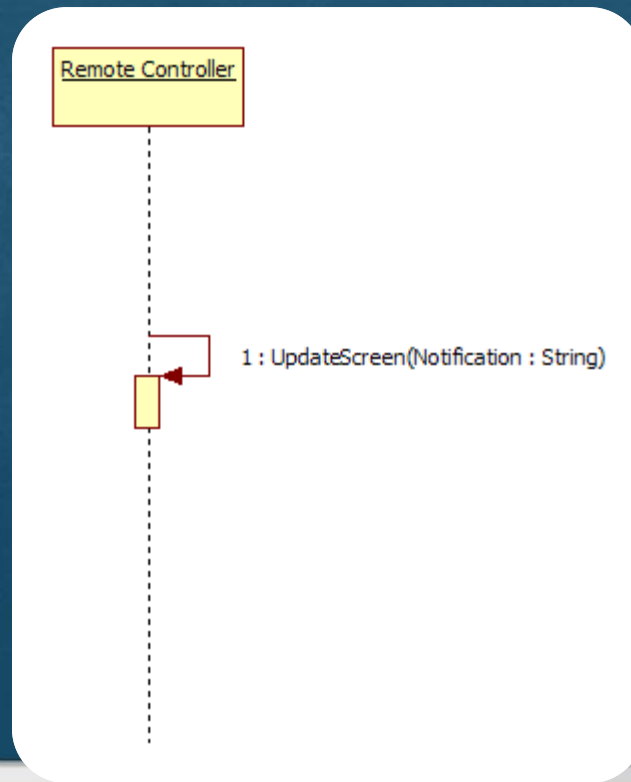
# 2144. Define Interaction Diagram

## 18. Notify progress



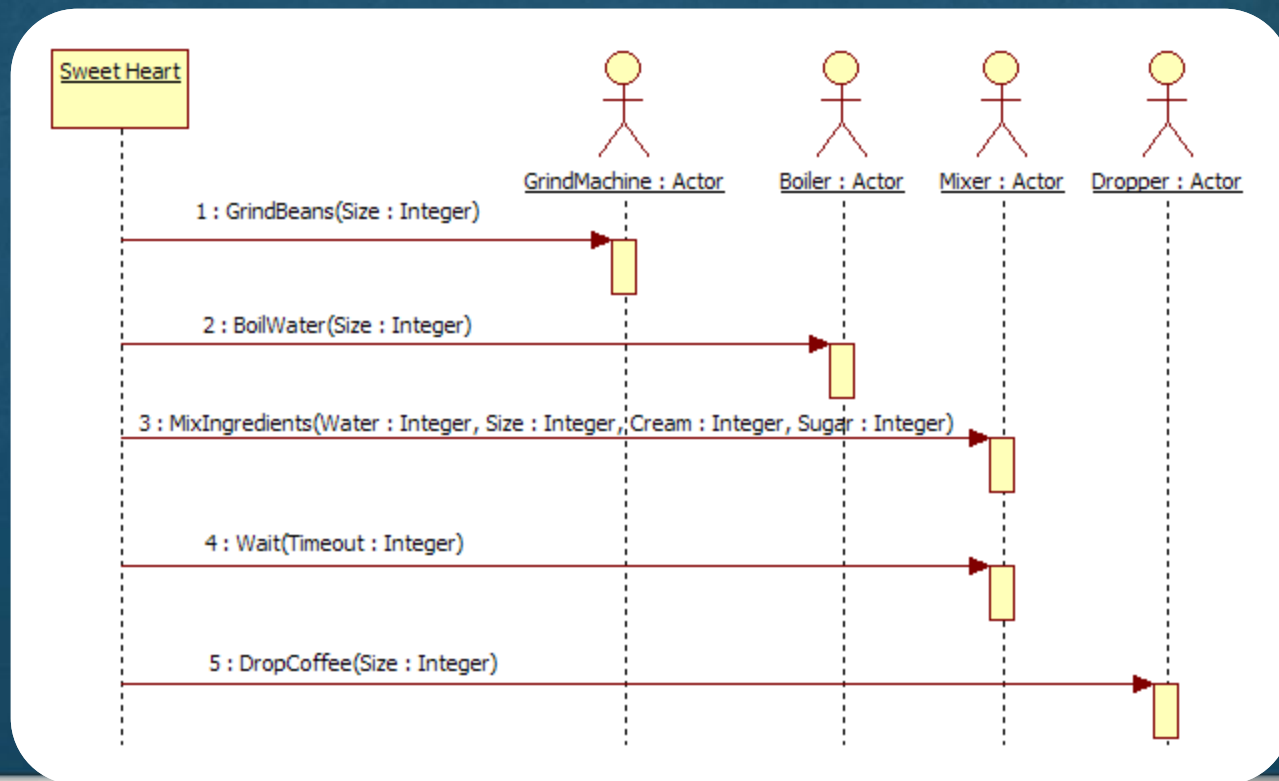
# 2144. Define Interaction Diagram

19. Update screen by a notification message



# 2144. Define Interaction Diagram

## 20. Make a cup of coffee



2 : DropCoffee(Size : Integer)

