

# Banking Application Backend Project

PROJECT PROPOSAL

GLEB SHKODA

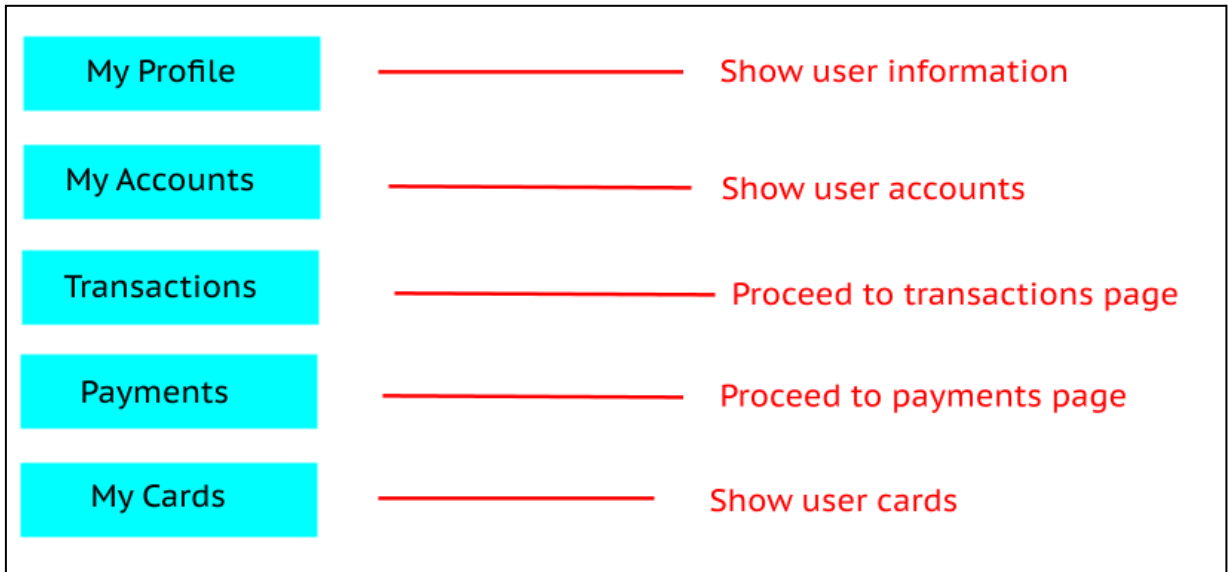
MAKSIM FISENKO

## Project Definition

Banking application is an application which allows users to manage their bank accounts and debit cards, allows users to transfer money between accounts, open new accounts and cards.

