OSP Stage 2130

Sweet Heart

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Prep. Revised Plan

- Remove Driving Mode
  - It is reason why this option is not comfortable to user's request
- Redefine Personal Information
  - To extend user's information range
- Redefine Product Registration
  - To make user uses this machine more easily
- Altering names of requirements
  - To clarify meanings of requirements

2131. Define Essential Use Cases

1. Register coffee machine

Element	Description
Use case	Register coffee machine
Actor	Sweet heart itself (the coffee machine)
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 Essential
Cross reference	Functions : R1.1.1 Use Cases : "Register coffee machine" Relaying use cases : "Relay register coffee machine" , "Process register coffee machine"
Pre-requisites	N/A
Typical courses of events	(A) Actor(sweet heart), (W) Web server 1. (A) A sweet heart checks whether it is registered or not when it is turned on automatically when the sweet heart is turned on 2. (A) If it is not registered, a sweet heart sends a request to register itself on the web sever 3. (W) The web server checks whether the requested sweet heart is registered or not. 4. (W) If it is not registered, register it 5. (W) The web server sends the result of the registration process to the sweet heart 6. (A) 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.

2131. Define Essential Use Cases

2. Register controller

Element	Description
Use case	Register 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 Essential
Cross reference	Functions : R1.1.2 Use Cases : "Turn On", "Register Controller" Relaying use cases : "Relay controller registration","Process controller registration"
Pre-requisites	N/A
Typical courses of events	(A) Actor(Owner), (R) Remote Controller, (W) Web server 1. (A) An actor turns on the remote controller 2. (R) When the remote controller is turned on, it checks whether it is registered on the web server or not 3. (R) If it is not registered, it shows a page to the user to get related sweet heart's identification number 4. (A) An actor goes to a sweet heart and gets the sweet heart's identification number via the IR network 5. (A) An actor presses "send button" to send a request to register 6. (W) The web server registers the sweet heart on the database server 7. (W) The web server sends the result of the registration process to the remote controller 8. (R) A remote controller shows received result on the screen
Alternative courses of events	N/A
Exceptional courses	Line 7. If the web server fails to register it, indicate an error

2131. Define Essential Use Cases

3. Receive machine identification number

Element	Description
Use case	Receive machine identification number
Actor	Owner
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 Essential
Cross reference	Functions : R1.1.3 Use Cases : "Send machine identification number", "Receive machine identification number"
Pre-requisites	N/A
Typical courses of events	(A) Actor(Owner), (S) Sweet heart, (R) Remote controller 1.　(A) An actor goes and tries to get sweet heart identification number by using the IR network. 2.　(S) Sweet hearts are always sending IR message contains its identification number without any request. 3.　(R) A remote controller receives the identification number from the sweet heart via IR network. 4.　(R) A remote controller shows received identification number on the screen.
Alternative courses of events	N/A
Exceptional courses of events	N/A

2131. Define Essential Use Cases

4. 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 Essential
Cross reference	Functions : R1.2.1 Use Cases : "Save personal information", Relaying use cases : "Relay save personal information","Process save personal information"
Pre-requisites	The controller should be registered on the web sever before.
Typical courses of events	(A) Actor, (R) Remote controller, (W) Web server 1. (A) An actor inputs personal information on the remote controller 2. (R) A remote controller sends information to the web server 3. (W) The web server saves the information 4. (W) The web server sends the result 5. (R) 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 save the information, indicate an error.

2131. Define Essential Use Cases

5. 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 Essential
Cross reference	Functions : R.1.2.2 Use Cases : "Update personal information", Relaying use-cases : "Relay update personal information","Process update personal information"
Pre-requisites	The controller should be registered on the web sever before.
Typical courses of events	(A) Actor, (R) Remote controller, (W) Web server 1.　(A) An actor inputs personal information on the remote controller 2.　(R) A remote controller sends information to the web server 3.　(W) The web server updates the information 4.　(W) The web server sends the result 5.　(R) 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 save the information, indicate an error.

2131. Define Essential Use Cases

6. 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 Essential
Cross reference	Functions : R1.2.3 Use Cases : "Reset saved record" Relaying use-cases : "Relay reset saved records","Process reset saved records"
Pre-requisites	The controller should be registered on the web sever before.
Typical courses of events	(A) Actor, (R) Remote controller, (W) Web server 1.　(A) An actor presses "Reset saved records" button on the remote controller 2.　(R) A remote controller sends a request to reset all saved records to the web server 3.　(W) The web server deletes all saved records 4.　(W) The web server sends the result 5.　(R) 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.

2131. Define Essential Use Cases

7. Choose coffee to recommend

Element	Description
Use case	Choose coffee to recommend
Actor	Remote Controller
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 Essential
Cross reference	Functions : R1.3.1 Use Cases :, "Choose coffee to recommend" Relaying use-cases : "Turn On", "GetUserDecisions"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Remote controller), (W) Web server 1. (A) If the remote controller is not turned on, the user turns on the remote controller 2. (A) A remote controller sends a request to choose recommended coffee to the web server 3. (W) The web server gets information from the database server 4. (W) The web server chooses coffee to recommend based on various factors such as today's weather, the user's bio-rhythm and previous decisions. 5. (W) The web server saves chosen recommended coffee on the web server
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If the web server has an error during choosing the coffee to recommend, indicate an error.

2131. Define Essential Use Cases

8. Request all menus with recommended coffee

Element	Description
Use case	Request all menus with recommended coffee
Actor	Owner
Purpose	Request all menus with recommended coffee to the user
Overview	Request all available menus with the recommended coffee chosen by use-case number 7.
Type	Primary and Essential
Cross reference	Functions : R1.3.2 Use Cases : "Request all menus with recommended coffee" Relaying use-cases : "Send Menu information"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (W) Web server 1. (A) An actor turns on a remote controller 2. (R) A remote sends a request to the web server in order to get all information about all menus controller with recommended coffee 3. (W) The web server sends requested information 4. (R) A remote controller shows received information, requested before, on the screen.
Alternative courses of events	N/A
Exceptional courses of events	Line 4. If a remote controller fails to receive information from the web server, indicate an error.

2131. Define Essential Use Cases

9. Select size of coffee

Element	Description
Use case	Select size of coffee
Actor	Owner
Purpose	Give an option on size of coffee to users
Overview	Select size of coffee. The size of coffee in this machine should be one of the following list, Short, Tall and Grande.
Type	Primary and Essential
Cross reference	Functions : R1.3.3 Use Cases : "Select size of coffee"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Owner), (R) Remote controller 1. (A) Select size of coffee by pressing the button on the screen in a remote controller 2. (R) A remote controller saves selected size of coffee on the remote controller temporary 3. (R) A remote controller moves on to the next page to select portion of water
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If a remote controller fails to saves selected size of coffee temporary, indicate an error.

2131. Define Essential Use Cases

10. Select portion of water

Element	Description
Use case	Select portion of water
Actor	Owner
Purpose	Give an option on size of coffee to users
Overview	User can increase and decrease based on the default amount of water in the coffee.
Type	Primary and Essential
Cross reference	Functions : R1.3.4 Use Cases : "Select portion of water"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Owner), (R) Remote controller 1. (A) An actor selects portion of water by pressing the button on the screen in a remote controller 2. (R) A remote controller saves selected portion of water on the remote controller temporary 3. (R) A remote controller moves on to the next page to confirm ordered coffee
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If a remote controller fails to saves selected portion of water temporary, indicate an error.

2131. Define Essential Use Cases

11. 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 Essential
Cross reference	Functions : R1.4.1 Use Cases : "Confirm ordered coffee",,"Save user's decision", "Choose music to recommend" Relaying use-cases : "Make ordered coffee"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (W) Web server 1. (A) An actor checks all information on the screen and presses "Confirm" button to order a cup of coffee 2. (R) A remote controller sends a request to the web sever 3. (R) A remote controller sends a request to the sweet heart to order a cup of coffee 4. (W) The web server invokes "Save user's decision" 5. (W) The web server sends a result message to the remote controller 6. (R) A remote controller shows a result from the web server to the user
Alternative courses of events	N/A
Exceptional courses of events	N/A

2131. Define Essential Use Cases

12. 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 Essential
Cross reference	Functions : R1.4.2 Use Cases : "Cancel ordered coffee"
Pre-requisites	This use-case should be issued during the sweet heart is making a cup of coffee
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (S) Sweet heart 1.　(A) An actor presses "Cancel" button on a remote controller 2.　(R) A remote controller sends a request to the sweet heart to cancel ordered coffee. 3.　(R) A remote controller sends a request to the web server to let the server know the ordered coffee is cancelled 4.　(S) The sweet heart sends a result message to the remote controller 5.　(R) A remote controller shows a result to the user
Alternative courses of events	N/A
Exceptional courses of events	N/A

2131. Define Essential Use Cases

13. Show remained materials

Element	Description
Use case	Show remained materials
Actor	Remote Controller
Purpose	Show remained ingredient to let users know what ingredients are needed to
Overview	Show amount of remained ingredients. If one of the ingredient is insufficient, shows the alarm message to the user.
Type	Primary and Essential
Cross reference	Functions : R1.5 Use Cases : "Show remained material", Relaying use-cases : "Request to check remained materials","Send remained materials information"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Remote Controller), (R) Remote controller, (S) Sweet heart 1. (R) A remote controller sends a request to the sweet heart to checks remained ingredients 2. (S) The sweet heart sends a response to the remote controller 3. (R) A remote controller shows the received result
Alternative courses of events	N/A
Exceptional courses of events	N/A

2131. Define Essential Use Cases

14. Show recommended music

Element	Description
Use case	Show recommended music
Actor	Web server
Purpose	Recommend the music for today to make a good atmosphere
Overview	Recommend the music to play during the coffee break.
Type	Primary and Essential
Cross reference	Functions : R1.6.1 Use Cases : "Show recommended music",, "Choose music to recommend", "Confirm ordered coffee" Relaying use-cases : "Send recommended music", "Make ordered coffee"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Web server), (R) Remote controller 1. (A) The web server chooses the recommended music to play 2. (A) The web server sends a message to the remote controller 3. (R) A remote controller shows recommended music received from the web server
Alternative courses of events	N/A
Exceptional courses of events	Line 3. If a remote controller fails to receive appropriate message from the server, indicate an error.

2131. Define Essential Use Cases

15. Select music

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. Lists are shown by genres and generations.
Type	Primary and Essential
Cross reference	Functions : R1.6.2 Use Cases : "Select music" Relaying use-cases : "Send Music List"
Pre-requisites	All registration processes should be done before.
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (W) Web server 1. (A) An actor browses the file by selecting files on the screen of a remote controller 2. (R) If music lists are required (not exist), request the music lists to the web server 3. (W) The web server sends music lists to requested remote controller 4. (R) A remote controller saves current folder and currently selected file temporary on the remote controller.
Alternative courses of events	N/A
Exceptional courses of events	N/A

2131. Define Essential Use Cases

16. Play music

Element	Description
Use case	Play music
Actor	Owner
Purpose	Play selected music in the sweet heart
Overview	Play selected music
Type	Primary and Essential
Cross reference	Functions : R1.6.3 Use Cases : "Play music", "Save user's decision", "Confirm ordered coffee" Relaying use-cases : "Process play selected music", "Send music file"
Pre-requisites	The user should select a music to play before pressing the play button
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (S) Sweet heart, (W) Web server 1. (A) An actor presses "Play" button on the remote controller 2. (R) A remote controller sends a request to the web server to make the sweet heart play a music 3. (W) The web server sends a music file to the sweet heart 4. (W) The web server sends a request to the sweet heart to play a music 5. (W) The web server invokes "Save user's decision" 6. (S) The sweet heart plays received music
Alternative courses of events	N/A
Exceptional courses of events	Line 3. If a remote controller fails to sends a file to the sweet heart, indicate an error. Line 4. If a remote controller fails to sends a request to the sweet heart, indicate an error.