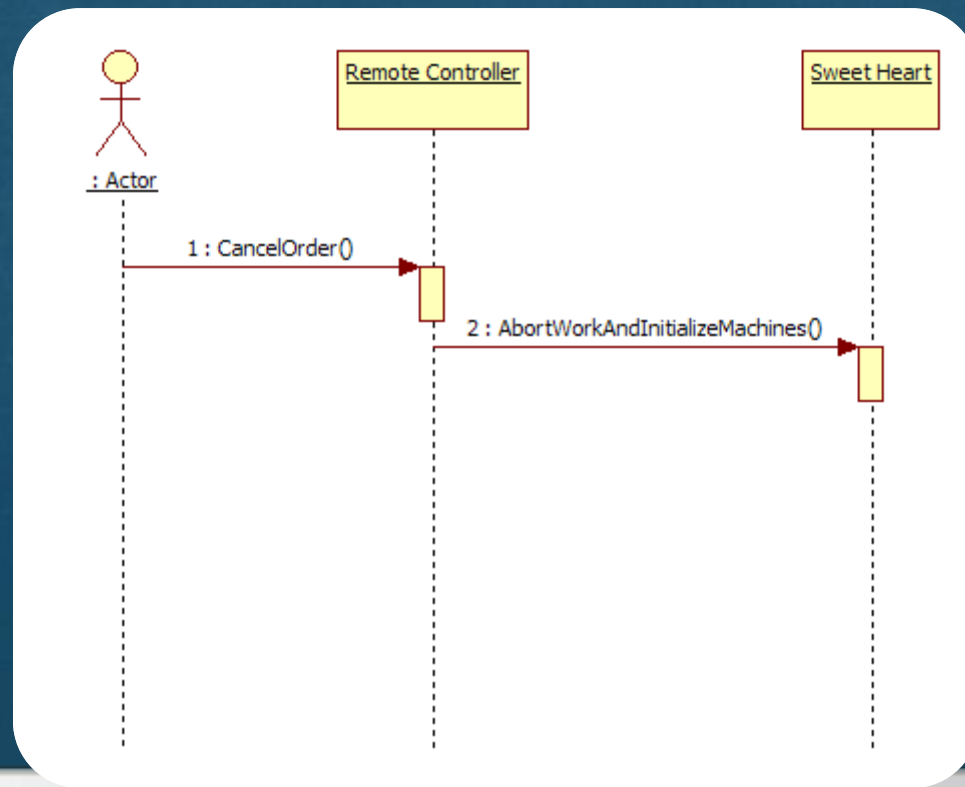
1

2

3

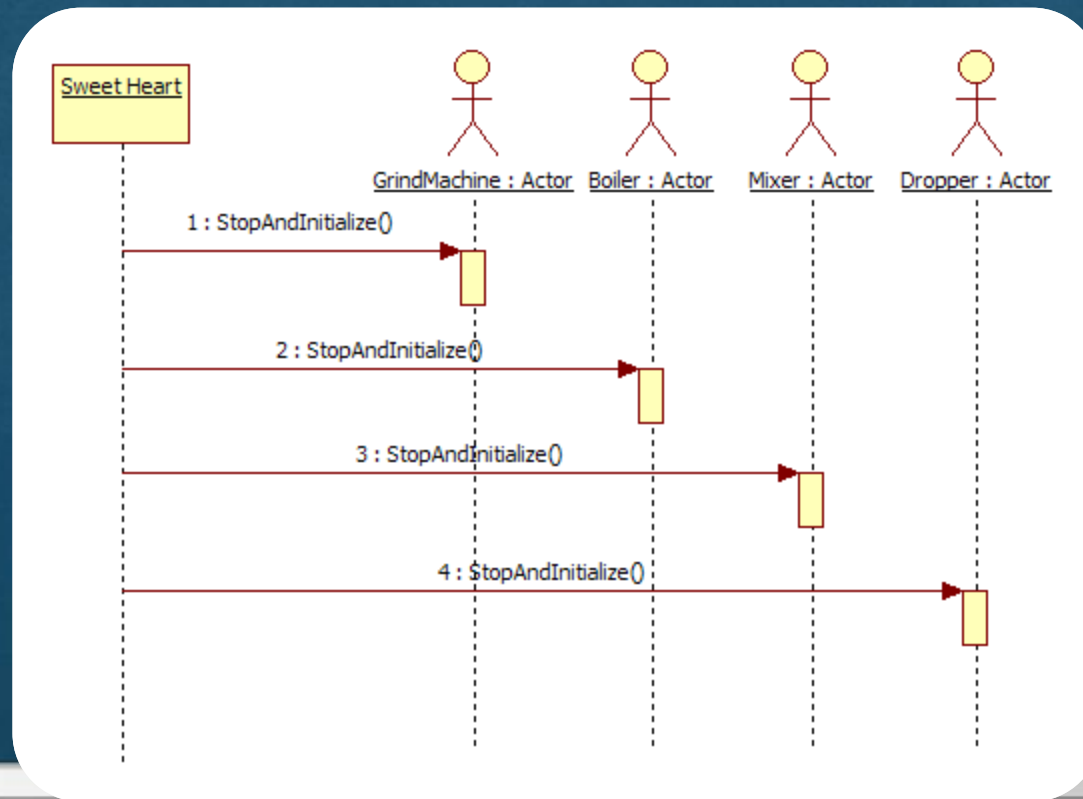
# 2144. Define Interaction Diagram

## 21. Cancel ordered coffee



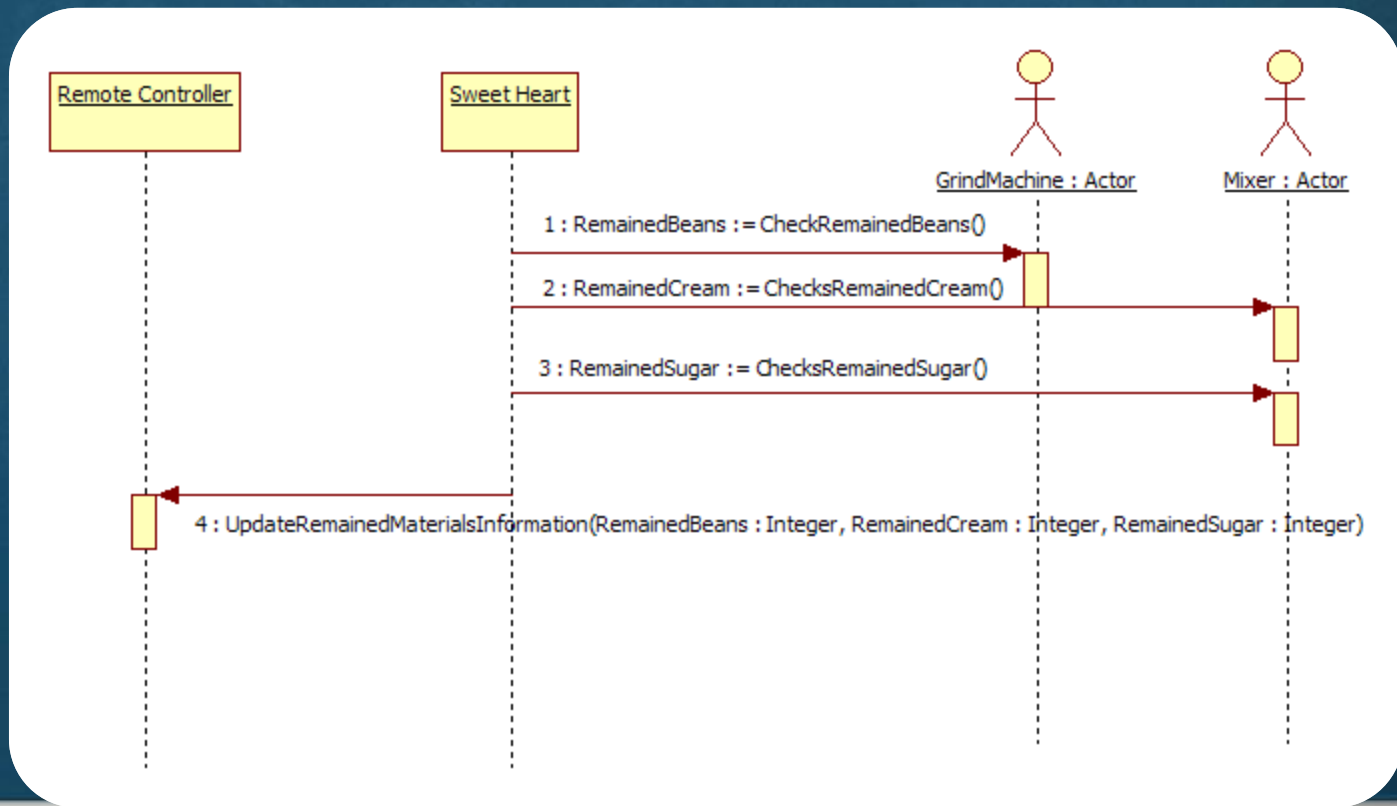
