

# Android USD-LBP Exchange App:

The Android USD-LBP Exchange app features a comprehensive suite of functionalities designed to facilitate currency exchange between USD and Lebanese Pounds (LBP). It includes a trading system for managing currency exchange offers, a chatting system that enables user communication through direct and group messages, and a statistics system that provides insights into transaction trends with graphical data visualizations. Additionally, a prediction system employs a neural network model to forecast future exchange rates, helping users make informed decisions.

## Trading System:

The trading system within the Android USD-LBP Exchange app allows users to view, create, accept, and manage currency exchange offers. This functionality is crucial for facilitating transactions between users who wish to exchange US dollars (USD) and Lebanese pounds (LBP).

### ActiveOffers Activity

Displays a list of active exchange offers to the user. Users can select an offer to delete or cancel it through a dialog interface.

Methods:

- fetchoffers(): Fetches the list of offers from the server.
- deleteOffer(int offerId): Sends a request to delete a selected offer.
- filterOffers(String username): Filters the displayed offers based on the username.

### Myacceptedoffers Activity

This activity displays the list of offers that belonged to the user before getting accepted.

### TradingFragment

A fragment that provides a comprehensive interface for managing offers. Users can view all offers, filter them, accept offers, initiate chat related to offers, and add new offers through a dialog.

Methods:

- showDialog(): Displays a dialog for the user to enter details for a new trade offer.
- fetchoffers(): Fetches all available trading offers.
- filterOffers(boolean usdToLbp): Filters offers based on the trade direction.
- acceptOffer(int offerId): Sends a request to accept an offer.
- addOffer(Offer offer): Adds a new offer based on user input from the dialog.

## Chatting System:

The chatting system in the Android USD-LBP Exchange app facilitates user communication through personal messages and group conversations. It includes features for managing chats, group conversations, and provides functionality for searching and initiating new chats or joining groups.

### ChatsActivity

This activity manages the tabbed interface for chats and groups, allowing users to switch between their personal chats and group conversations.

No Notable Methods as we are just setting up UI here

### ChatsFragment

A fragment representing the personal chats interface. It displays a list of users with whom the current user has had conversations, showing the last message.

Methods:

- fetchchat(): Retrieves all messages related to the user and processes them to update the UI.
- fetchUsersAndLastMessages(List<Message> messages): Extracts users and their last message to update the chat list.
- fetchUsernamesAndShowDropdown(): Fetches usernames for initiating new chats and displays them in a dropdown for selection.

### GroupConvo

This activity manages a specific group conversation, showing all messages within a group and allowing users to send new messages or leave the group.

Methods:

- fetchchat(): Fetches all messages for the group from the server.
- sendMessage(String messageText): Sends a new message to the group.
- scrollToBottom(): Scrolls to the latest message in the chat.

### GroupsFragment

Manages the interface for group interactions, showing a list of groups the user is part of and providing options to join new groups or create them.

Methods:

- fetchGroups(): Retrieves the groups the user is part of.
- displayGroupsPreview(): Updates the UI with groups and their last message.

- `fetchGroupMessages(String groupName, Callback)`: Fetches messages for a specific group to get the latest status.
- `showUsernamesDropdown()`: Displays available groups to join in a dropdown.
- `showGroupNameDialog()`: Provides a dialog to input a new group name for creation.

## Statistics :

The statistics part of the Android USD-LBP Exchange app provides users with a detailed analysis of their currency transactions over selectable periods and the exchange rate over time. It includes a dynamic line chart for visualizing transaction frequencies and text views for displaying transaction highs, lows, and volumes.

### statsActivity

This activity allows users to pick dates and view different statistical data related to currency exchanges, such as the number of transactions, the highest and largest transactions, and the total volume of transactions.

- `setUpDatePickers()`: Configures the date pickers for selecting the date range.
- `fetchDataFromBackend(String granularity)`: Fetches transaction data from the backend based on selected dates and granularity.
- `displayChartData(Map<String, Map<String, Double>> ratesMap)`: Processes and displays the fetched data on the line chart.
- `initialgraph()`: Fetches initial data to display when the activity is first loaded, providing immediate feedback to the user upon entering the stats page.

Metrics Displayed Other than the Graph:

- Highest Transaction: Displays the highest transaction in the selected period, including the conversion direction and amounts.
- Largest Transaction: Shows the transaction with the largest amount for the selected period.
- Volume of Transactions: Provides the total volume of transactions in USD and LBP for the selected dates.

## AI Prediction System

The prediction part of the Android USD-LBP Exchange app utilizes the server's built in neural network to forecast future exchange rates between USD and LBP. It provides visual representations of both historical and predicted exchange rates, enabling users to make informed decisions based on trends.

### Prediction Activity():

- `setupChart()`: Configures properties of the line chart, such as axis settings and interaction capabilities.

initialgraph(): Fetches historical exchange rate data from the last 30 days and the predicted rates for the next 30 days upon activity startup.

At the end of the page there is a feature that lets the user input any date he wants and the predicted exchange reate wull be provided.