2131. Define Essential Use Cases

17. 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 Essential
Cross reference	Functions : R1.6.4 Use Cases : "Stop music"
Pre-requisites	The sweet heart should be playing a music when this use-case is issued
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (S) Sweet heart 1. (A) An actor presses "Stop" button on the remote controller 2. (R) A remote controller sends a request to the sweet heart to stop the music 3. (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

18. 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 Essential
Cross reference	Functions : R1.6.5 Use Cases : "Change volume"
Pre-requisites	N/A
Typical courses of events	(A) Actor(Owner), (R) Remote controller, (S) Sweet heart 1.　(A) An actor adjusts volume by using a remote controller 2.　(R) A remote controller sends a request to the sweet heart to adjust volume 3.　(S) The sweet heart changes the volume
Alternative courses of events	N/A
Exceptional courses of events	N/A

19. Save user's decision

Element	Description
Use case	Save user's decision
Actor	Web server
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 Essential
Cross reference	Functions : R1.7 Use Cases : "Save user's decision", "Confirm ordered coffee" Relaying use-cases : "Process play selected music"
Pre-requisites	N/A
Typical courses of events	(A) Actor(Web server) 1. (A) The web server saves user's decision on the database server when the user confirms coffee or selects a music to play. 2. (A) If the error occurs, save it to the web server as a log file, to review it later. 3. (A) If the error occurs, send a notification message to the remote controller to let the user know.
Alternative courses of events	N/A
Exceptional courses of events	Line 2. If the error occurs, save it in the web server and send a notification message to the remote controller.
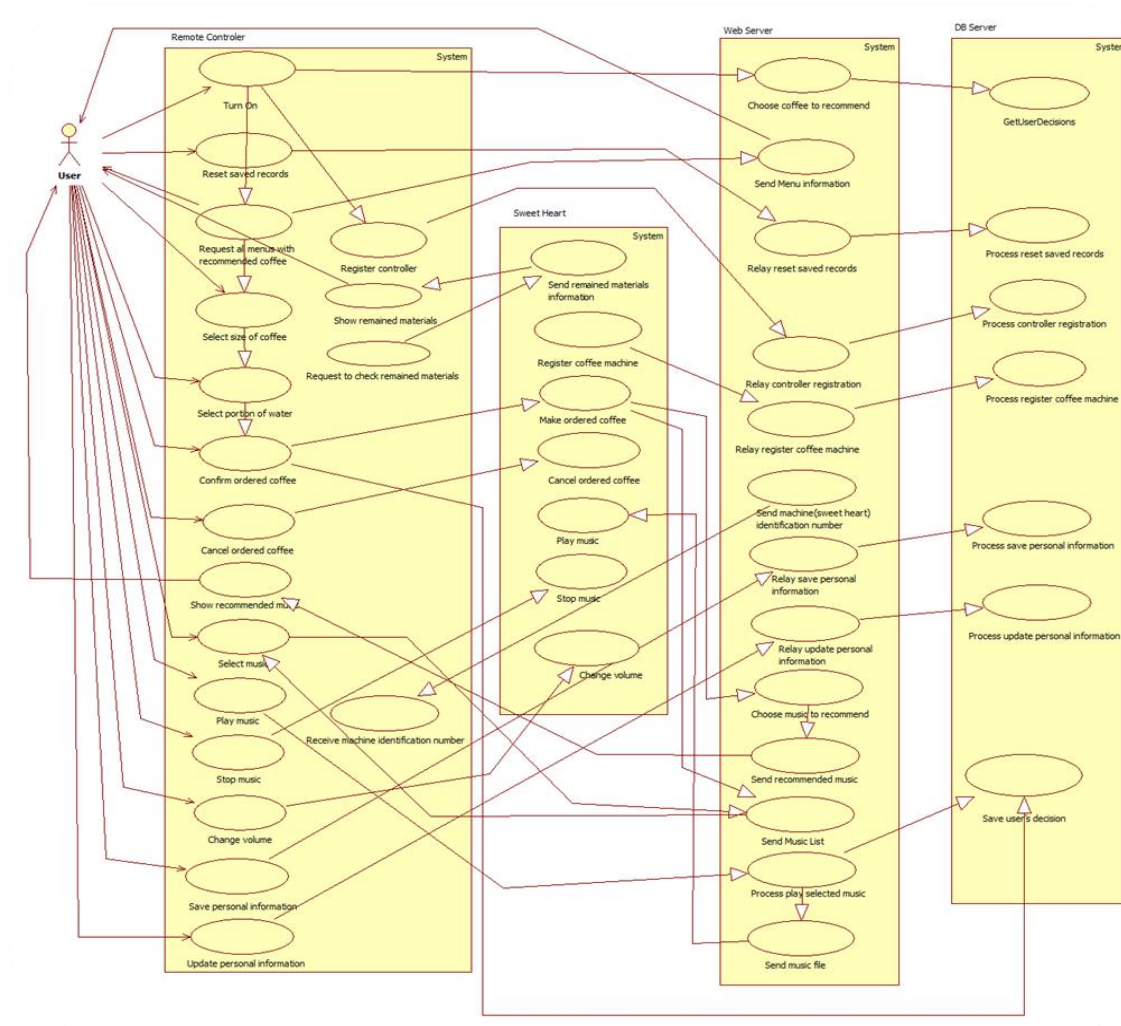
2133. Define Conceptual Model

-Concept Category List

Concept Category	Domain Class
Physical or tangible objects	Sweet heart, remote controller, web server, DB server
Specifications, designs, or descriptions of things	User
Places	N/A
Transactions	Saved decisions
Roles of people	User
Containers of other things	Music, Coffee, User, sweet heart
Things in a container	CoffeeName, size, water, musicname, genre, artist, identification number, name, sex, birth, specialday

2133. Define Conceptual Model

-Identify 'Concepts' in Domain

Sweet heart	Address	Registered sweet heart	Web server
Recommended coffee	volume	Music name	Database server
username	weather	Remained prime	user
Remained beans	Remained cream	Remained milk	Saved decisions
Identification number	Remote controller	music	coffee
genre	artist	Coffee name	size
water	name	sex	birthday

2133. Define Conceptual Model

Assign class names into concepts

Sweet heart	Web server	DB server	Remote Controller
Music	Coffee	User	Saved decision
Registered remote controllers	Registered sweet heart		

2133. Define Conceptual Model

– Identify and add associations
  – Use 'Association Category List'

Association Category	Associations
A is known/logged/recorded/reported/captured in B	Saved decision – Database server
A is a line item of B	Saved decision – Database server User – DB server
A is recorded in B	Saved decision – Database server
A is related to a transaction of B	Remote controller – Web server Remote controller – DB server
A is an organization submit of B	Music – Sweet heart Coffee – Sweet heart

2133. Define Conceptual Model
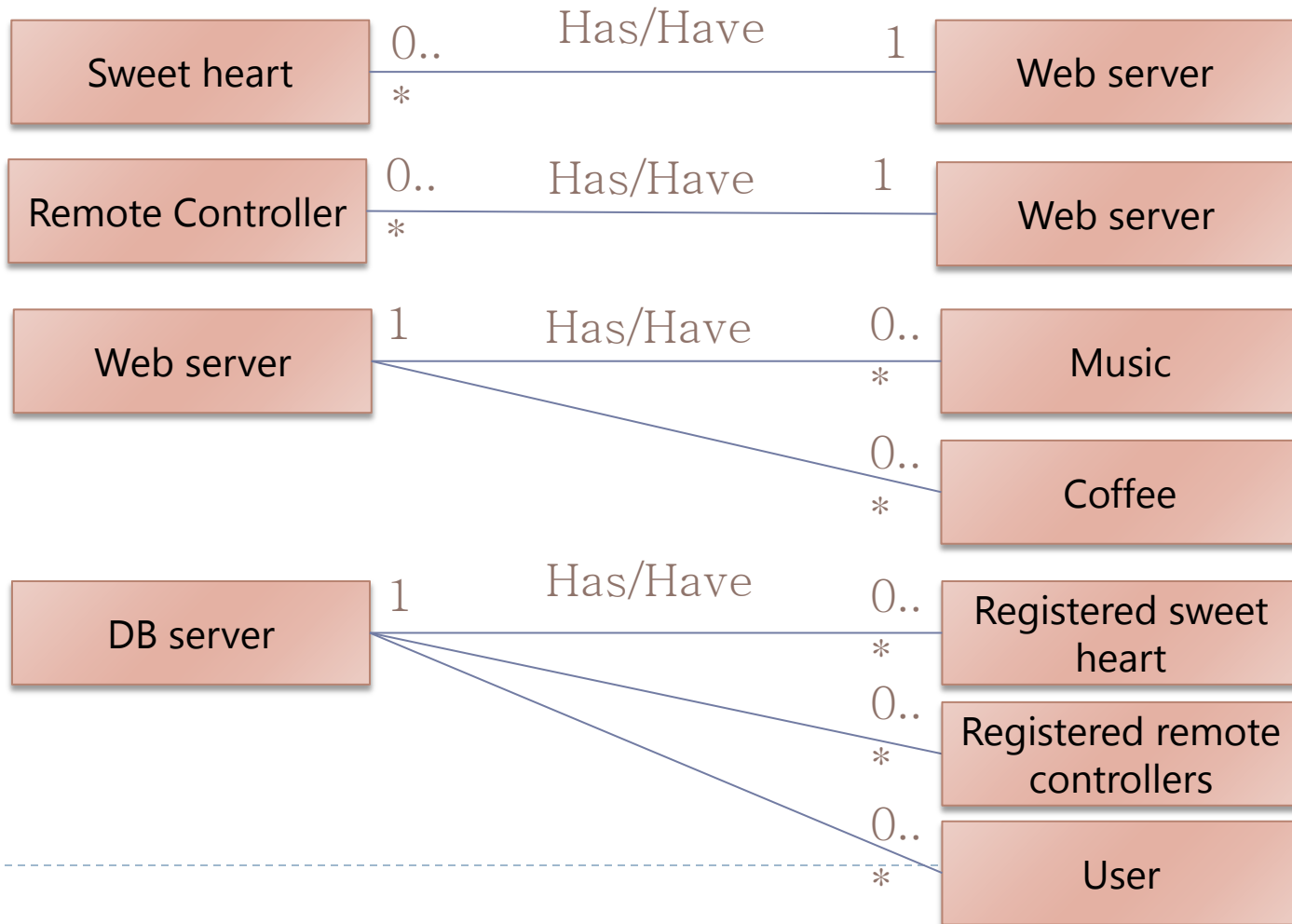
Add Roles and Multiplicity

2133. Define Conceptual Model

Add Roles and Multiplicity

Web server — 1 — Refer to — 1 — DB server

2133. Define Conceptual Model

Attributes

Sweet Heart

+Identification number: integer
+RemainedBeans: Integer
+RemainedCream: Integer
+RemainedMilk: Integer
+RemainedPrime: Integer

Registered Remote Controllers

+Address : String
+UserName : String

Registered Sweet heart

+Identification Number : Integer
+Address : String

Web Server

+weather: string
+recommendedMusic: String
+recommendedCoffee: String
+Volume: Integer

DB Server

User

+name: string
+sex: string
+birth: string
+specialday: string

Music

+musicName:string
+genre:string
+artist:string

Coffee

+coffeeName: string
+size:string
+water:string

Saved decisions

+Selected Coffee: String
+Selected Music: String

Remote Controller

+WebserverAddress: String
+SweetheartAddress: String
+CurrentMusic: String
+SelectedCoffee: String
+SelectedAmountOfCoffee: Integer
+SelectedPortionOfWater: Integer
+UserName: String