# 2144. Define Interaction Diagram

## 22. Abort work and initialize machines



# 2144. Define Interaction Diagram

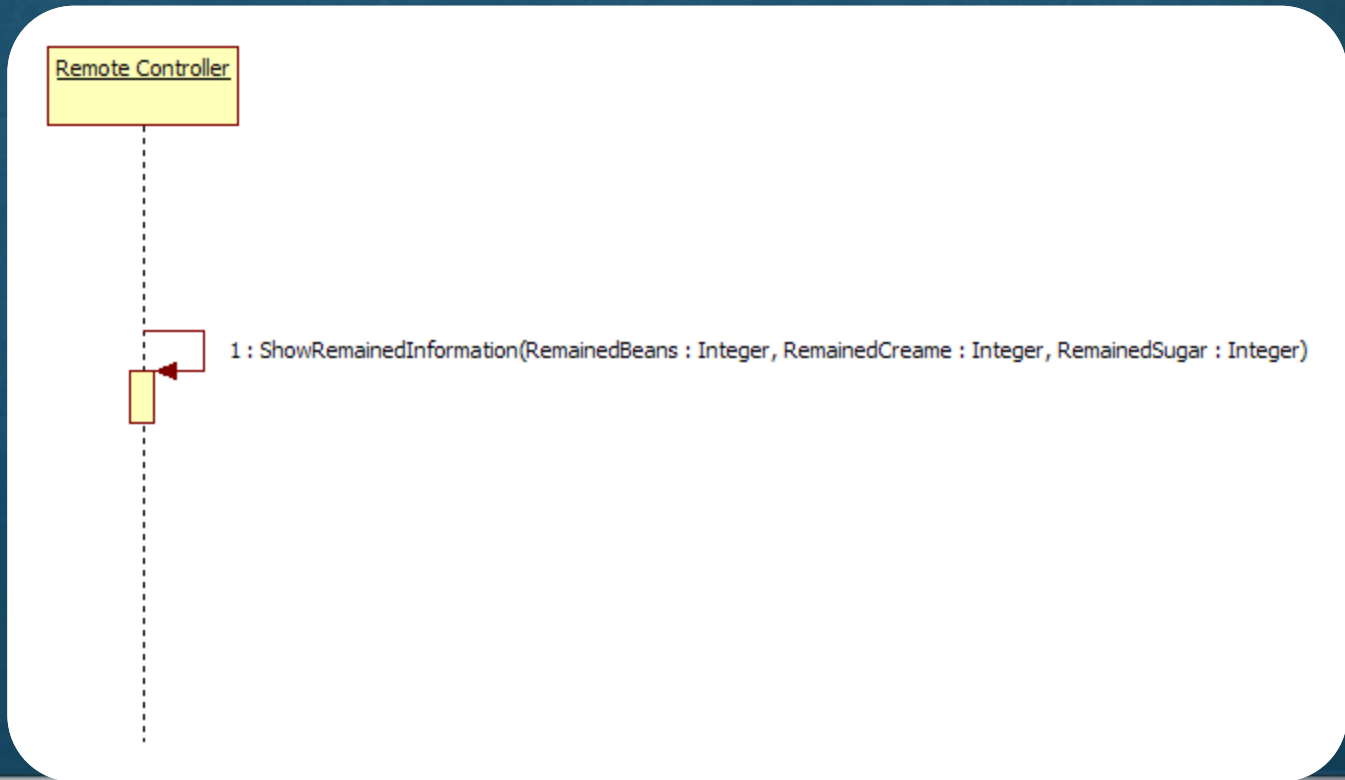
## 23. Gather information about remained materials





