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Assignment 2

Voicemail System

**---------- Functional Specification ----------**

Summary:

This is a voicemail system that does:

* Lets a person dial an extension number. An input line consisting of a single character 1 . . . 9 or # denotes a pressed button on the telephone touchpad
* Connects the call to the extension
* Provided the other party does not pick up the telephone, the caller leaves a message
* The other party can later retrieve the messages
* The other party can later keep the messages
* The other party can later delete the messages

Point of view of the caller:

The caller has the options to:

* When the caller calls the main number, he will be asked to dial an extension or hang-up
* The caller dials an extension and is connected to that extensions. If the owner of the extension does not pickup, the caller will be directed to voicemail
* The caller can then hang-up or leave a 30 second message. The caller can leave a shorter message by hanging up after leaving the message.

Point of view of the owner:

* The owner calls the main number and dials his extension
* He will be asked to enter a password or wait to leave a message
* He will enter the correct password. If it is incorrect, he repeats the above steps
* Then the messages in the mailbox are played. He will have the option to delete the message or keep them.
* Then the owner may hang-up after any message is played or he may listen to all the messages before the system hangs up.

**---------- User Manual ----------**

Dialing the main number of the system will initialize it. You first will hear a greeting and some options. Then you can enter the extension you wish to reach or hang up (enter 3 numbers from 0 to 9 and end with a #). If you dial a valid extension, you will be connected to that extension. If the owner of the extension is available, he will pick up and you can converse with him. If he is not available, you will be led to voicemail. At voicemail, you will hear some options and can leave a message after the “beep.” The message can be at max 30 seconds long or you may shorten it by hanging-up. If you enter a password after the voicemail options message (enter 3 numbers from 0 to 9 and end with a #), you will have access to your voicemail mailbox and will be given the options to delete a message by pressing 0, hang-up by pressing H, or listen to the messages in the queue. You may hang-up after a message is played or delete it by pressing 0. The system will automatically hang-up after all the messages in the mailbox are played.

**---------- Use Cases ----------**

The caller calls the number of the system from the “main” worldwide telephone system (method). The system would start playing the caller’s options and wait for an input.

**Use Case: Invalid input or inactivity**

If the input is invalid (letters, symbols, length larger than 3), the system would ask for another input or ask to enter H to hang-up. If the user takes too long to enter the next key, which is 3 seconds, the call is automatically disconnected.

**Use Case: Valid input**

After a valid input, the system would then search and connect the caller to the correct extension and call it. The user may pick up the phone and the system hangs-up after the call.

**Use Case: The extension owner is not available to pickup**

If the extension owner is not available to pick up the call, the caller would be led to voicemail. Then the user will hear more options, such as to enter a password or wait for the “bleep” to leave a message. These two cases will be discussed in the following paragraphs.

**Use Case: The user enters the correct password**

If the user enters a password, he will be played a message stating his options: press 0 to delete a message or do nothing to keep it, press H to hang-up. After this intro message is played, the user can enter 0, H, or nothing after each message in the mailbox is played. A message will be played, and the user will have 3 seconds to decide to delete the message or hang-up. If he clicks something other than that or clicks nothing, the next message will be played and the process repeats. The system automatically hangs-up after playing all the messages in the mailbox.

**Use Case: The user enters a wrong password or waits**

If the user enters a wrong password or does not enter anything, he will be allowed to leave a message in the mailbox. A “beep” will be played. The caller has 30 seconds to leave a message. The caller can press H during his message to end his message if he wishes not to speak for 30 seconds. If he does so, the message is ended and saved before hanging up. After leaving a message, the call is hung-up, and the system is exited.