2133. Define Conceptual Model
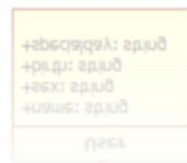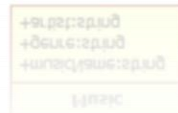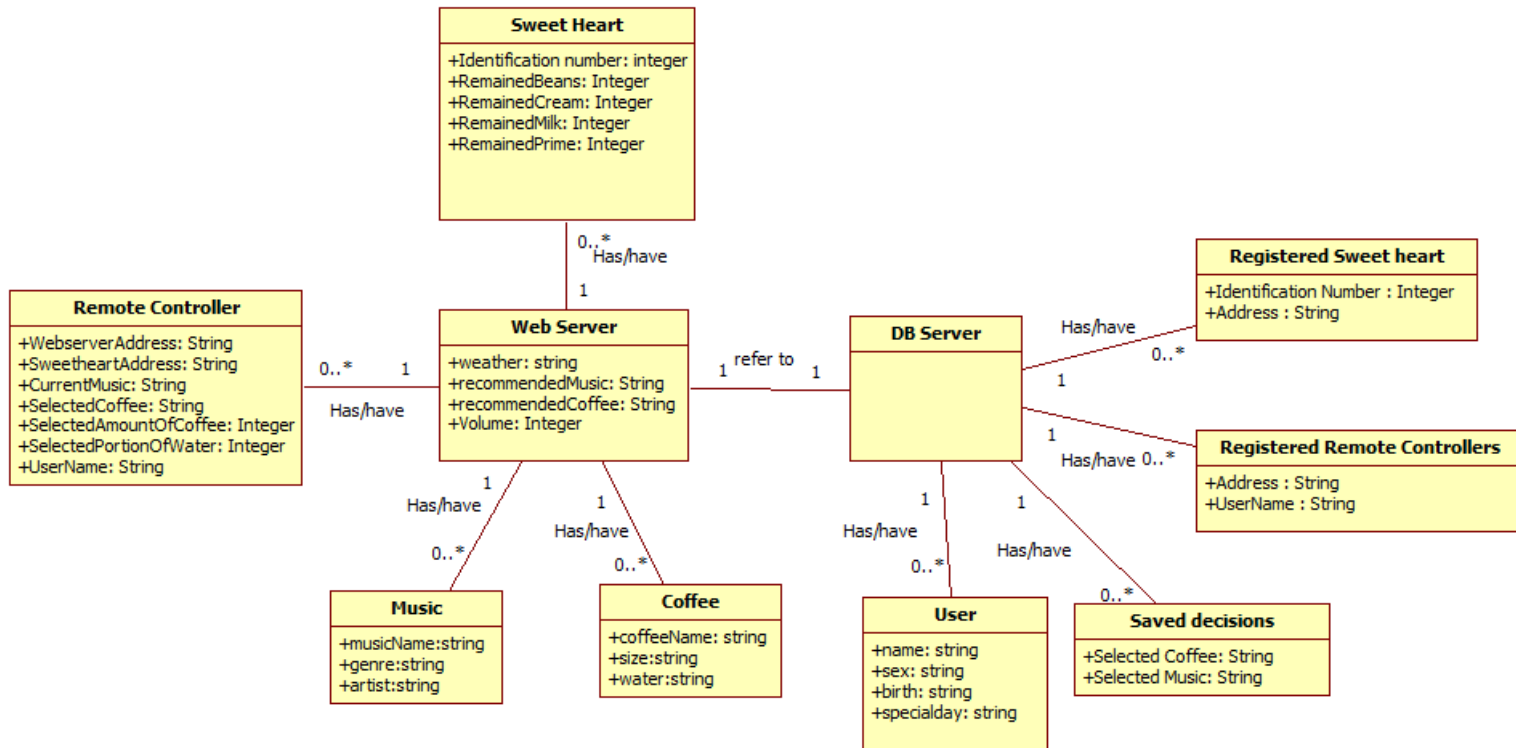
2134. Refine Glossary

Term	Category	Remarks
Sweet heart	Class	The coffee machine
Registered Remote Controllers	Class	Registered information of the remote controller on the web and database server
Registered Sweet heart	Class	Registered information of the sweet heart on the web and database server
Web server	Class	The web server organizes almost everything in this system
DB server	Class	The DB server saves users, remote controllers and sweet hearts information
User	Class	A person who owns the machine and uses this system
Music	Class	Music which will be played on the coffee machine
Coffee	Class	Coffee which will be made by users' commands
Saved decisions	Class	Saved records of users' patterns
Remote controller	Class	The controller which is used by the owner to control the sweet heart

2134. Refine Glossary

Term	Category	Remarks
Sweetheart.IdentificationNumber	Attribute	Identification number which is identical to each sweet heart
Sweetheart.RemainedBeans	Attribute	Information about remained bean in percent
Sweetheart.RemainedCream	Attribute	Information about remained cream in percent
Sweetheart.RemainedMilk	Attribute	Information about remained milk in percent
Sweetheart.RemainedPrime	Attribute	Information about remained prime in percent
RegisteredRemoteControllers.Address	Attribute	An address of the registered remote controller
RegisteredRemoteControllers.UserName	Attribute	An user name of the registered remote controller
RegisteredSweetheart.IndentificationNumber	Attribute	An identification number of the registered sweet heart
RegisteredSweetheart.Address	Attribute	An address of the registered sweet heart

2134. Refine Glossary

Term	Category	Remarks
WebServer.weather	Attribute	Weather information which is originally from the Internet
WebServer.recommendedMusic	Attribute	Recommended music which is selected by the system
WebServer.recommendedCoffee	Attribute	Recommended music which is selected by the system
WebServer.Volume	Attribute	Sound volume of the sweet heart
User.name	Attribute	Registered user name
User.sex	Attribute	Registered user's sex (Male, Female)
User.birth	Attribute	Registered user's birthday
User.specialday	Attribute	Registered user's special day
Music.musicName	Attribute	Title of a music
Music.genre	Attribute	Genre of a music
Music.artist	Attribute	Artist of a music
Coffee.coffeeName	Attribute	A representative coffee name such as Americano
Coffee.size	Attribute	A representative size of coffee such as Tall and Grande
Coffee.water	Attribute	Amount of water of the coffee

2134. Refine Glossary

Term	Category	Remarks
SavedDecisions.SelectedCoffee	Attribute	Record data of user's previous selections on coffee
SavedDecisions.SelectedMusic	Attribute	Record data of user's previous selections on music
RemoteController.WebserverAddress	Attribute	An address of the web server in a remote controller
RemoteController.SweetheartAddress	Attribute	An address of the sweet heart in a remote controller
RemoteController.CurrentMusic	Attribute	Currently selected music information on the remote controller which is temporary stored
RemoteController.SelectedCoffee	Attribute	Currently selected coffee information on the remote controller which is temporary stored
RemoteController.SelectedAmountOfCoffee	Attribute	Currently selected amount of coffee on the remote controller which is temporary stored
RemoteController.SelectedPortionOfWater	Attribute	Currently selected portion of water on the remote controller which is temporary stored
RemoteController.UserName	Attribute	An user name of the user of remote controller

