



SEN2212

Data Structure and Algorithms II Project Report

Group No: 12

Project Title: software management for pharmacies

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1. Introduction

1.1 Purpose/Project Proposal

The 20th century has seen considerable advances in many technical fields and artificial intelligence, which have contributed to a rise in all fields. Our project is related to the health field. It will advance the life standard for both patients and pharmacists. Our aim of the software management is to allow pharmacist to have a full recode of the patient, which gives them fixable access to her/his history. After investigation, we have noticed problems that pharmacists deal with daily; we aim to limit those hassles, so the pharmacist can make decisions more accurately and more effectively, in a shorter time, and without making fallacies.

Our project is software for pharmacies when a pharmacist can log in and save the data of the patient in the system and that information will be reachable to all employees working in that pharmacy.

1.2 Software Language/ Project Environment

This project is developed using JAVA programming language in eclipse IDE. We built our GUI interface by using WindowBulider

1.3 Data Structures

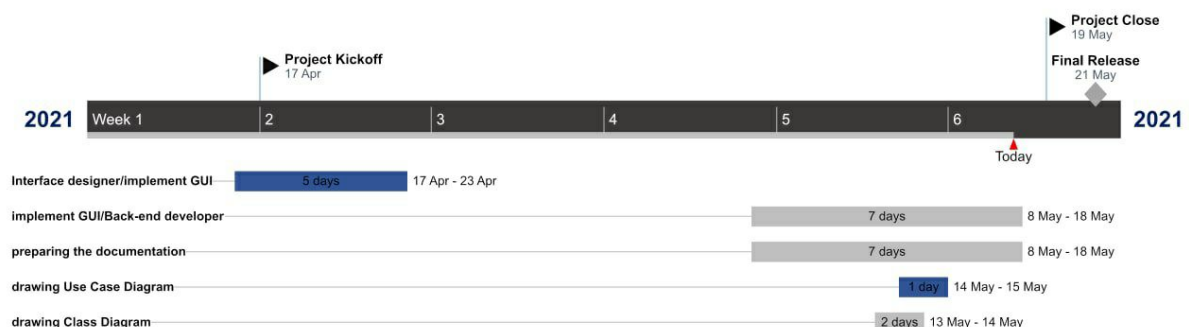
In our project, we have three objects (pharmacy, employee, and patient).

We wanted to connect each employee to the pharmacy he/ she working at, therefore, we chose to link them by using Linked list data structure. We decided to use this data structure because of its time complexity, linked list has $O(1)$ time complexity for insertion and deletion, on the other hand, array has $O(n)$ time for insertion and deletion. Moreover, stack and queue would not serve our purpose even though it has the same time complexity as linked list.

Additionally, we wanted to connect patient's information to pharmacy; therefore, we chose to link them by using LinkedHashMap. The reasons for choosing this data structure that it provides an easy way to maintain the insertion order, its time complexity $O(1)$ for insertion and deletion, It contains only unique elements, and it is the same as HashMap with the additional feature that it maintains insertion order.