**---------- Functions ----------**

Nouns/Objects:

* Mailbox: A queue of messages. You can retrieve messages, add them to queue, or delete them
* Message: Stores a message
* Extension: simulates a phone line and contains a mailbox. Caller can “call” an extension
* Passcode: A sequence of integers

**VoicemailSystem**

initiateCall() – Starts the voice mail system

* Used to start the voice mail and call system. Started when somebody calls the main number
* The user would be played a greeting - playGreeting()
* The user would be allowed to enter an extension number – pushButton()
* The extension number returned by pushButton() would be checked and connected. If H was entered, the call would be disconnected – call() or hangUp()

playGreeting() – Plays a greeting

* A greeting message will be played, stating all the options the user has such as press H to hang-up and dial an extension after this message

pushButton() – Gets the keypad input of the caller

* Symbols entered on the keypad are saved in a variable. After every press, the pressed symbol is appended to the variable
* After every press, the caller has 3 seconds to enter the next key. Otherwise, the system will automatically hang-up due to inactivity.
* If (#) of (H) is entered, the voice mail system stops taking input and return to the caller
* If any other symbol or letter is entered, the user is prompted to reenter the extension number or H - invalidExt()
* The caller may enter a maximum of 3 numeric symbols followed by the (#) symbol on the telephone pad. This would mean that there could be a maximum of 999 password combinations/mailboxes in the voice mail system which is sufficient.
* If the caller enters more than 3 symbols, all the symbols are erased from the system. The user is prompted to reenter an extension number or H - invalidExt()
* If the caller enters a valid input, the input is returned to the caller function

invalidExt() – Plays a message if user enters an invalid extension

* Plays a message stating that the extension is invalid and tells the user to enter a new extension followed by a # symbol or H

call() – calls the correct extension specified by the input

* Searches the directory of valid extensions – searchExt()
* Caller “calls” the extension – pickup() is are located in the “Extension” object
* If the extension owner picks up, caller may speak to him – speak()
* If the “Extension” does not pick-up, caller would be lead to voicemail – voicemail()

speak()

* If the extension owner picks up, caller may speak to him

searchExt() – searches the entered extension for existence and returns it

* Searches the directory of valid extensions and returns that extension

hangUp() – hangs up the call and exits the system

* Disconnects the call/ exists the program

voicemail() – executes the voicemail protocol

* The user will be played a message stating his options – voicemailOptions()
* The system would wait for a password - pushButton()
* If a password was entered, it would be checked - checkPswd()
* If the password is incorrect or was not entered, a “beep” would be played – playBeep()
* The system then would let the user to leave a message or hang-up – leaveMessage()

voicemailOptions() – Plays the voicemail options

* Plays a message stating that if you are the user, enter your passcode or wait for the “beep” to leave a message

playBeep() – Plays a “beep” for voicemail

* Plays the message “Beep”

leaveMessage() – Adds a message to mailbox

* The caller has 30 seconds to leave a message
* The input of the user is continuously saved for the duration for the message
* The message will end if H is pressed or 30 seconds have passed
* The system will then save the message – it will access the mailbox’s add method
* The system will then hang-up – hangUp()

checkPswd() – Checks the entered password with mailbox password

* The system compares the entered password to the actual password of the system
* If the entered password is correct, the user would be played his messages – retrieveMessage()

retrieveMessage() – Plays the messages in mailbox

* The user will first be played a message mentioning his options
* The user will be played the queue of messages in the mailbox
* After playing a single message, the system waits for an input – pushButton()
* If the user enters 0, the message is deleted – deleteMessage()
* Otherwise, the message is kept
* After playing all the messages, the system will automatically hang-up – hangUp()

mailboxOptions() – Plays the mailbox options

* A message will be played telling the user to press 0 followed by a # to delete and H to hang-up after a message is played

deleteMessage() – deletes a message in mailbox

* This method will delete the message from the mailbox queue by accessing the methods of the mailbox

**Mailbox**

addMessage() – adds a message to the mailbox queue

deleteMessage() – deletes a message in the mailbox queue

playMessage() – plays a message

**Message**

getMessage() – returns a message  
setMessage() – stores a message

**Password**

getPassword() – Returns the password

setPassword() – sets the password

**Extension**

setExtensionNumber() – sets the number of the extension

getMailbox() – returns its mailbox

isPickup() – returns true if the owner picks up the phone and false if not