2135. Define System Sequence Diagrams

1. Register coffee machine
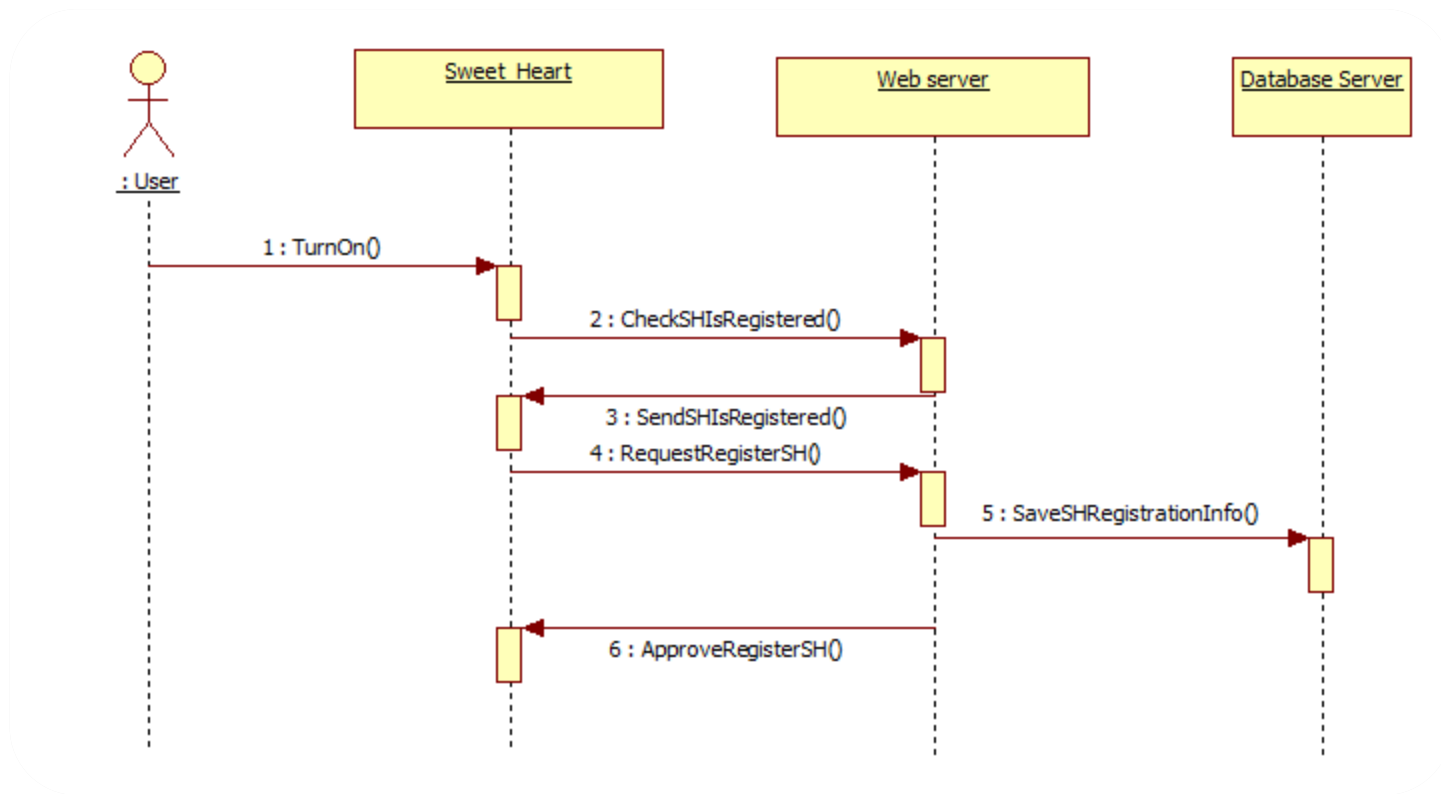
2135. Define System Sequence Diagrams

2. Register controller
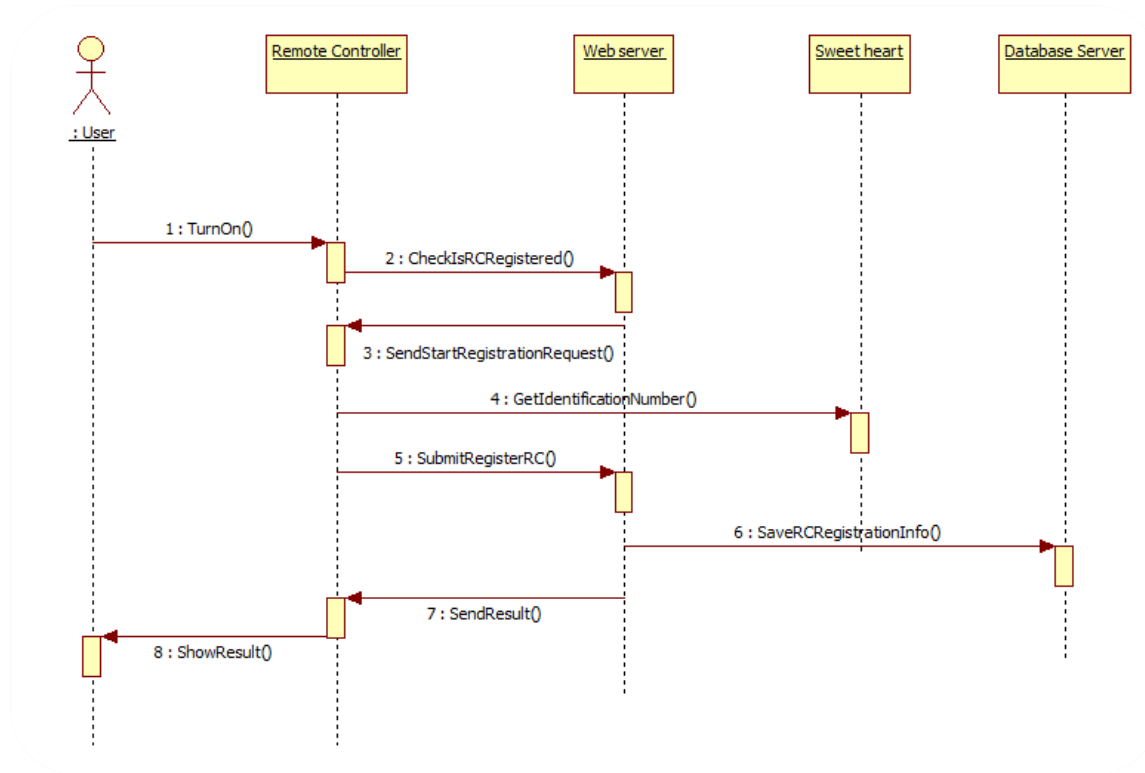
2135. Define System Sequence Diagrams

3. Receive machine identification number
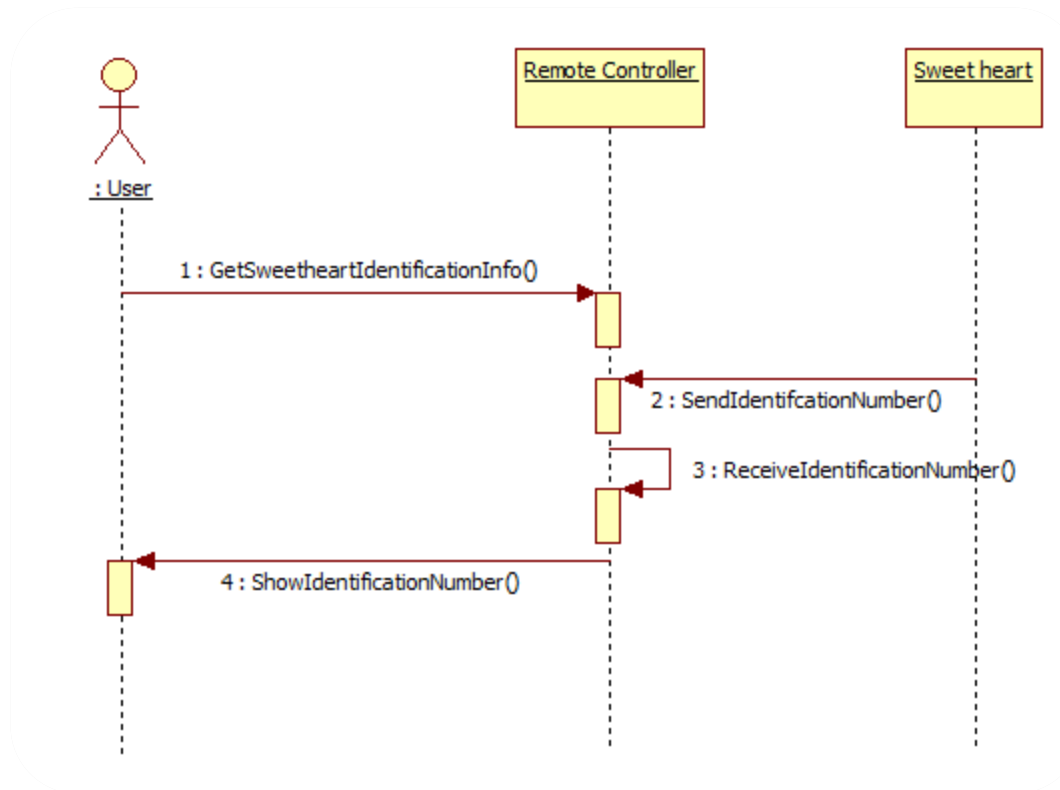
2135. Define System Sequence Diagrams

4. Save personal information
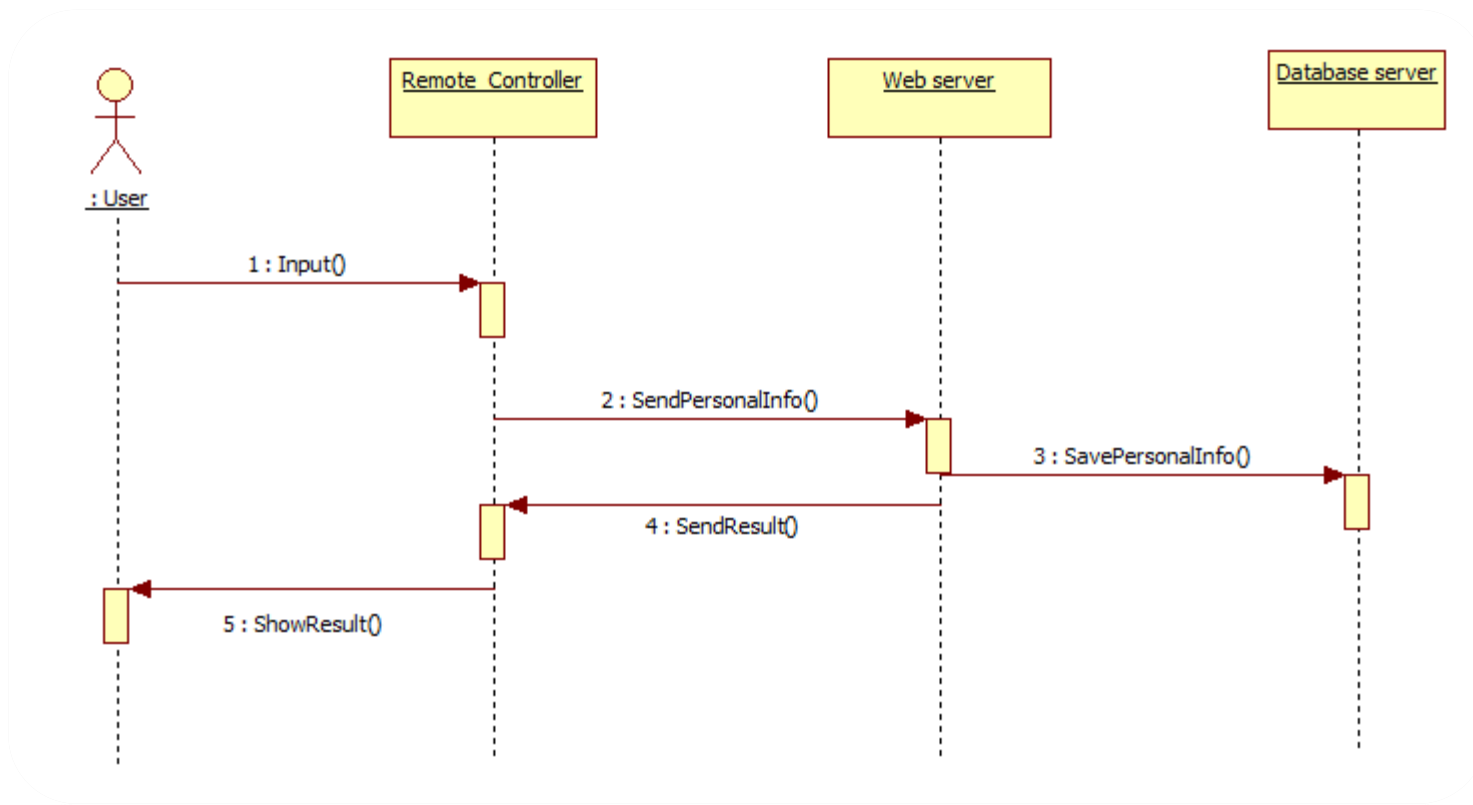
2135. Define System Sequence Diagrams

5. Update personal information
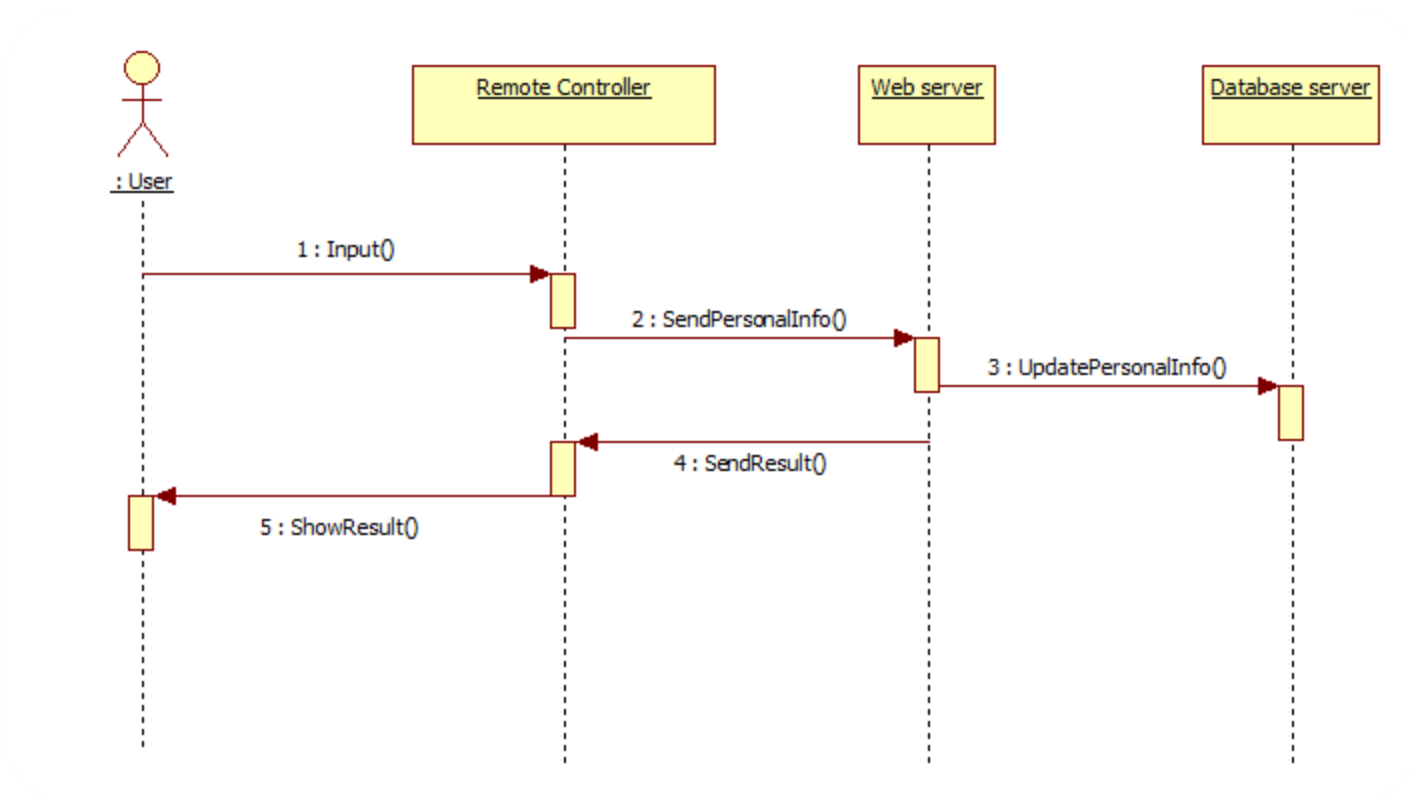
6. Reset saved records
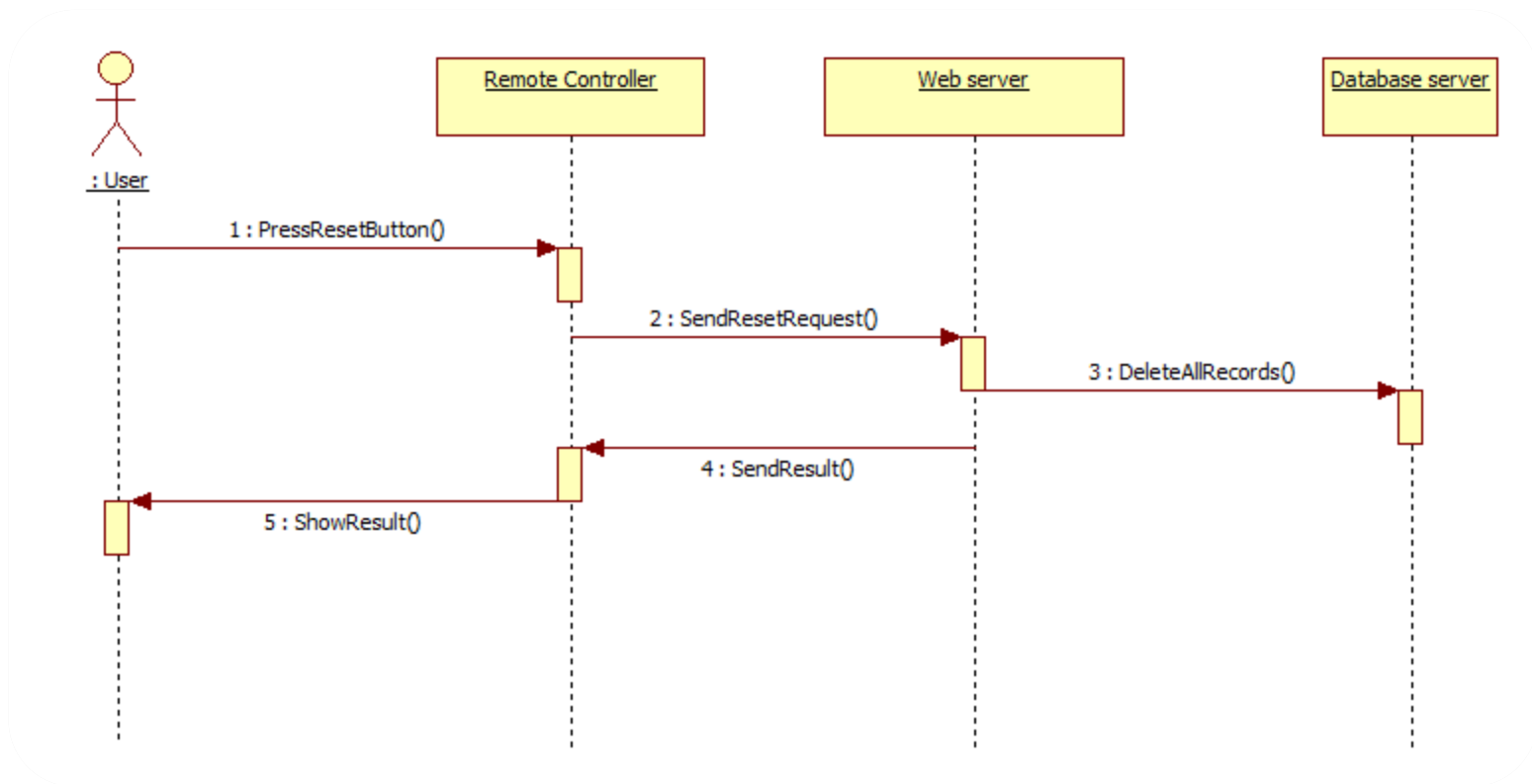
7. Choose coffee to recommend
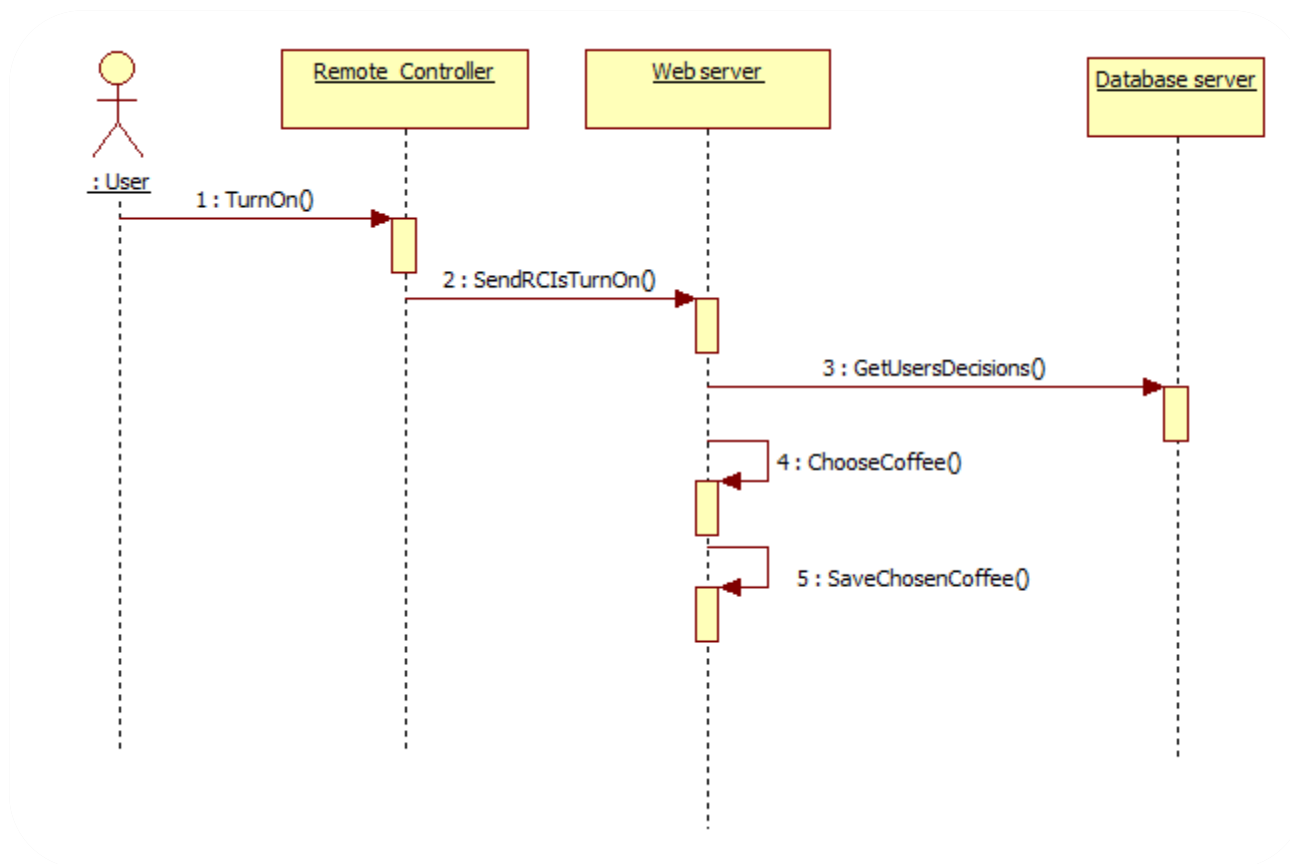
2135. Define System Sequence Diagrams