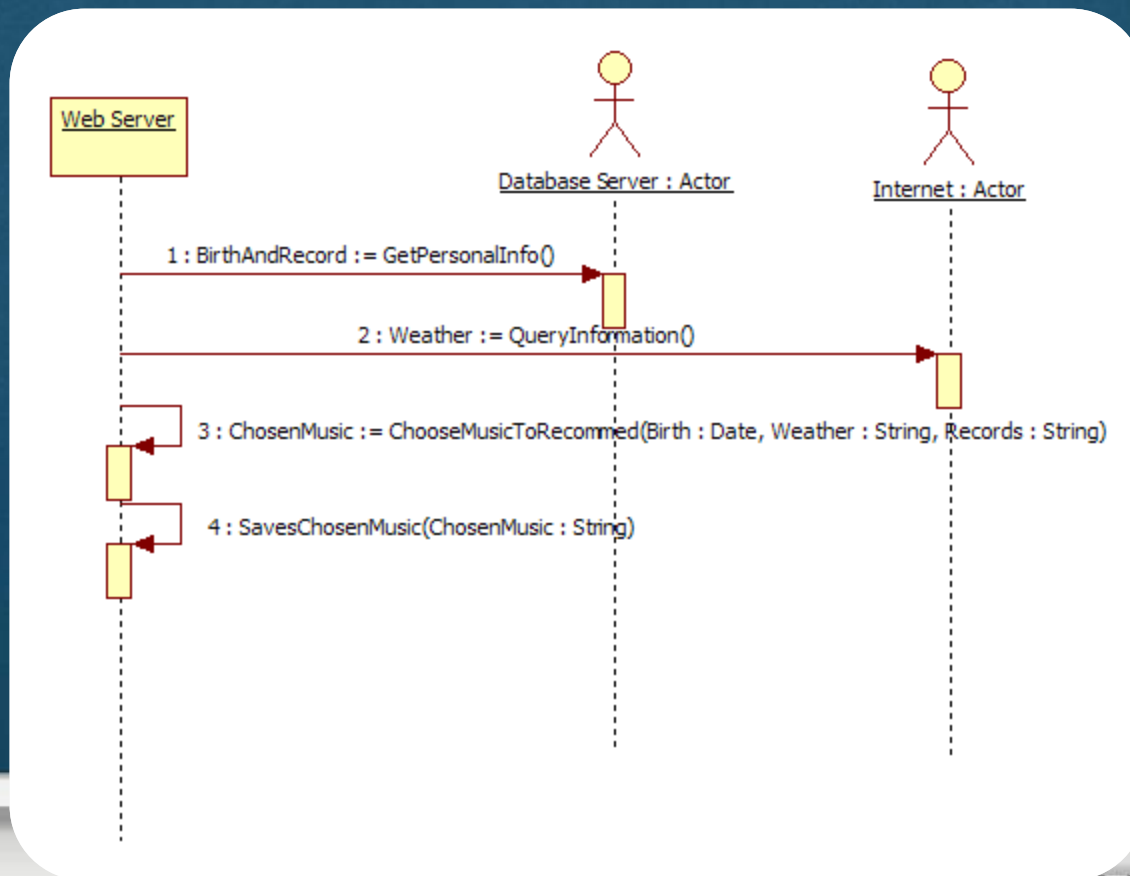
# 2144. Define Interaction Diagram

## 24. Update remained materials information



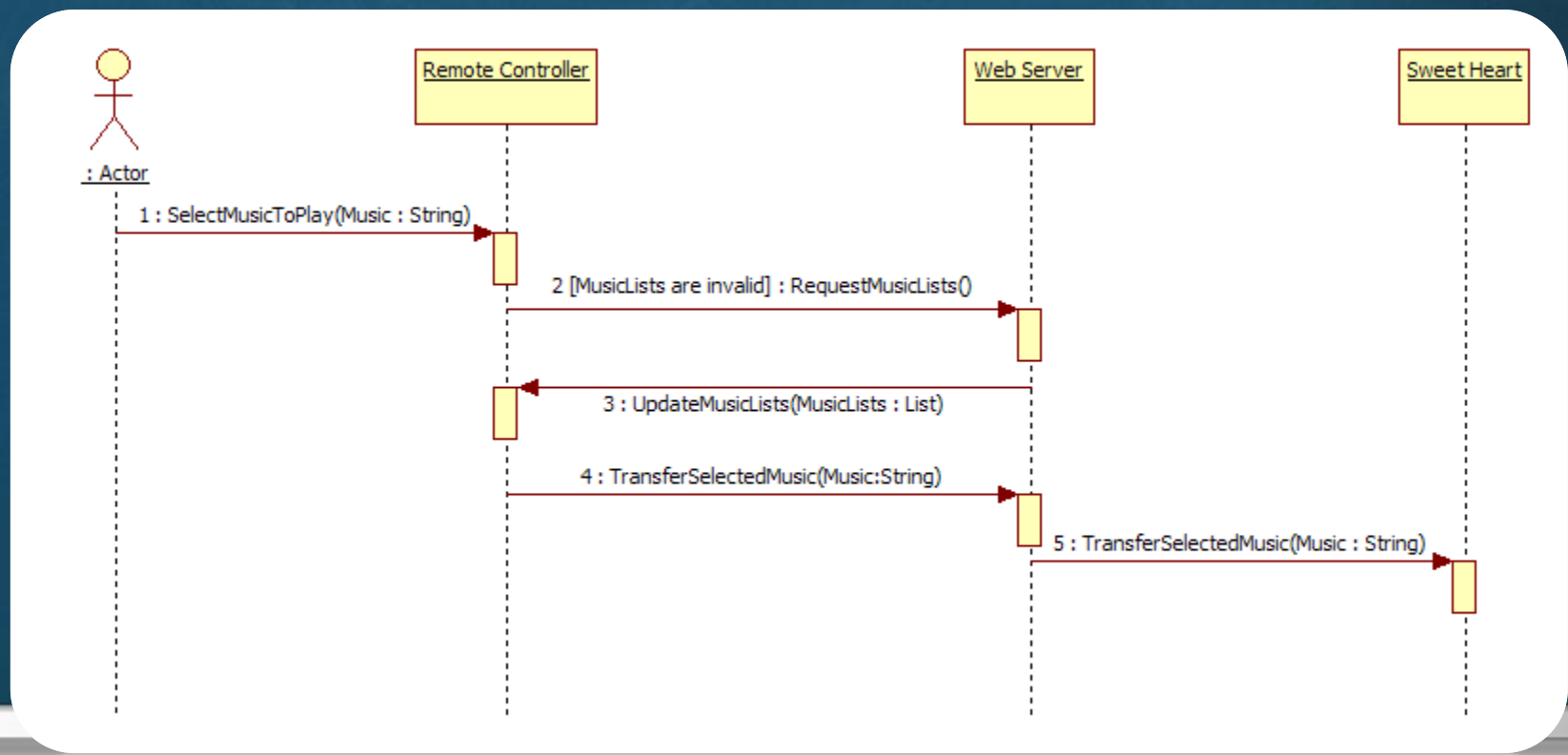
# 2144. Define Interaction Diagram

25. Choose a music to recommend



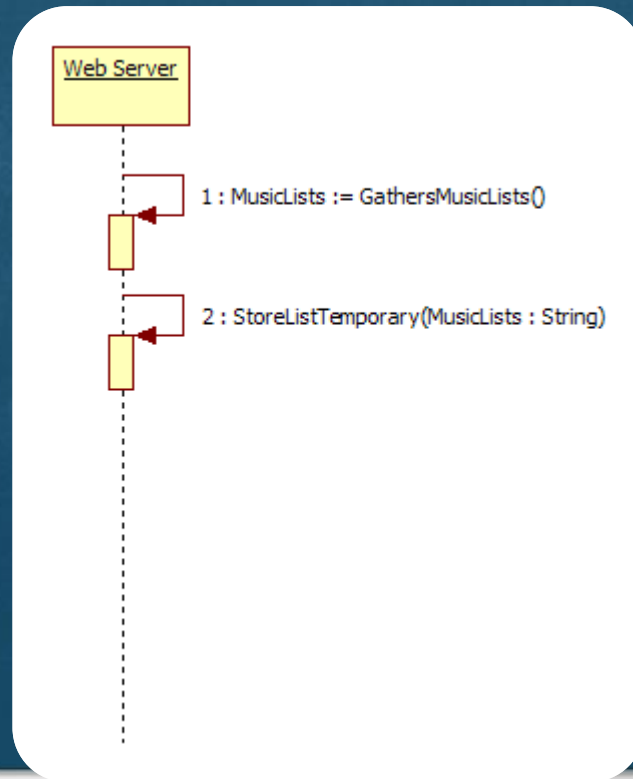
# 2144. Define Interaction Diagram

## 26. Select music



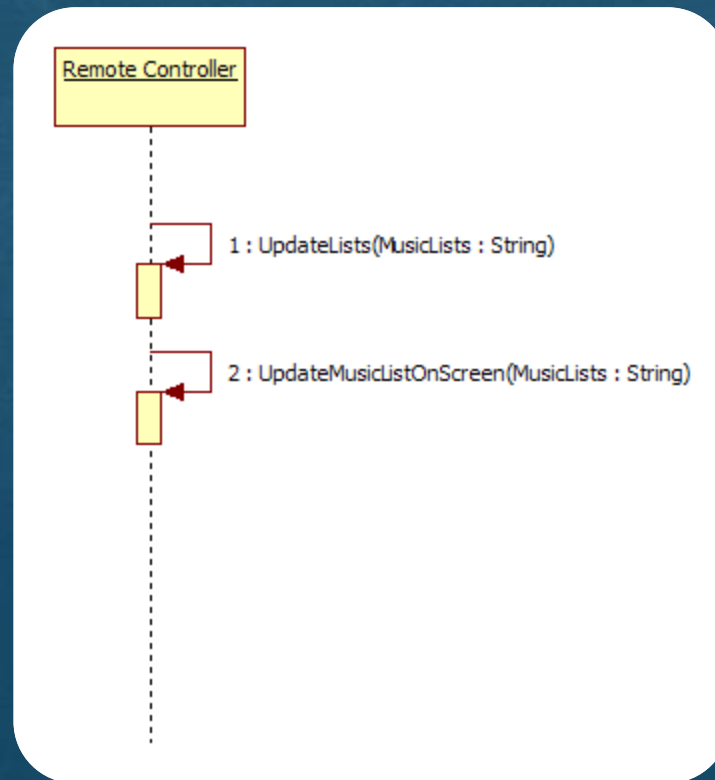
# 2144. Define Interaction Diagram

## 27. Request music lists



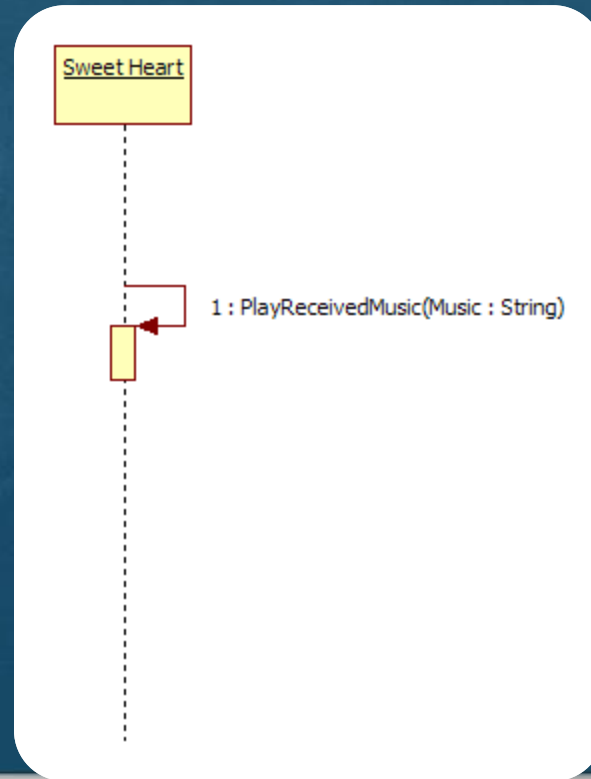