## Screen Mockups

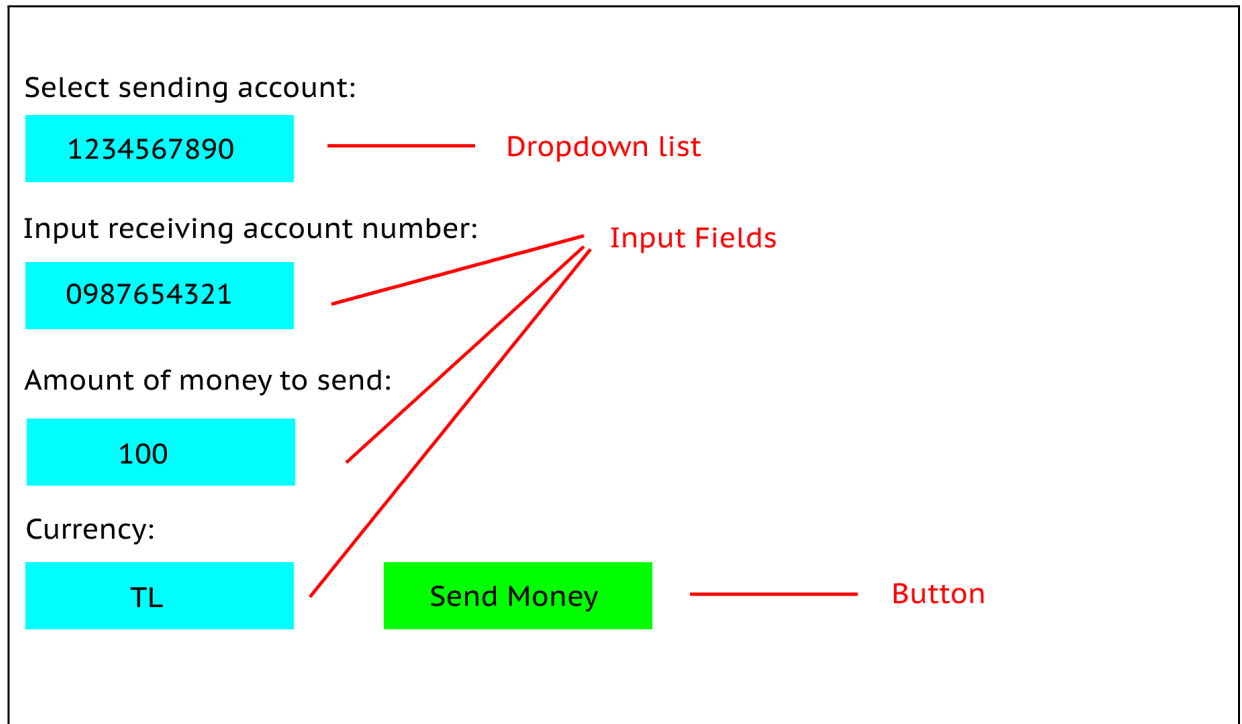
*Main Page*



A vertical list of five cyan buttons with black text, each followed by a red horizontal line and a red text label. The buttons and labels are: 'My Profile' (Show user information), 'My Accounts' (Show user accounts), 'Transactions' (Proceed to transactions page), 'Payments' (Proceed to payments page), and 'My Cards' (Show user cards).

My Profile	—————	Show user information
My Accounts	—————	Show user accounts
Transactions	—————	Proceed to transactions page
Payments	—————	Proceed to payments page
My Cards	—————	Show user cards

*Transferring money between 2 accounts*



A form for transferring money between two accounts. It includes four input fields (cyan boxes) and one button (green box). Red lines connect labels to the corresponding form elements: 'Dropdown list' to the first input field, 'Input Fields' to the second, third, and fourth input fields, and 'Button' to the 'Send Money' button.

Select sending account:

1234567890 ————— Dropdown list

Input receiving account number:

0987654321 ————— Input Fields

Amount of money to send:

100 ————— Input Fields

Currency:

TL ————— Input Fields

Send Money ————— Button

### Opening a new debit card

Select an account to open a new card:	Your card is opened!
<input type="text" value="1234567890"/>	Card name: MyCard1
Choose the name of the card:	Card number: 1234 5678 9012 3456
<input type="text" value="MyCard1"/>	Expiration date: 01-01-2099
<input type="button" value="Open a new card"/>	

### Changing the account currency

Account number: 1234567890	Currency has been changed!
Current amount: 1000	New amount: 34.70
Current currency: TL	New currency: USD
Input new currency:	The new amount has been calculated.
<input type="text" value="USD"/>	
<input type="button" value="Change currency"/>	

### Closing an account

Your accounts:

MyAccount1	50	USD
MyAccount2	0	TL

User cannot close MyAccount 1 as its balance is higher than 0.

User can close MyAccount2.