8. Request all menus with recommended coffee
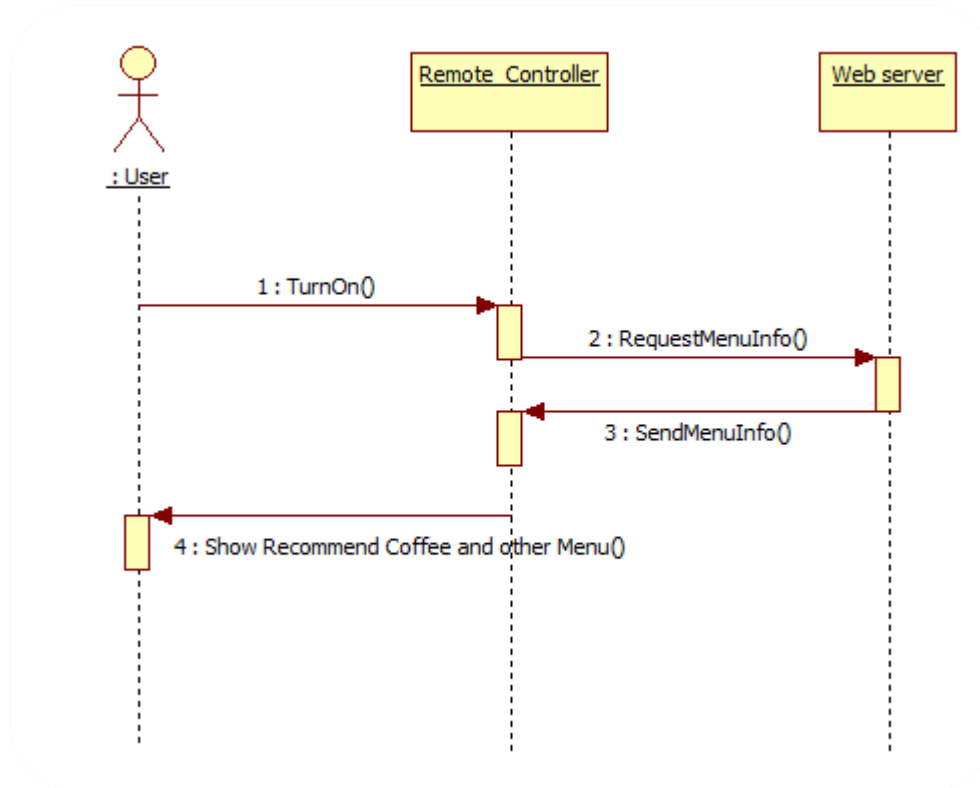
9. Select size of coffee
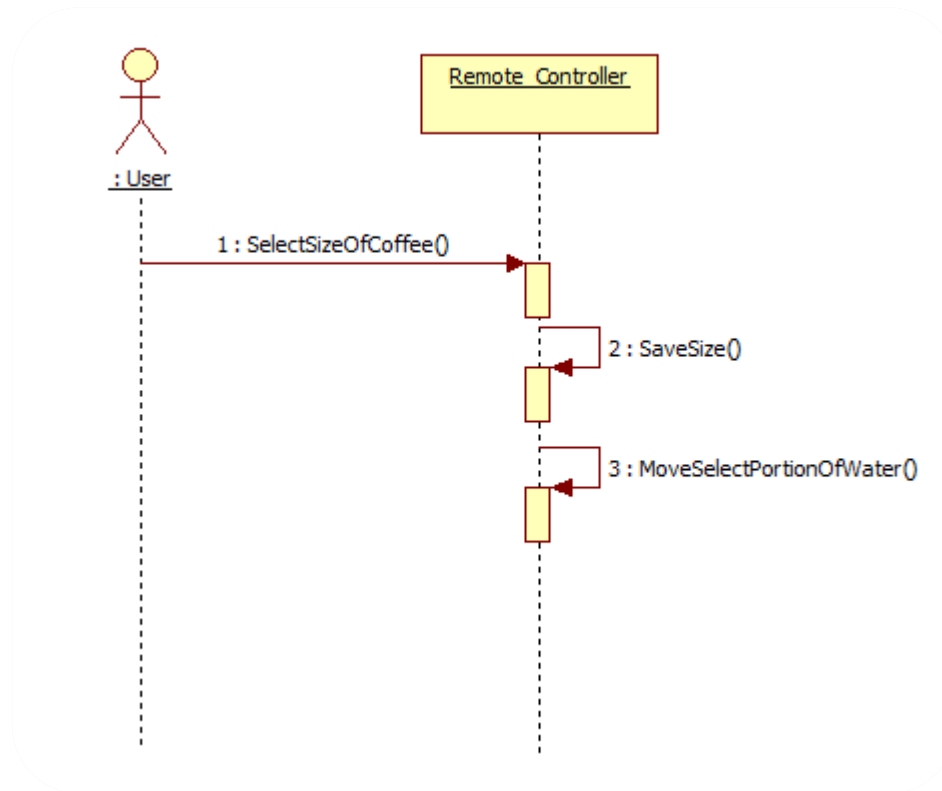
10. Select portion of water
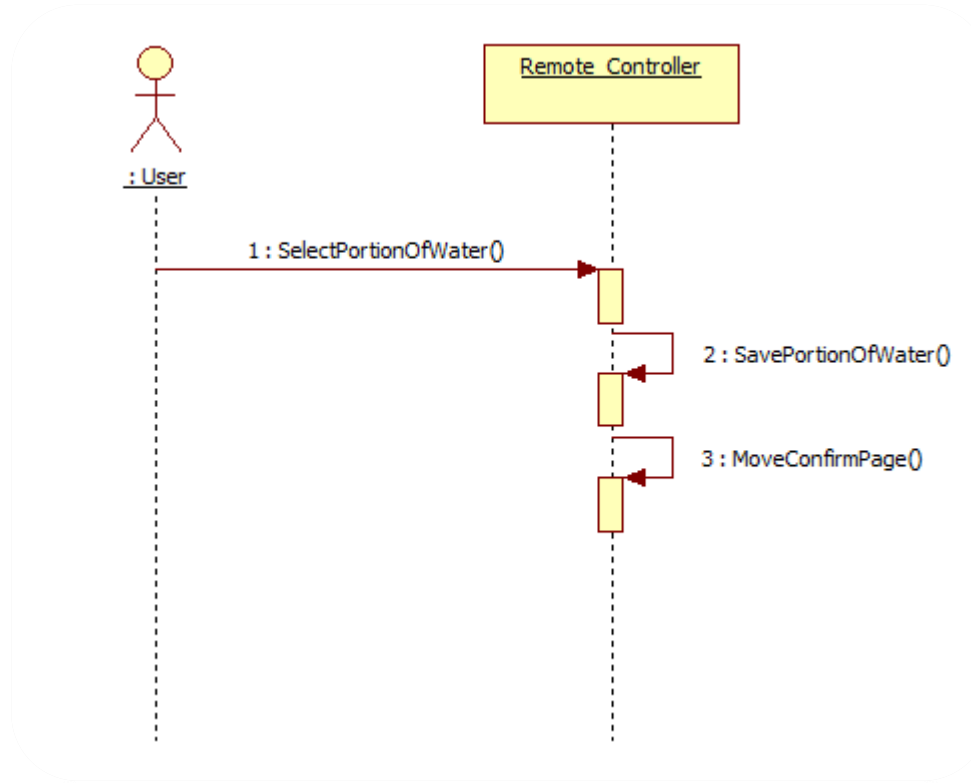
2135. Define System Sequence Diagrams