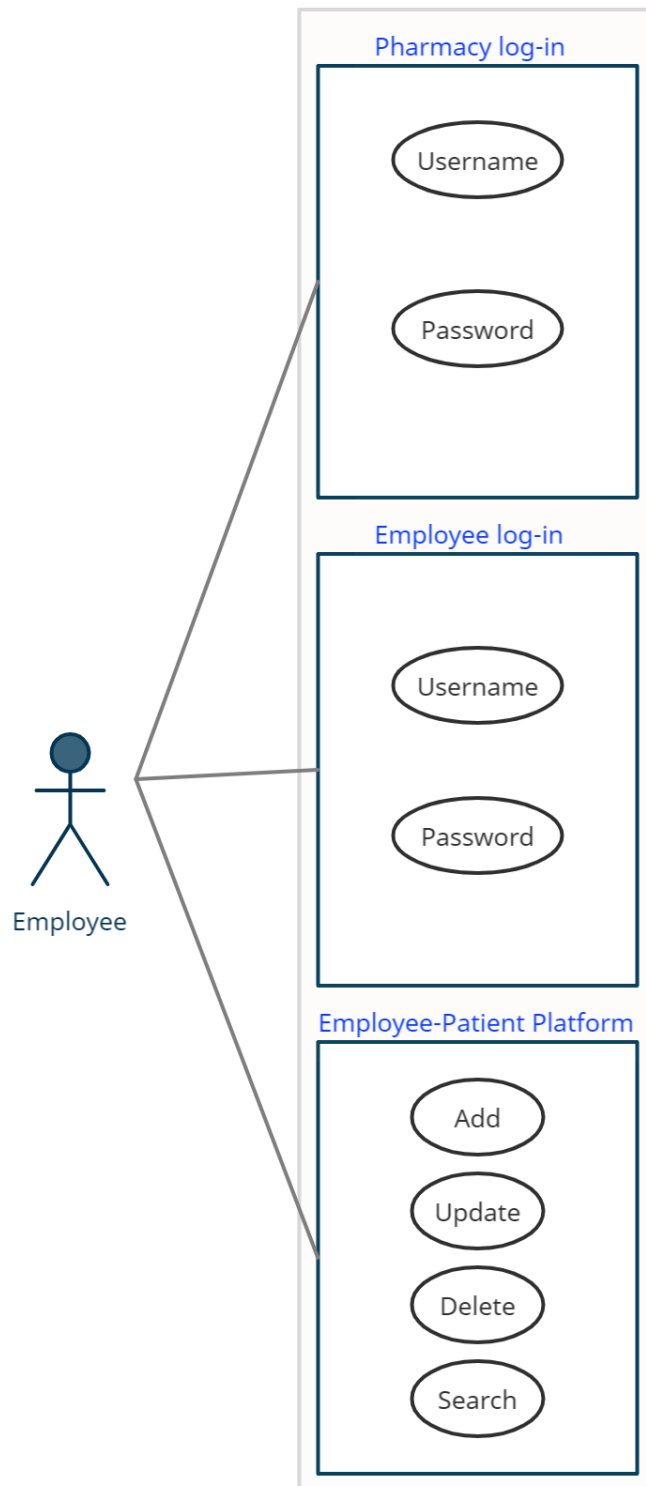
1.4 Work Partitioning

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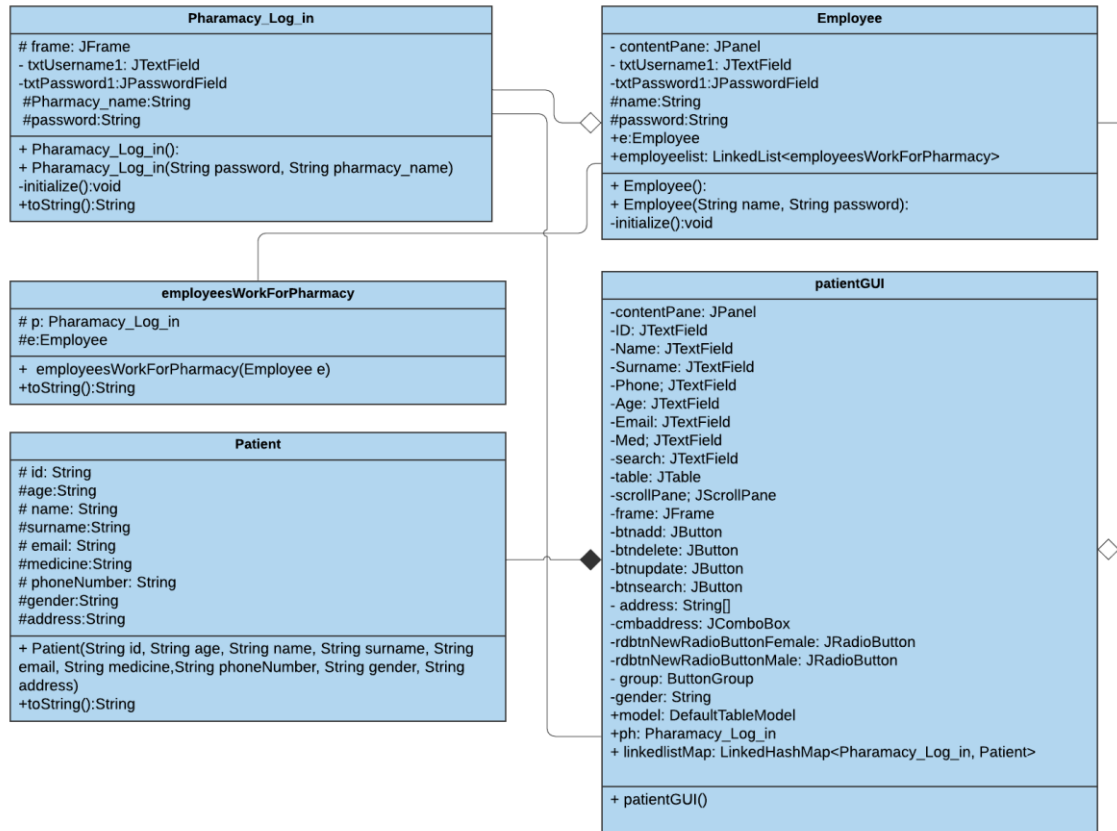