# 2144. Define Interaction Diagram

## 28. Update music lists



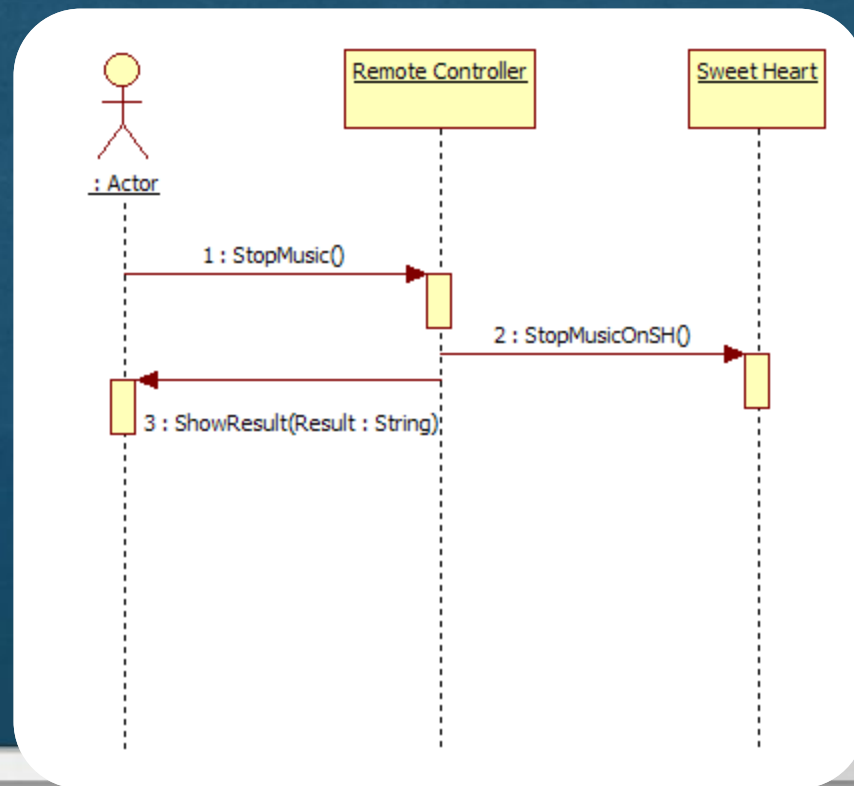
# 2144. Define Interaction Diagram

## 29. Play music on SH



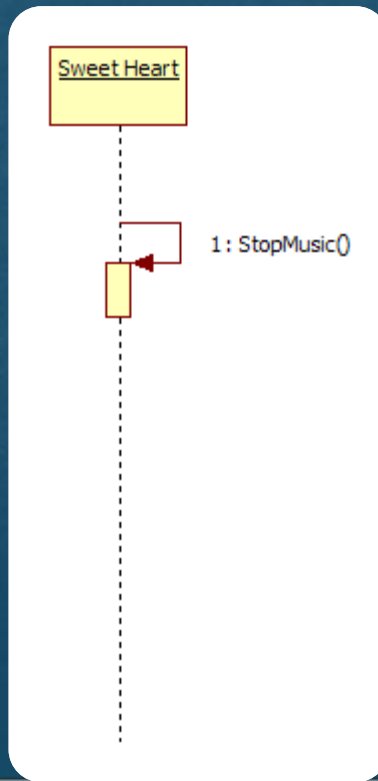
# 2144. Define Interaction Diagram

## 30. Stop music



# 2144. Define Interaction Diagram

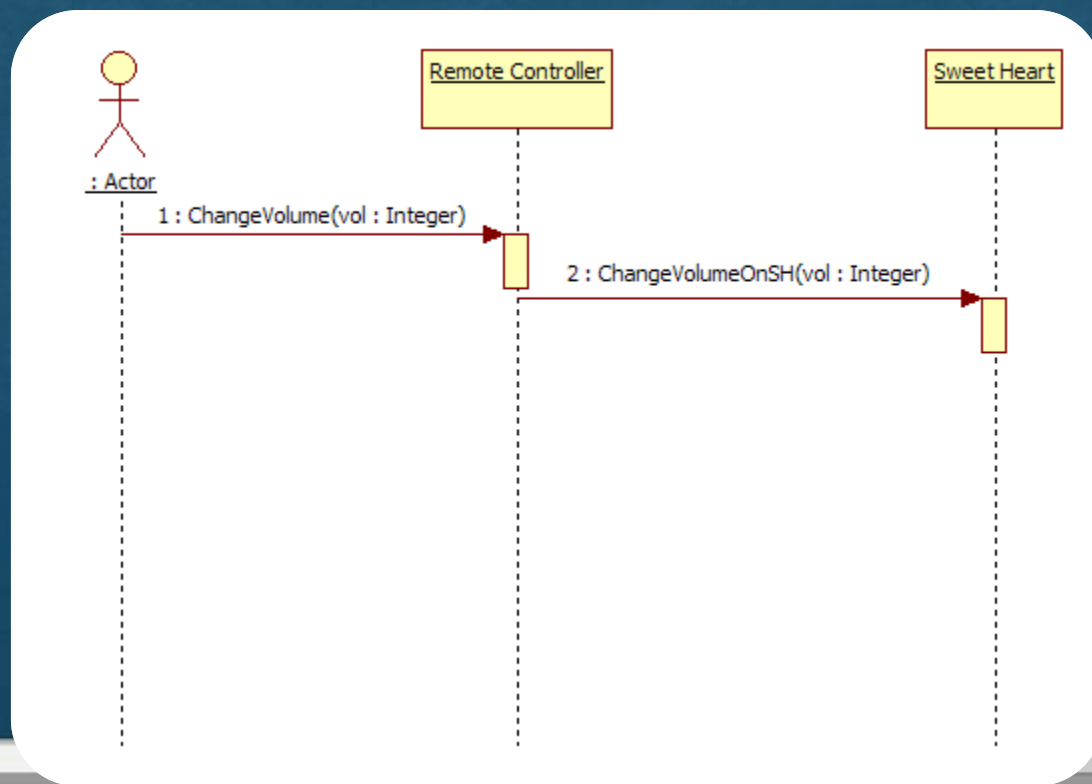
31. Stop music on SH





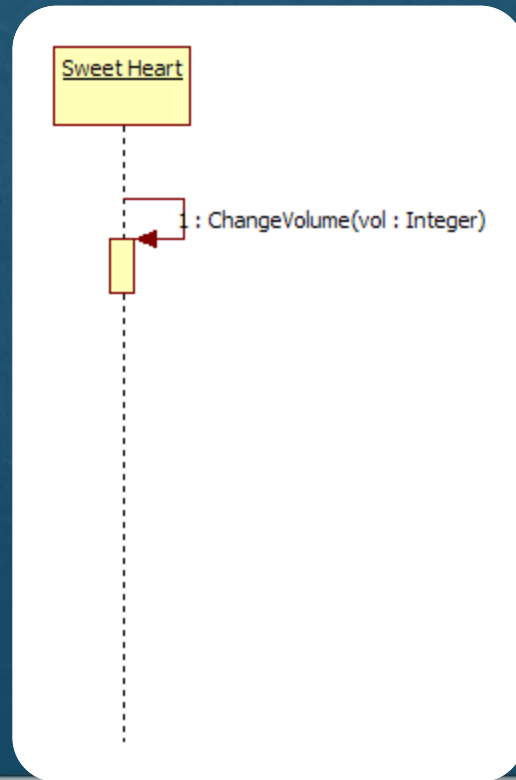