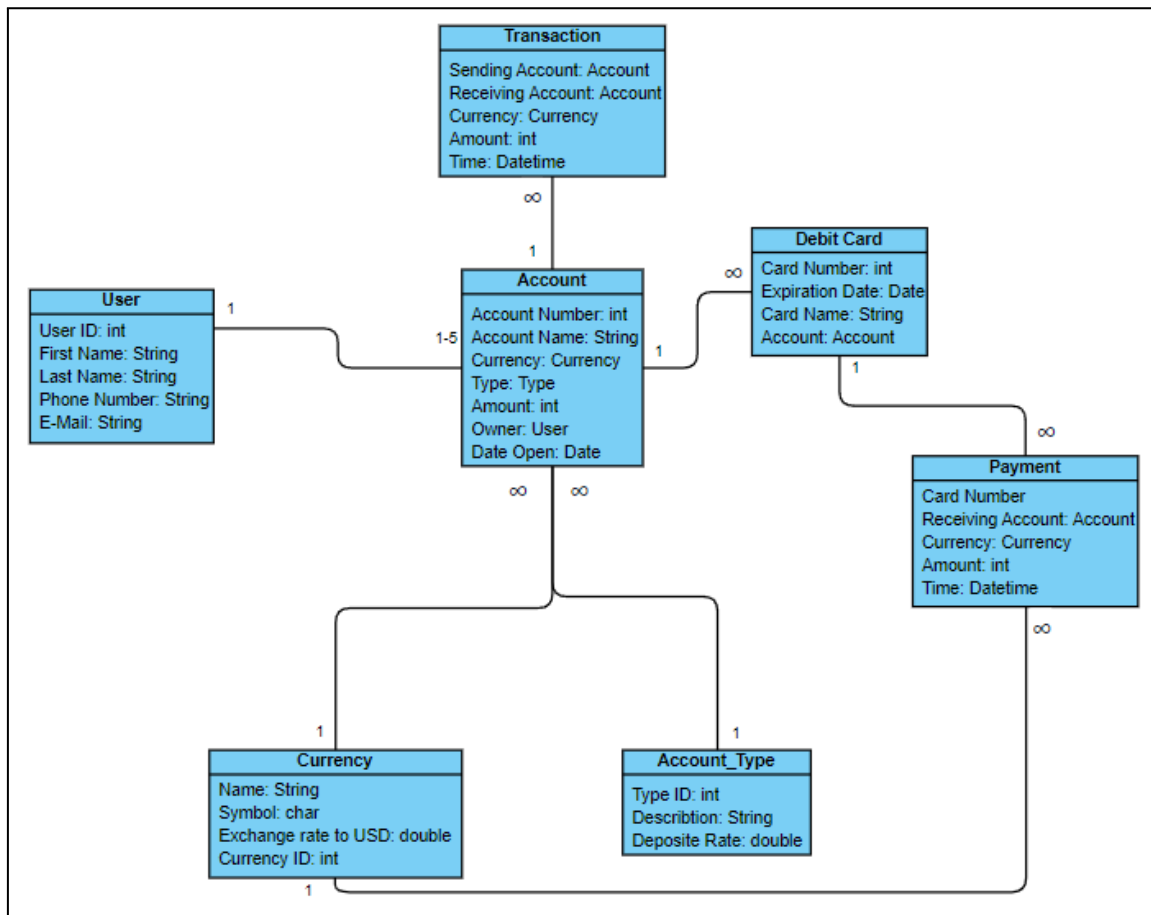
### Objects

Class Name	Description
User	<p>All users can open multiple accounts of different types, they can have multiple debit cards, make transactions between their accounts and between other accounts</p> <p>User will have</p> <ul style="list-style-type: none"><li>● User ID</li><li>● First Name</li><li>● Last Name</li><li>● Phone Number</li><li>● E-mail</li></ul>
Account	<p>Account is owned by only one user; it has a unique id. Money is deposited in one of the supported currencies. Accounts can be of one of the offered types. Transactions between 2 accounts are possible. Many debit cards can be connected to one account.</p> <p>Accounts will have:</p> <ul style="list-style-type: none"><li>● Account Number</li><li>● Account Name</li><li>● Currency</li><li>● Type</li><li>● Owner</li><li>● Open Date</li></ul>

Currency	<p>Many currencies are supported by the bank, each currency has a symbol of it, in order to provide services in several currencies, an exchange rate to USD is written for all currencies.</p> <p>Currencies will have:</p> <ul style="list-style-type: none"> <li>● Currency ID</li> <li>● Currency Name</li> <li>● Currency Symbol</li> <li>● Currency Exchange Rate to USD</li> </ul>
Account Type	<p>Each account has a designated type, which represents the benefits owner gets from having the account</p> <p>Account Types will have:</p> <ul style="list-style-type: none"> <li>● Account Type ID</li> <li>● Account Type Name</li> <li>● Account Type Description</li> <li>● Deposit Rate</li> <li>● Transfer Fee</li> </ul>
Debit Card	<p>Debit Cards are connected to only one account. Payments are done through debit cards.</p> <p>Debit Cards will have:</p> <ul style="list-style-type: none"> <li>● Card Number</li> <li>● Expiration Date</li> <li>● Card Name</li> <li>● Account</li> </ul>
Transaction	<p>A log of direct transactions between 2 accounts. There can be multiple transactions between every account</p> <p>Transactions will have:</p> <ul style="list-style-type: none"> <li>● Sending Account</li> <li>● Receiving Account</li> <li>● Time of Transaction</li> <li>● Currency</li> <li>● Amount</li> </ul>
Payment	<p>A log of payments done from a debit card. Money is sent to the receiving account.</p> <p>Payment will have:</p> <ul style="list-style-type: none"> <li>● Sending Card</li> <li>● Receiving Account</li> <li>● Time of Payment</li> <li>● Currency</li> </ul>