11. Confirm ordered coffee
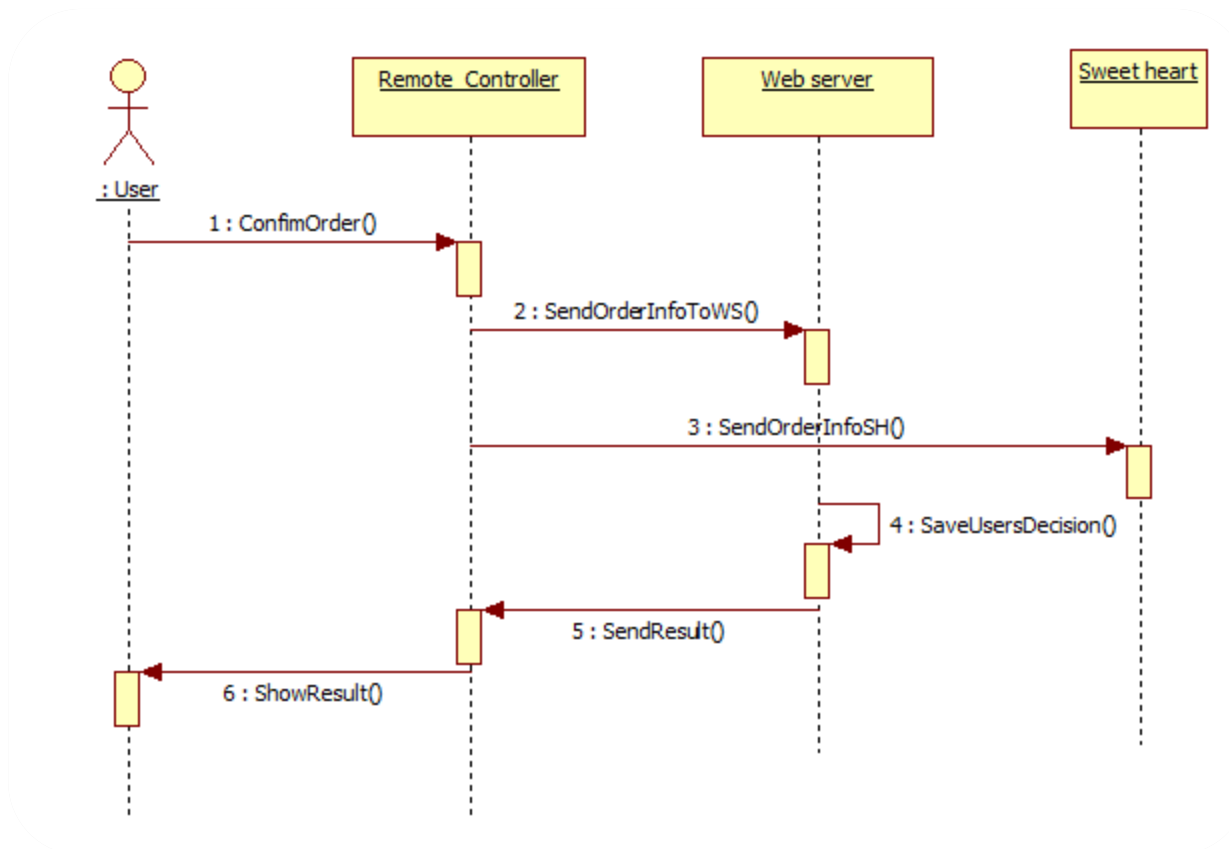
12. Cancel ordered coffee
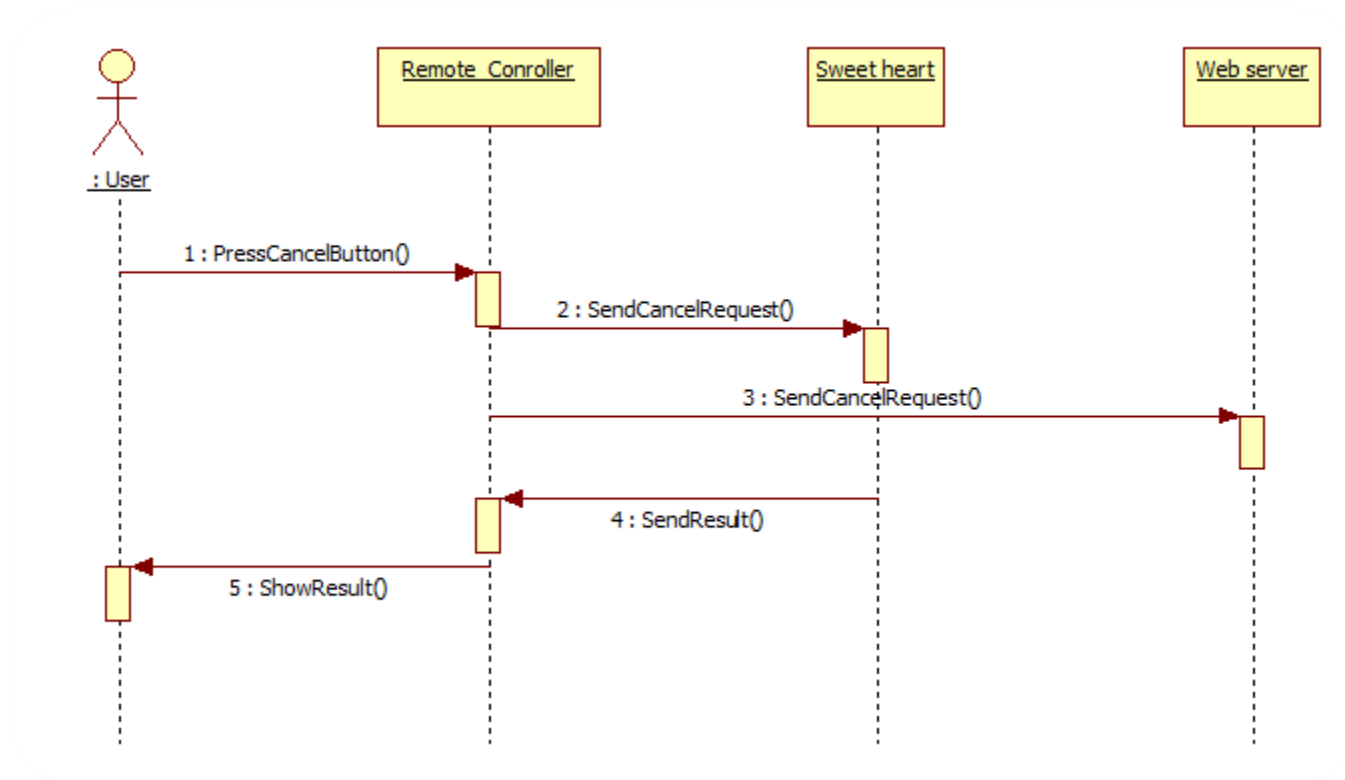
13. Show remained materials
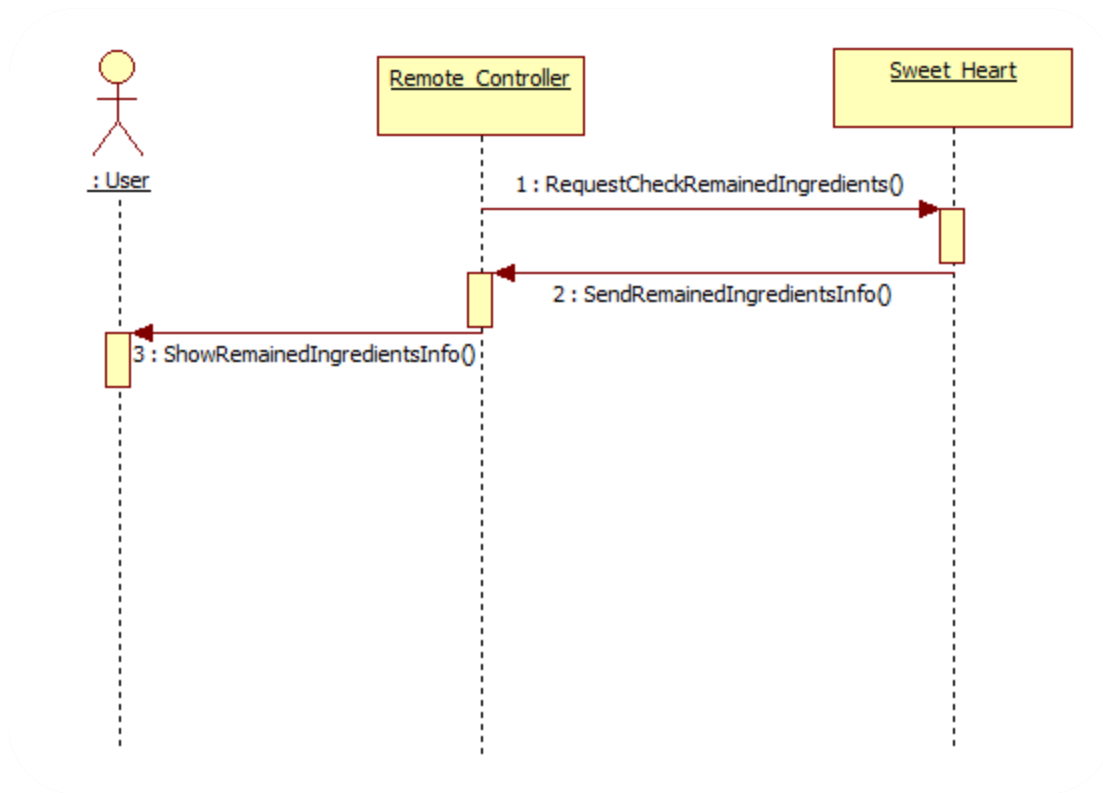
2135. Define System Sequence Diagrams