# 2144. Define Interaction Diagram

## 32. Change volume



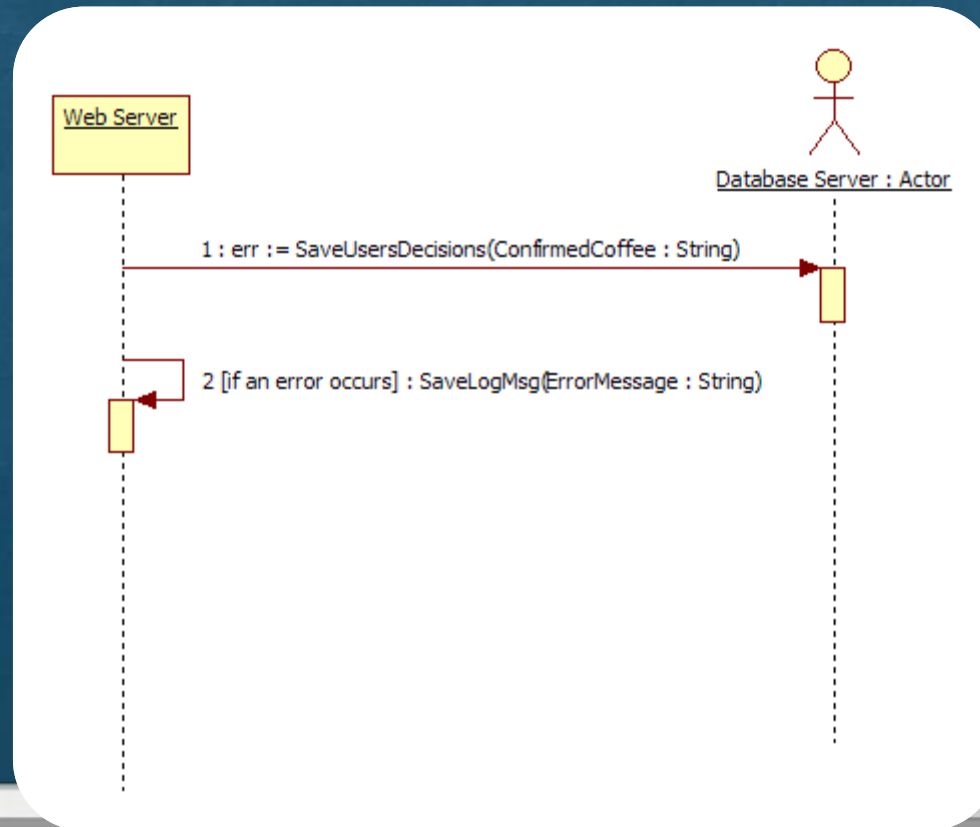
# 2144. Define Interaction Diagram

## 33. Change volume on SH

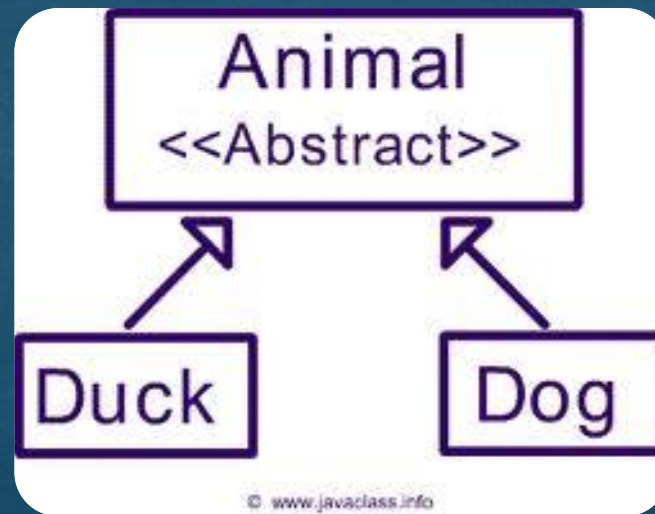


# 2144. Define Interaction Diagram

## 34. Save user's decision



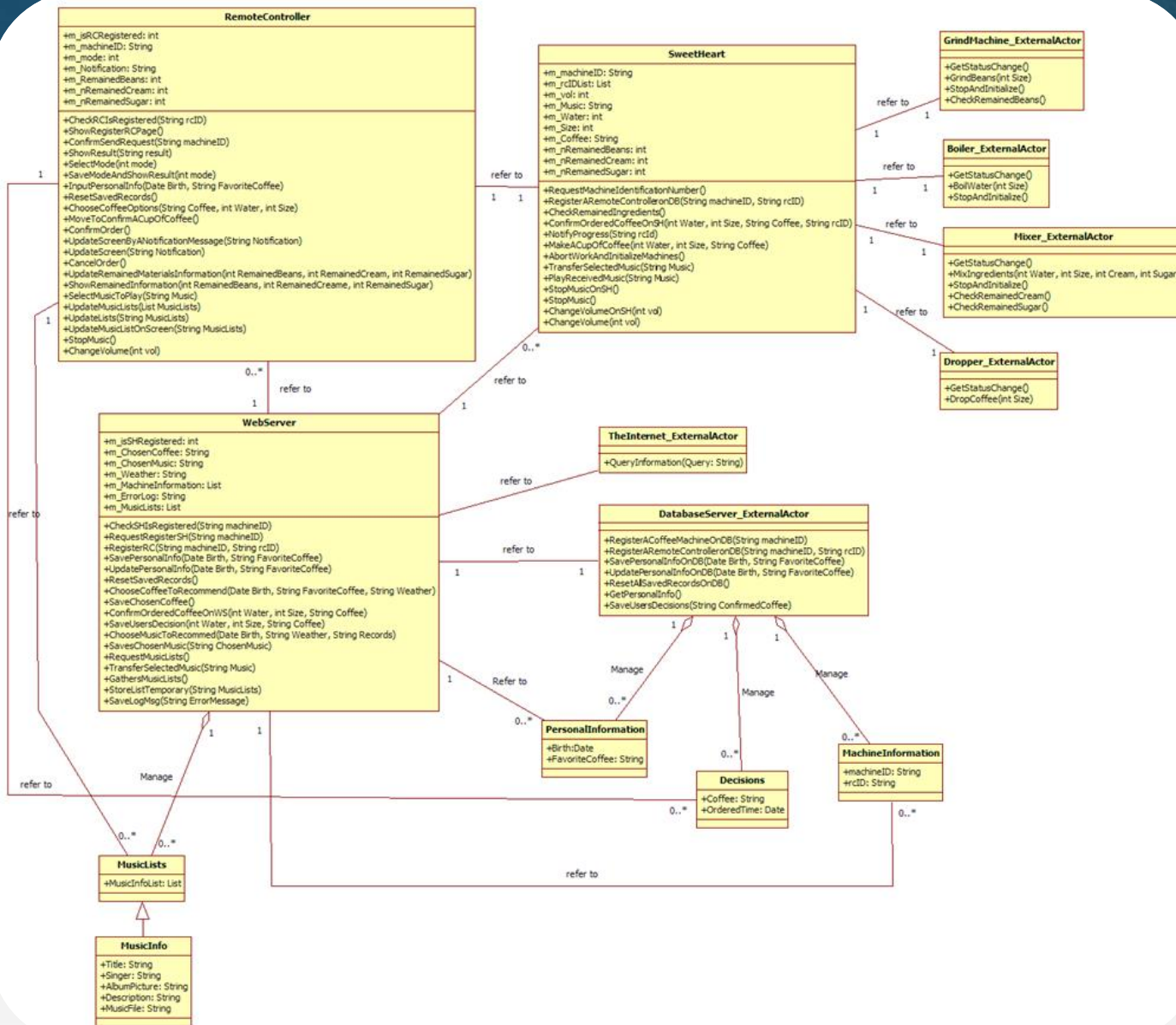
# *Class diagrams*



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# 2145. Define Class Diagrams



# *Database schema*



# 2146. Define Database Schema

## Personal Information

Name	Type
Birth	Date
FavoriteCoffee	String

### Personal Information.

These records stand for saving users' preferences and birth information to recommend a cup of coffee and a music which will be played during the coffee machine is working.

## Decisions

Name	Type
Coffee	String
OrderedCoffee	Date

### Decisions.

These records stand for saving users' decisions such as a ordered coffee to recommend more favorable coffee adaptively.

## MachineInformation

Name	Type
machineID	String
rcID	String

### Personal Information.

These records stand for saving machines' and remote controller's information. The system matches and links the coffee machine and a remote controller by using the records to make a connection between the certain coffee machine and the specific remote controller