- Amount

## Class Diagram



## Backend Services

Service	Description
Open a new account	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>• User ID</li> <li>• Currency</li> <li>• Account Type</li> <li>• Account Name</li> </ul> <p><u>Return value:</u> Integer</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>• Return new account number if completed successfully</li> </ul>

	<ul style="list-style-type: none"> <li>● Create new entry at Account table</li> <li>● Return -1 and do nothing if completed unsuccessfully</li> </ul>
Change account currency	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● Account ID</li> <li>● New currency</li> </ul> <p><u>Return value:</u> Integer</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Return a new amount of the account if completed successfully.</li> <li>● Change the amount at the corresponding account entry according to the exchange rate at the Currency table.</li> <li>● Change the currency value at the corresponding account entry to the new currency.</li> <li>● Return -1 and do nothing if completed unsuccessfully.</li> </ul>
Close an existing account	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● Account ID</li> </ul> <p><u>Return value:</u> Boolean</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Account can be deleted only if its amount is 0</li> <li>● Return true if operation is successful</li> <li>● Delete entry corresponding with Account ID from account table</li> <li>● Return false and do nothing if completed unsuccessfully</li> </ul>
Delete all users with no account	<p><u>Input parameters:</u> None</p> <p><u>Return value:</u> Boolean</p> <p><u>Business rules:</u></p>

	<ul style="list-style-type: none"> <li>● Return true if completed successfully .</li> <li>● Select all users from the User table, which doesn't have any corresponding accounts.</li> <li>● Delete those entries.</li> <li>● Return false and do nothing if completed unsuccessfully .</li> </ul>
Transfer money between 2 accounts	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● Sending account</li> <li>● Receiving account</li> <li>● Amount</li> <li>● Currency</li> </ul> <p><u>Return value:</u> Integer</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Return the remaining amount on the sending account (cannot be less than 0).</li> <li>● Remove the transfer amount + transfer fee.</li> <li>● Add the transfer amount to the receiving amount .</li> <li>● Add an entry to the Transaction table.</li> <li>● Return -1 and do nothing if completed unsuccessfully.</li> </ul>
Get the amount on the selected account on the selected date	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● Account number</li> <li>● Date</li> </ul> <p><u>Return value:</u> Integer</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Return amount on the account at the required date</li> <li>● Calculate the required value using Transaction table</li> <li>● Return -1 if the account did not exist at the required date</li> </ul>
Open a new debit card	<u>Input parameters:</u>



	<ul style="list-style-type: none"> <li>● Account Number</li> <li>● Card Name</li> </ul> <p><u>Return value:</u> List with information about a new card:</p> <ul style="list-style-type: none"> <li>● Card Number</li> <li>● Expiration Date</li> </ul> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Add a new entry to a Debit Card table</li> <li>● Return an empty list and do nothing if the operation is unsuccessful.</li> </ul>
Make a payment with a debit card	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● Debit Card Number</li> <li>● Receiving Account Number</li> <li>● Amount</li> <li>● Currency</li> </ul> <p><u>Return value:</u> Boolean</p> <p><u>Business rules:</u></p> <ul style="list-style-type: none"> <li>● Return true if operation is successful</li> <li>● Remove the payment amount from the account corresponding with debit card (it cannot be less than 0)</li> <li>● Add the amount to the receiving account</li> <li>● Add information about the payment to the Payment method</li> <li>● Add information about the account transaction to the Transaction table</li> <li>● Return false and do nothing if the operation is unsuccessful</li> </ul>
Get the list of all debit cards belonging to the user	<p><u>Input parameters:</u></p> <ul style="list-style-type: none"> <li>● User ID</li> </ul> <p><u>Return value:</u> List of all Debit Card Numbers belonging to the accounts that belong to the selected user.</p> <p><u>Business rules:</u> none</p>

Get information about all the payments done with the selected card in the selected period.

Input parameters:

- Debit Card Number
- Start Date
- End Date

Return value:

List of all payments done with this card on the selected period. Information about payments must include:

- Date
- Amount
- Currency

Business rules:

None