2. Architectural Representation

2.1 Use Case Diagram



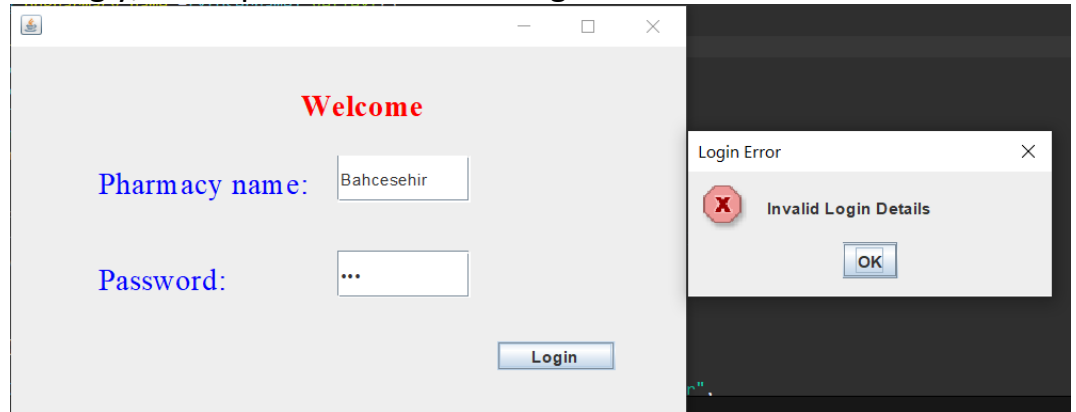
2.2 Class Diagram



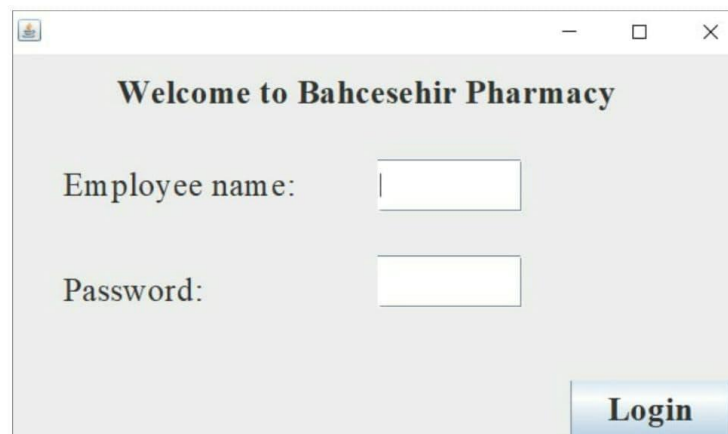
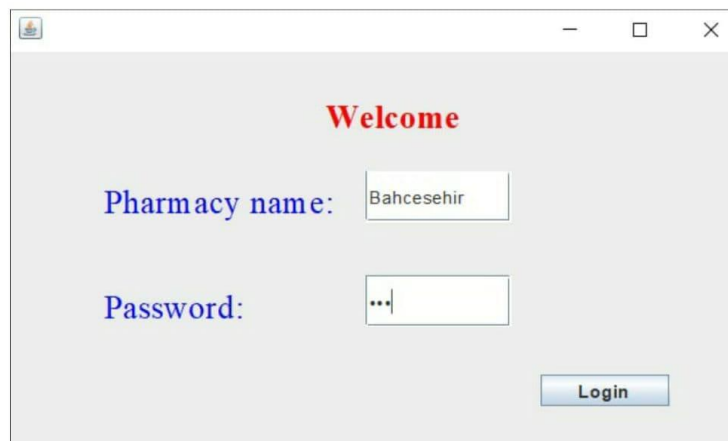
3. Application

