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| **Submitted By** | **Name :** Zaina Hassan  **Roll no :** SP24-BSE-126 |
| **Subject** | **Object Oriented Programming (OOP)** |
| **Assignment** | **Console Based Messaging App** |

**Submitted to :**

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| **Moderator** | **Muhammad Shahid Bhatti** |

**Thoery Assignment 1**

**1. Overview**

The program is a console-based messaging app simulation. It allows users to manage contacts, send and receive messages, view messages, and check message delivery status. It uses Java classes to model the application.

**2. Key Classes and Attributes**

**Message Class**

* **Attributes:**
  + id: A unique identifier for each message (static, auto-incrementing).
  + content: The text of the message.
  + timestamp: The time when the message was created (using LocalDateTime).
  + delivered: Boolean flag indicating whether the message has been delivered.
  + seen: Boolean flag indicating whether the message has been seen by the recipient.
  + sender: The name of the contact who sent the message.

**Contact Class**

* **Attributes:**
  + id: A unique identifier for the contact.
  + name: The contact's name.
  + phoneNumber: The contact's phone number.
  + messages: A list of Message objects representing messages sent and received by this contact.

**MessagingApp Class**

* **Attributes:**
  + contacts: A list of Contact objects representing the user's contact list.

**ConsoleMessagingApp Class**

* **Attributes:**
  + Contains a static MessagingApp instance and a Scanner instance to read user input.

**3. Key Methods**

**Message Class**

* **Constructor**: Initializes a new Message object with content, sender, current timestamp, and default values for delivered and seen.
* **Getters**: Methods like getId(), getContent(), getTimestamp(), isDelivered(), isSeen(), and getSender() provide access to private attributes.
* **Setters**: setDelivered(boolean delivered) and setSeen(boolean seen) update message delivery and read statuses.
* **displayMessage()**: Prints all details of a message, including the ID, sender, content, and delivery status.

**Contact Class**

* **sendMessage(String content)**: Creates and stores a new message in the contact’s message list.
* **receiveMessage(Message message)**: Adds a received message to the list and sets its delivered flag to true.
* **readMessages()**: Marks unread messages as seen and displays them.
* **displayAllMessages()**: Sorts and displays all messages in reverse chronological order.

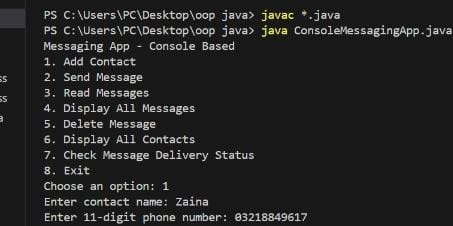
**MessagingApp Class**

* **addContact(String name, String phoneNumber)**: Adds a new contact to the contact list.
* **getContactByName(String name)**: Retrieves a contact by their name.
* **displayAllContacts()**: Displays all contacts' names and phone numbers.
* **checkMessageDeliveryStatus(Contact sender, Contact receiver)**: Displays delivery and seen status of messages between two contacts.

**ConsoleMessagingApp Class**

* **Main Loop**: Presents a menu of options, reads user input, and calls appropriate methods from the MessagingApp class.

**4. Expected Output**

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