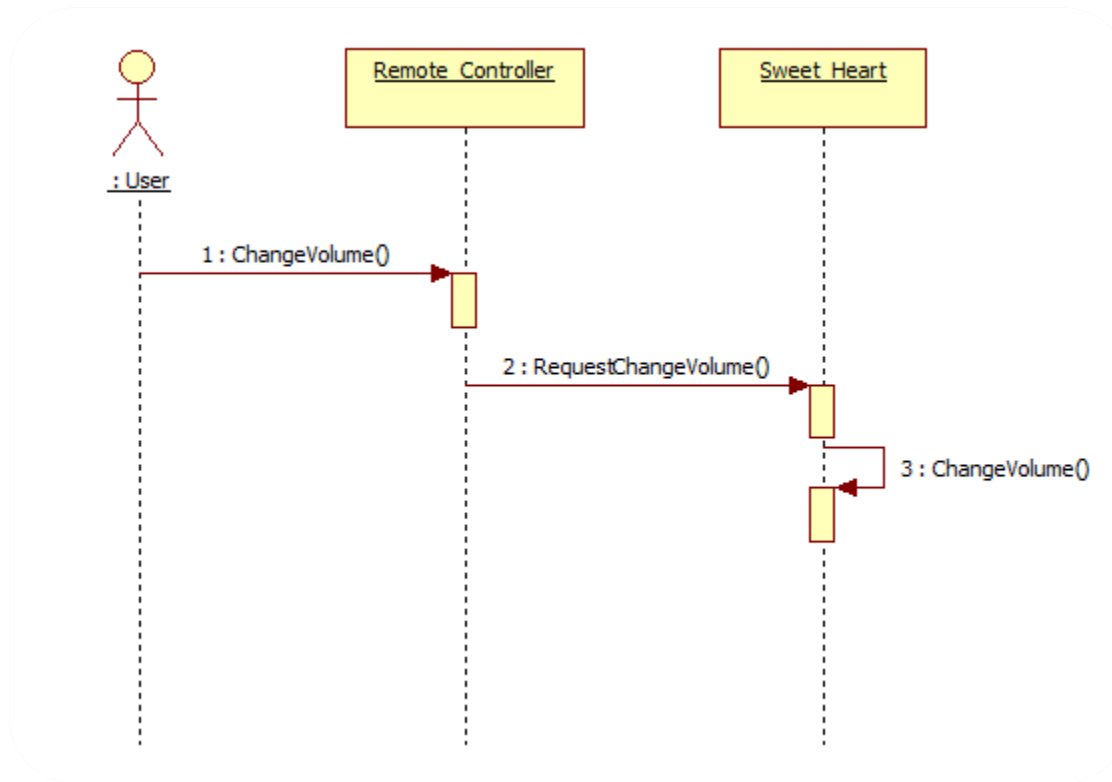14. Show recommended music
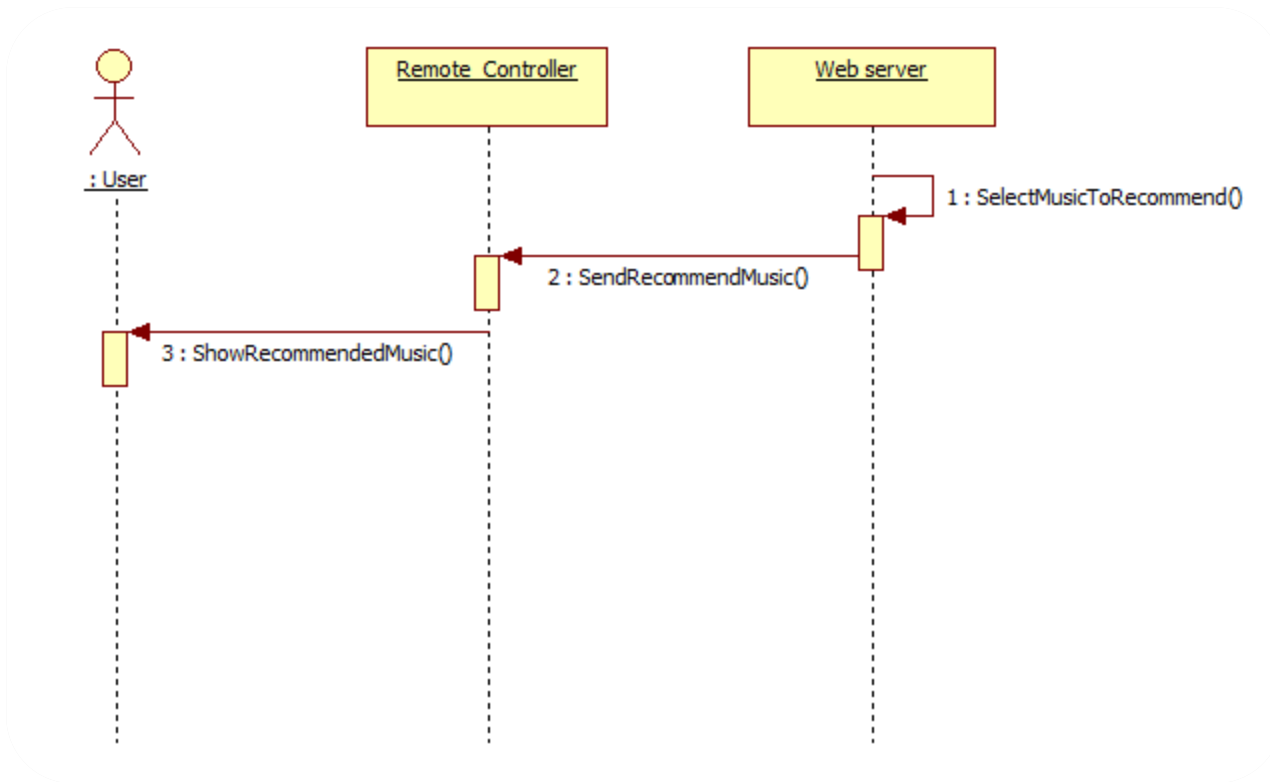
15. Select music
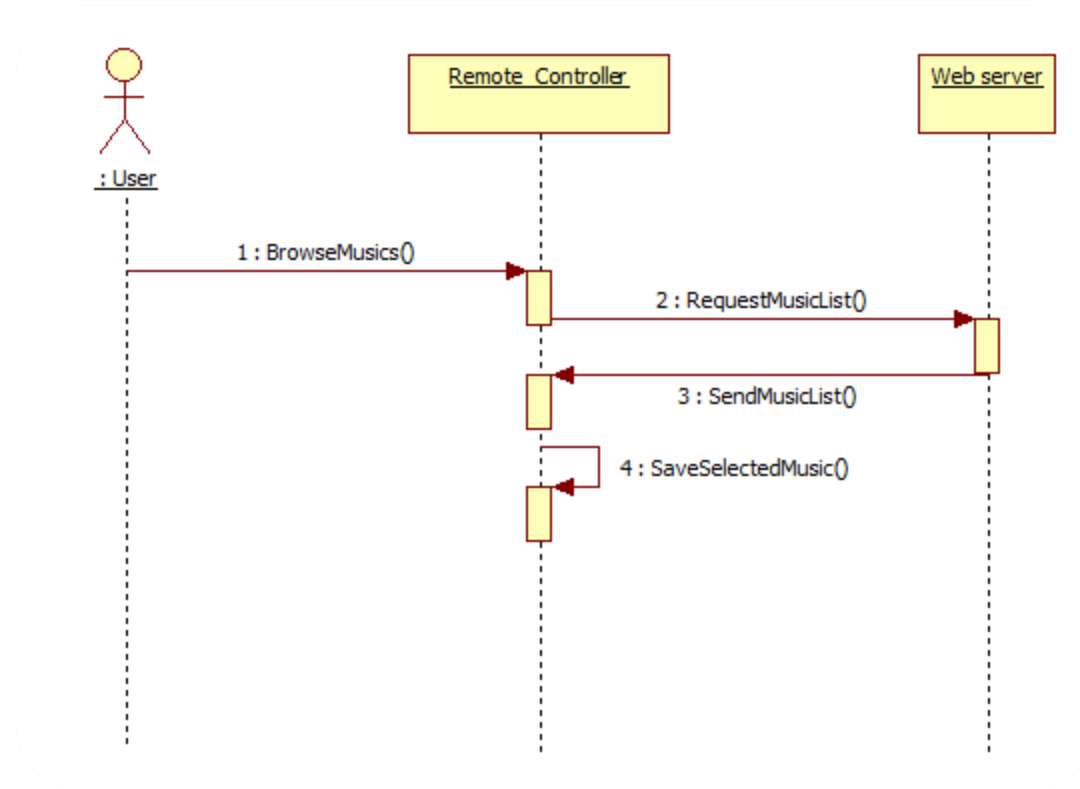
2135. Define System Sequence Diagrams

16. Play music
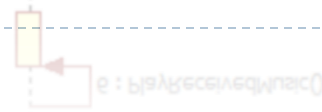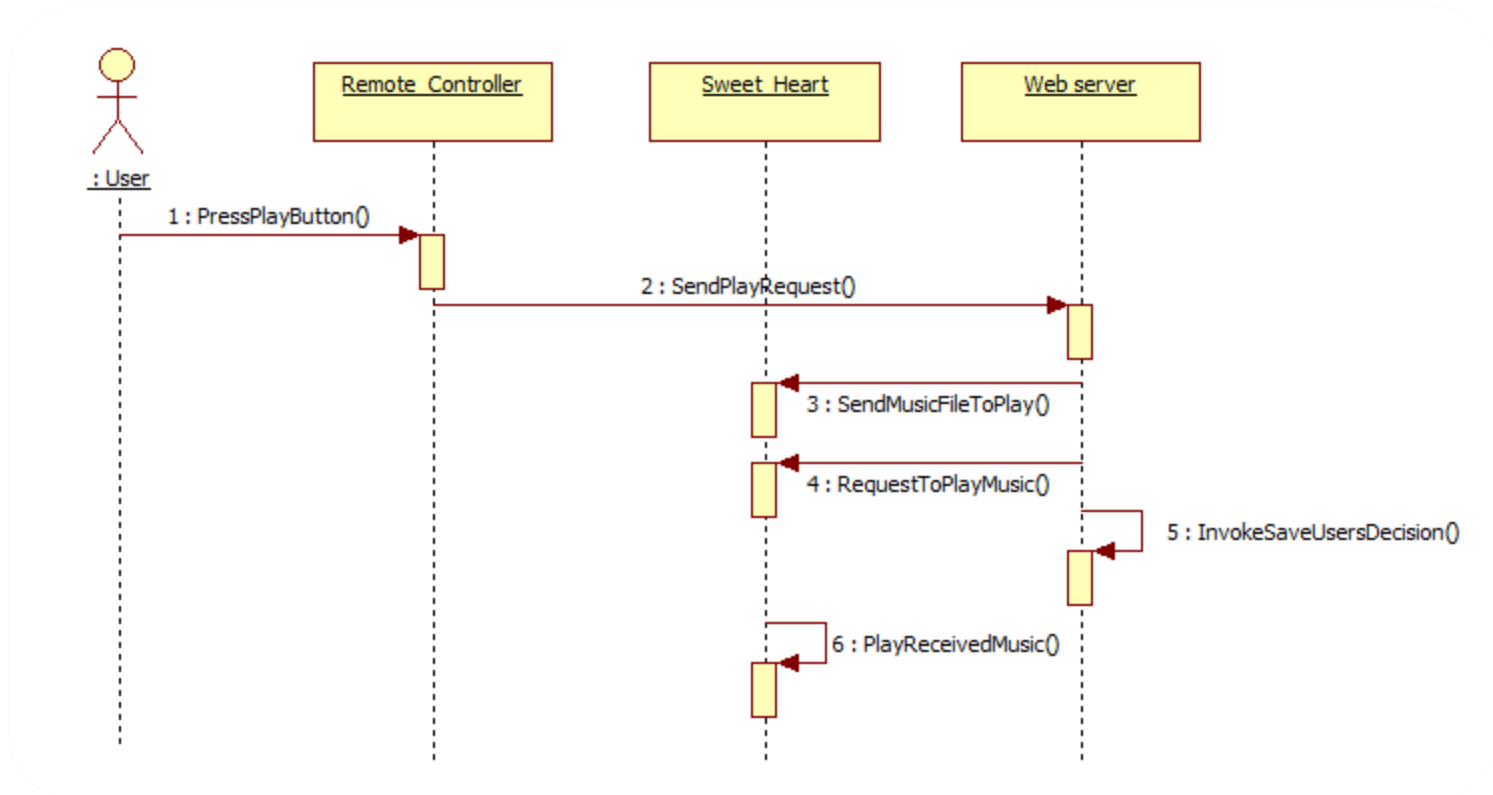
17. Stop music
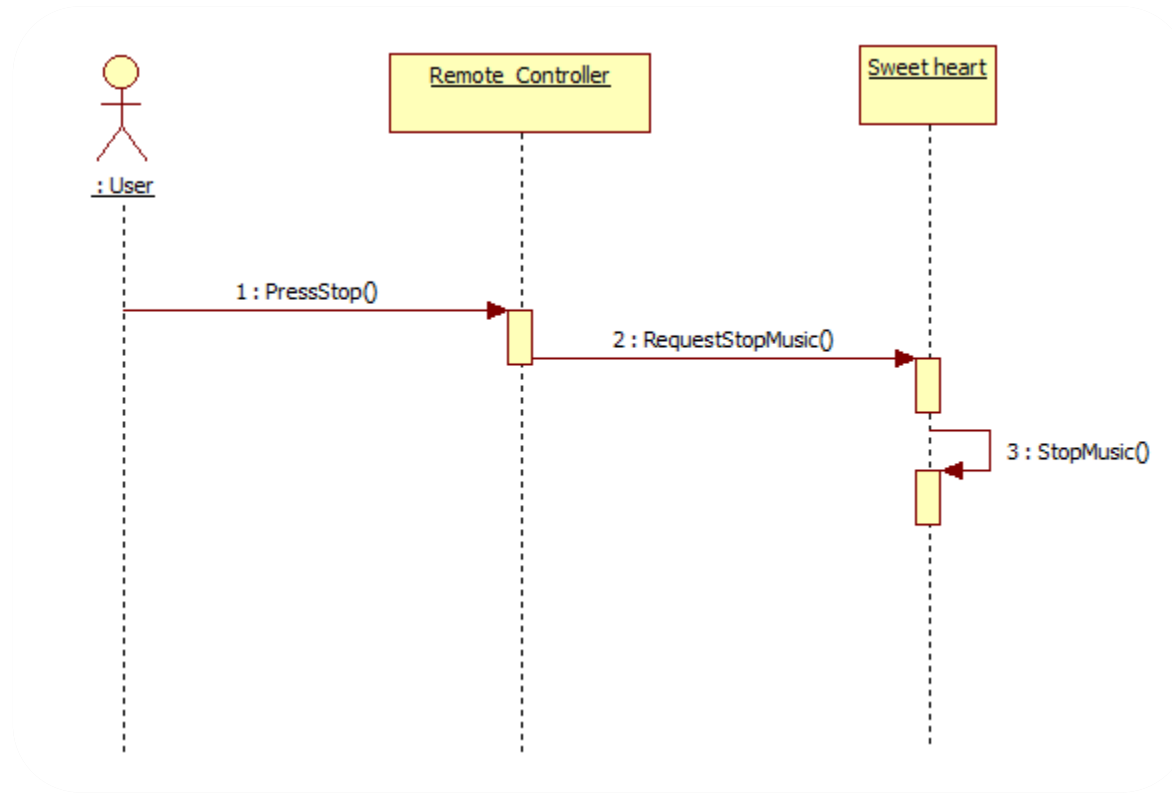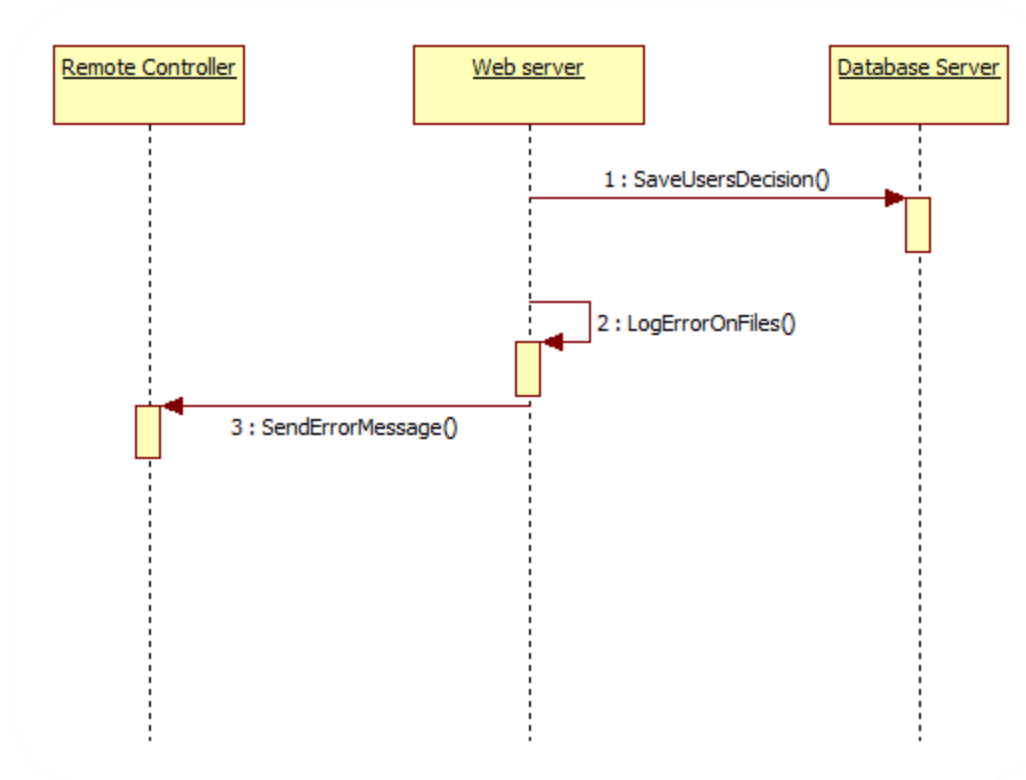
2135. Define System Sequence Diagrams