1. Login to pharmacy

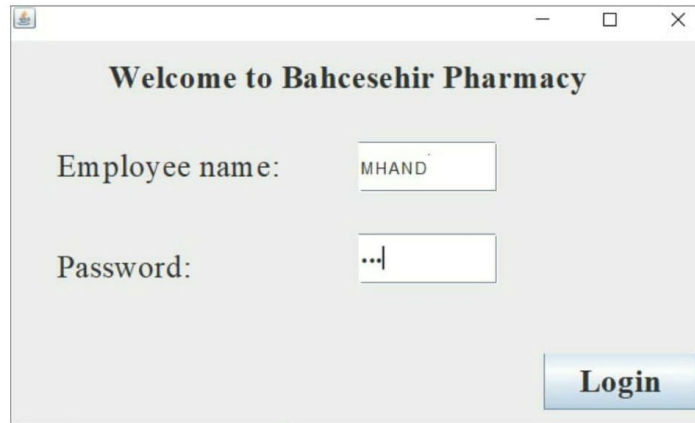
- A. If the pharmacy name or pharmacy password is entered wrongly, it will print an error message.



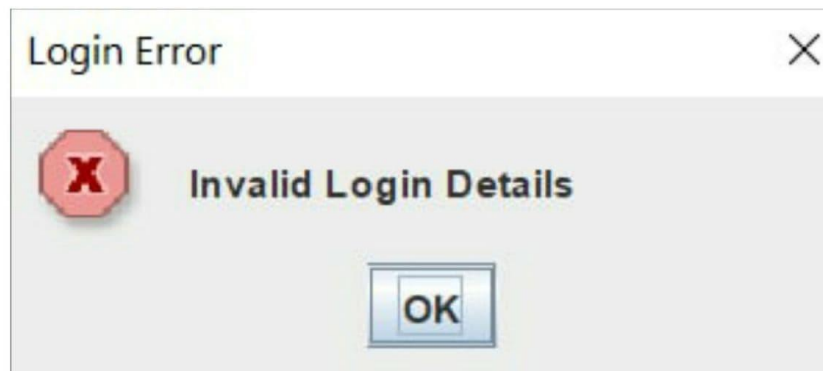
- B. If the pharmacy name or pharmacy password are correct, when the user click on Login, the system will open Login to employee



2. Login to employee_patient
 - A. If the employee name or password is entered wrongly, it will print an error message



A screenshot of a Windows-style application window titled "Welcome to Bahcesehir Pharmacy". The window has a light gray background and standard Windows window controls (minimize, maximize, close) in the top right corner. It contains two text input fields: "Employee name:" with the text "MHAND" entered, and "Password:" with masked characters "..." entered. A blue "Login" button is located at the bottom right of the window.



- B. If the employee name or password is entered correctly, that employee will be stored in a linked list to its pharmacy. When the user clicks Login, the system will open the window where all the information for the patients will be added, updated, searched, and deleted.

The image shows two overlapping windows from a software application. The top window is titled "Welcome to Bahcesehir Pharmacy" and contains a login form. The bottom window is a patient management interface with a sidebar for adding, updating, deleting, and searching patients, and a main table area.

Welcome to Bahcesehir Pharmacy

Employee name:

Password:

Login

Patient Management Interface

Left Sidebar:

- ID:
- Name:
- Surname:
- Phone numb...:
- Gender: ☐ Female ☐ Male
- Age:
- Email addres...:
- Address:
- Medicine name:
- Add** **Update** **Delete**
- Search**

Main Table:

ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
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3. Add patient

- ID, Phone number, Age will only accept numbers, Name and Surname will just accept alphabetical.

A. If the user did not enter ID, Name, Surname, Phone number, Age, Email address or Medicine name an error message will be displayed for the employee to fill all required information.

The screenshot shows a web application interface for adding a patient. On the left is a form with fields for ID, Name, Surname, Phone number, Gender (radio buttons for Female and Male), Age, Email address, Address (dropdown menu), and Medicine name. Below the form are buttons for 'Add', 'Update', 'Delete', and 'Search'. On the right is a table with columns: ID, Name, Surname, Phone number, Gender, Age, Email address, Address, and Medicine name. A modal message box is displayed in the center of the table area, containing the text 'Please Fill Complete Info ! :-)' and an 'OK' button.

B. If the user entered all the required information, the patient will be added to the Jtable and will be added to the pharmacy using LinkedHashMap and a message will be displayed to confirm that the adding operation finished successfully

This screenshot shows the same web application interface as the previous one, but with a success message. The form fields are now empty. The table on the right now contains one row of data: ID: 1900812, Name: umniah, Surname: abbood, Phone number: 057418936, Gender: F, Age: 20, Email address: u.a@gmail.com, Address: Istanbul, and Medicine name: Rinopanteina. A modal message box is displayed in the center of the table area, containing the text 'Saved Successfully ! :-)' and an 'OK' button.

4. Update patient

- ID, Phone number, Age will only accept numbers, Name and Surname will just accept alphabetical.

A. If the user did not enter ID, Name, Surname, Phone number, Age, Email address or Medicine name while updating the patient an error message will be displayed for the employee to fill all required information.

The screenshot shows a patient update form on the left and a table of patients on the right. The form fields are: ID (empty), Name (omer), Surname (mahmaed), Phone number (0547896321), Gender (Male selected), Age (12), Email address (empty), Address (Ankara), and Medicine name (Pulect). Below the form are buttons for Add, Update, Delete, and Search. The table on the right has columns: ID, Name, Surname, Phone number, Gender, Age, Email address, Address, and Medicine name. It contains two rows of data. A message dialog box is displayed in the center with the text "Please Fill Complete Info ! :-)" and an OK button.

ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
1900812	umniah	samer	0547896214	F	15	u s@gmail.com	Istanbul	Avicap
190124	omer	mahmaed	0547896321	M	12		Ankara	Pulect

B. If the user entered all the required information, the patient will be updated to the Jtable and will be replaced in the pharmacy using LinkedHashMap and a message will be displayed to confirm that the updating operation finished successfully

The first screenshot shows the patient update form with all fields filled: ID (1900713), Name (Iana), Surname (targ), Phone number (0584509896), Gender (Male selected), Age (18), Email address (targ@gmail.com), Address (Istanbul), and Medicine name (Avicap). The table on the right shows three rows of data. The second screenshot shows the same form and table, but with a message dialog box displaying "Updated Successfully ! :-)" and an OK button.

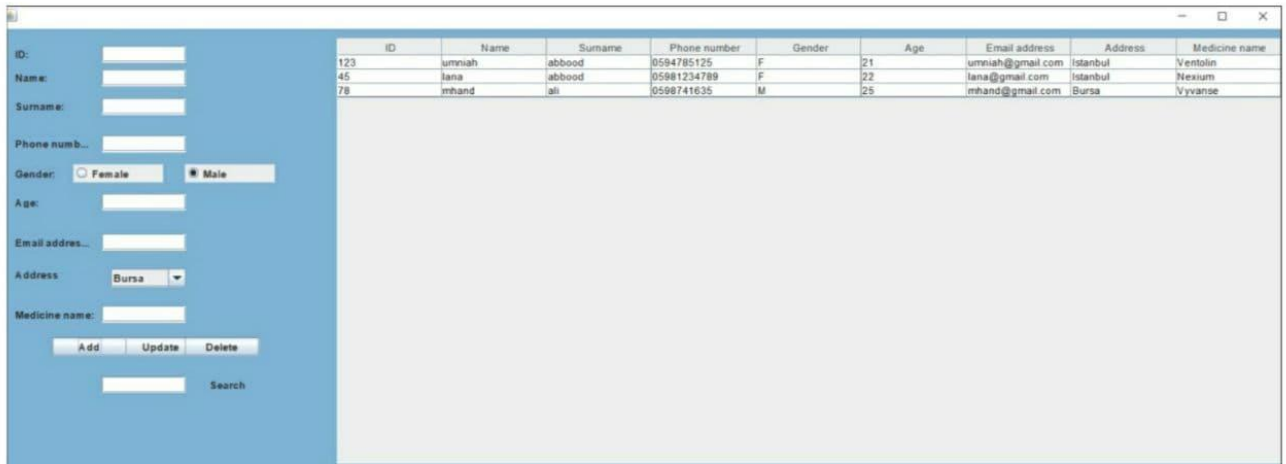
ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
1900812	umniah	abood	0563287419	F	20	umniah.abb@gmail	Istanbul	Rinopantena
1900712	Iana	targ	0584509896	F	18	targ@gmail.com	Ankara	Avicap
1900847	Mhand	mhamed	0547894235	M	25	Mhand@gmail.com	Istanbul	Pulect