18. Change volume

2135. Define System Sequence Diagrams

19. Save user's decision

2136. Define Operation Contracts

Use Case	Name of Actor-Activated Event	System Operation
Register coffee machine	None	M_RegisterCoffeeMachine()
Register controller	1: Request register controller()	M_RegisterController()
Receive machine identification number	None	M_ReceiveMachineIdentification Number()
Save personal information	1: Request save personal information()	M_SavePersonalInformation()
Update personal information	1: Request update personal information()	M_UpdatePersonalInformation()
Reset saved records	1: Request reset saved records()	M_ResetSavedRecords()
Choose coffee to recommend	1: Request Choose coffee to recommend()	M_ChooseCoffeeToRecommend()
Request all menus with recommended coffee	None	M_RequestAllMenusWithRecomme ndedCoffee()
Select size of coffee	1: Request Select size of coffee()	M_SelectSizeOfCoffee()

2136. Define Operation Contracts

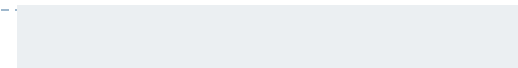| Use Case	Name of Actor-Activated Event	System Operation
Select portion of water	1: Request Select portion of water()	M_**SelectPortionOfWater()**
Confirm ordered coffee	1: Request Confirm ordered coffee()	M_ConfirmOrderedCoffee()
Cancel ordered coffee	1: Request Cancel ordered coffee()	M_CancelOrderedCoffee()
Show remained materials	None	M_ShowRemainedMaterials()
Show recommended music	1: Request Show recommended music()	M_**ShowRecommendedMusic()**
Select music	1: Request Select music()	M_SelectMusic()
Play music	1: Request Play music()	M_**PlayMusic()**
Stop music	1: Request Stop music()	M_StopMusic()
Change volume	1: Change Change volume()	M_ChangeVolume()
Save user's decision	None	M_SaveUsersDecision()

2136. Define Operation Contracts

| Name	M_RegisterCoffeeMachine()
Responsibility	Register coffee machine to the web server to use it in the remote controller
Type	System
Cross References	System Function : R1.1.1
Notes	
Exceptions	An error occurs if networks are not available
Output	N/A
Pre-Conditions	N/A
Post-Conditions	The coffee machine is registered on the web and database server

2136. Define Operation Contracts

Name	M_RegisterController()
Responsibility	Register the remote controller to the web server to authorize it
Type	System
Cross References	System Function : R1.1.2
Notes	
Exceptions	An error occurs if networks are not available
Output	N/A
Pre-Conditions	At least one coffee machine should be registered before
Post-Conditions	The remote controller is registered on the web and database server

2136. Define Operation Contracts

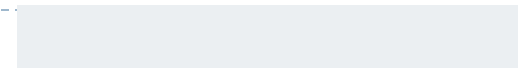| Name	M_ReceiveMachineIdentificationNumber()
Responsibility	Receive the coffee machine's identification number to identify the coffee machine and make a relationship between the coffee machine and the remote controller
Type	System
Cross References	System Function : R1.1.3
Notes	
Exceptions	N/A
Output	Show received machine identification on the screen
Pre-Conditions	The machine is already registered on the web server
Post-Conditions	N/A
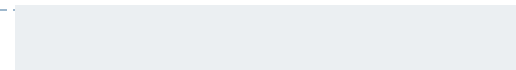
2136. Define Operation Contracts

Name	M_SavePersonalInformation()
Responsibility	Save personal information to use it when the system determine what coffee to recommend or what music to recommend
Type	System
Cross References	System Function : R1.2.1
Notes	
Exceptions	N/A
Output	Show the result of the process
Pre-Conditions	The machine and remote controller is already registered on the web server
Post-Conditions	The personal information is saved on the web and database server

2136. Define Operation Contracts

Name	M_UpdatePersonalInformation()
Responsibility	Update personal information to use it when the system determine what coffee to recommend or what music to recommend
Type	System
Cross References	System Function : R1.2.2
Notes	
Exceptions	N/A
Output	Show the result of the process
Pre-Conditions	The machine and remote controller is already registered on the web server
Post-Conditions	The personal information is updated on the web and database server

2136. Define Operation Contracts

Name	M_ResetSavedRecords()
Responsibility	Delete all users' decisions on the database server
Type	System
Cross References	System Function : R1.2.3
Notes	
Exceptions	N/A
Output	Show the result of the process
Pre-Conditions	The machine and remote controller is already registered on the web server
Post-Conditions	N/A

2136. Define Operation Contracts

Name	M_ChooseCoffeeToRecommend()
Responsibility	Choose coffee to recommend based on previous users' decisions to provide various coffee menus with recommended coffee
Type	System
Cross References	System Function : R1.3.1
Notes	
Exceptions	An error occurs if the database server is not accessible.
Output	N/A
Pre-Conditions	The machine and remote controller is already registered on the web server
Post-Conditions	N/A

2136. Define Operation Contracts

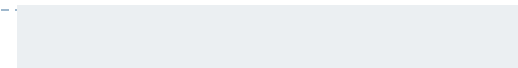| Name	M_RequestAllMenusWithRecommendedCoffee()
Responsibility	Send a request message to gather all information about menus with recommended coffee
Type	System
Cross References	System Function : R1.3.2
Notes	
Exceptions	An error occurs if the database server is not accessible.
Output	N/A
Pre-Conditions	The machine and remote controller is already registered on the web server
Post-Conditions	Show all menus with recommended coffee on the remote controller

2136. Define Operation Contracts

| Name	M_SelectSizeOfCoffee()
Responsibility	Select size of coffee which means amount of coffee such as Grande, Tall and Short.
Type	System
Cross References	System Function : R1.3.3
Notes	
Exceptions	N/A
Output	Show the size the user selected.
Pre-Conditions	The user has been selected the coffee in "Show all menus with recommended coffee"
Post-Conditions	Move on to the "Select portion of water"
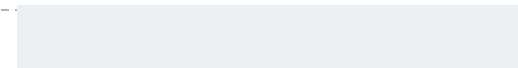
2136. Define Operation Contracts

Name	M_SelectPortionOfWater()
Responsibility	Select portion of water to provide flavor coffee
Type	System
Cross References	System Function : R1.3.4
Notes	
Exceptions	N/A
Output	Show the portion the user selected
Pre-Conditions	The user has been selected the coffee and water in "Show all menus with recommended coffee" and "Select size of coffee"
Post-Conditions	Move on to the "Confirm order"

2136. Define Operation Contracts

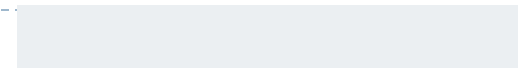| Name	M_ConfirmOrderedCoffee()
Responsibility	Confirm ordered option before starting to make a cup of coffee.
Type	System
Cross References	System Function : R1.4.1
Notes	
Exceptions	Warn the user if ingredients are insufficient
Output	Show the result and process about making coffee
Pre-Conditions	All options have been selected by the user
Post-Conditions	Make the system to enable "cancel ordered coffee" command Make coffee successfully
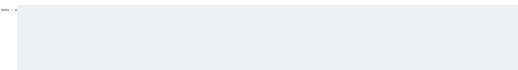
2136. Define Operation Contracts

| Name	M_CancelOrderedCoffee()
Responsibility	Cancelling ordered coffee can be available even if the coffee is currently making When cancel command has been executed, the system returns to the initial state.
Type	System
Cross References	System Function : R1.4.2
Notes	
Exceptions	An error occurs if the web server is not accessible.
Output	Show the result of the command which is a cancelling command.
Pre-Conditions	The coffee is currently making
Post-Conditions	Return to the initial state which is "Show all menus with recommended coffee" menu.

2136. Define Operation Contracts

| Name	M_ShowRemainedMaterials()
Responsibility	Remained materials should be observable
Type	System
Cross References	System Function : R1.5
Notes	
Exceptions	N/A
Output	Check remained materials and show it on the screen
Pre-Conditions	The machine and remote controller is already registered on the web server
Post_Conditions	If there is insufficient ingredient, show the alarm on the screen or let the user know by beep sound.

2136. Define Operation Contracts

Name	M_ShowRecommendedMusic()
Responsibility	Retrieving recommended music from the web server
Type	System
Cross References	System Function : R1.6.1
Notes	
Exceptions	An error occurs if the web server is not accessible.
Output	Show recommended music on the remote controller
Pre-Conditions	The coffee should be ordered before
Post_conditions	Move on to the "Select music"
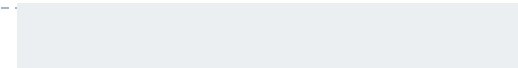
2136. Define Operation Contracts

Name	M_SelectMusic()
Responsibility	The user can be able to select the music on the remote controller
Type	System
Cross References	System Function : R1.6.2
Notes	
Exceptions	An error occurs if the web server is not accessible.
Output	N/A
Pre-Conditions	A remote controller should be received music lists from the web server before
Post-Conditions	Move on to the "Play music"
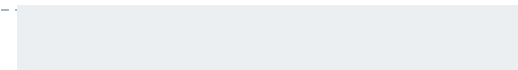
2136. Define Operation Contracts

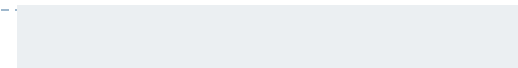| Name	M_PlayMusic()
Responsibility	Play the music selected in "Select Music"
Type	System
Cross References	System Function : R1.6.3
Notes	
Exceptions	N/A
Output	The selected music is played on the coffee machine
Pre-Conditions	The music should be selected before
Post-Conditions	Show the result of the process

2136. Define Operation Contracts

| Name	M_StopMusic()
Responsibility	The music now playing should be stoppable when the user issued the stop command
Type	System
Cross References	System Function : R1.6.4
Notes	
Exceptions	N/A
Output	The music is stopped
Pre-Conditions	The music should be playing before
Post-Conditions	The system changes its mode to play it again

2136. Define Operation Contracts

Name	M_ChangeVolume()
Responsibility	The volume can be adjustable
Type	System
Cross References	System Function : R1.6.5
Notes	
Exceptions	N/A
Output	The volume is changed
Pre-Conditions	A remote controller should be received music lists from the web server before
Post_conditions	The volume can be shown on the remote controller

2136. Define Operation Contracts

Name	M_SaveUsersDecision()
Responsibility	Save users' decisions on the database server when some important decisions happened
Type	System
Cross References	System Function : R1.7
Notes	
Exceptions	An error occurs if the database is not accessible.
Output	N/A
Pre-Conditions	The machine and remote controller is already registered on the web server. Also, the database has been installed and successfully initialized by the administrator.
Post-Conditions	N/A
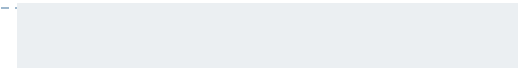
Q & A

▸ Thanks you for your attentions