5. Search patient

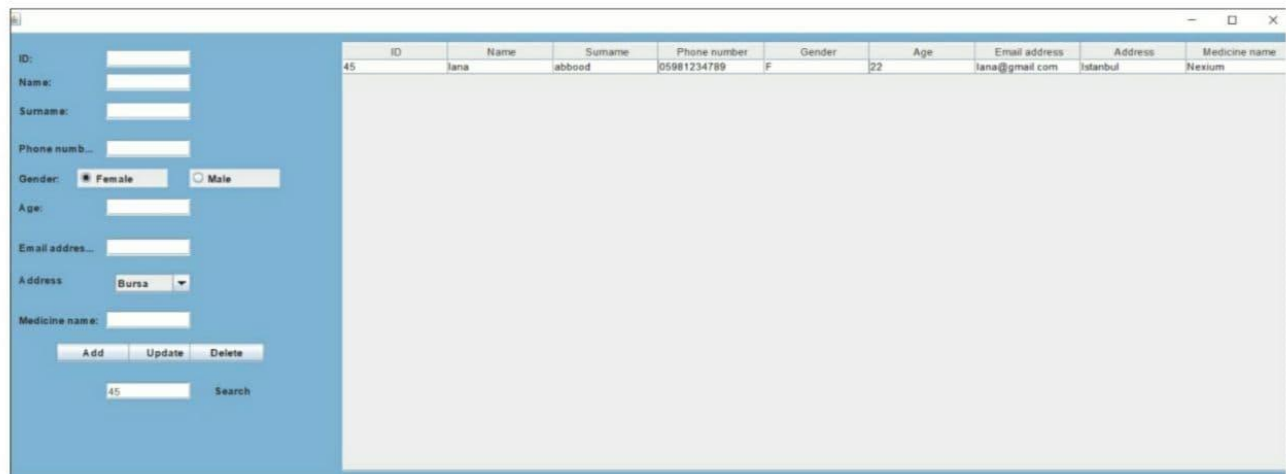
- Search will only accept numbers

We will search using the ID of that patient, as the id is the only unique value of our values.

Our search process is a filtering process, so when the user enter any number, the matching value will be filtered, as it is much faster for finding the patient.



ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
123	umniah	abbood	0594785125	F	21	umniah@gmail.com	Istanbul	Ventolin
45	Iana	abbood	05981234789	F	22	Iana@gmail.com	Istanbul	Nexium
78	mhahd	ali	0598741635	M	25	mhahd@gmail.com	Bursa	Vyvase



ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
45	Iana	abbood	05981234789	F	22	Iana@gmail.com	Istanbul	Nexium

6. delete patient

The user will select a patient from the JTable and click on delete button, the patient will be deleted from JTable as well as from LinkedHashMap and a message will be displayed to confirm that the deleting operation finished successfully

The application interface consists of a form on the left and a JTable on the right. The form contains fields for ID, Name, Surname, Phone number, Gender, Age, Email address, Address, and Medicine name, along with 'Add', 'Update', 'Delete', and 'Search' buttons. The JTable displays patient records with columns: ID, Name, Surname, Phone number, Gender, Age, Email address, Address, and Medicine name.

Top Screenshot: The 'Delete' button is highlighted. The JTable shows two records:

ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
1900812	umerah	sameer	0547896214	F	15	u.s@gmail.com	istanbul	Avicap
190124	omer	mahmaed	0547896321	M	12		Ankara	Pulect

Bottom Screenshot: The 'Delete' button has been clicked. The JTable now shows only one record:

ID	Name	Surname	Phone number	Gender	Age	Email address	Address	Medicine name
1900812	omer	mahmaed	0547896321	M	12		Ankara	Pulect

A message box titled 'Message' is displayed with the text 'Deleted Successfully !:-)' and an 'OK' button.

4. Conclusion / Summary

We aim to improve the quality of the medical service that will reduce human errors and facilitates the work of pharmacists and any other medical institution.

Therefore, we will achieve that by providing accurate, updated, and detailed information about patients enabling faster access to patient records for more synchronized, effective care and sharing of electronic information with patients and other medical institutions

5. References

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<https://www.geeksforgeeks.org/hashing-in-java/>

<https://www.geeksforgeeks.org/implementing-our-own-hash-table-with-separate-chaining-in-java>

<https://www.geeksforgeeks.org/hashing-set-2-separate-chaining/>

<https://www.youtube.com/watch?v=DLJCxmW1M4s>

<https://stackoverflow.com/questions/22066387>

Codes from SEN1002 Object Oriented Programming (java)