BLG 439E
COMPUTER PROJECT1

BITCOIN WALLET INTERFACE

Final Project Report

Sercan Aydın 150170707

15.11.2020

Task History

Date	Task	Author	Comments
19/10/2020 26/10/2020	-	-	Course is taken in Add/drop week
26/10/2020 02/11/2020	Research	Sercan Aydın	Initial research is done and determined technical requirements
02/11/2020 07/11/2020	Frontend and database connection	Sercan Aydın	Implemented frontend details and database connection
07/11/2020 13/11/2020	Backend	Sercan Aydın	Implemented backend services
13/11/2020 15/11/2020	Test and Final report preparation	Sercan Aydın	Tested interface and software modules. Added to final report.

İçindekiler Tablosu

1. Introduction

In this project, it is asked to implement a bitcoin interface (this can be called a bitcoin wallet as well) and build a system based on bitcoin client to operate on the bitcoin network. Wallets are files that provide access to multiple bitcoin addresses. System would have an interface for users to create keys and make transactions on the bitcoin network. Interface check public key validity. User accounts would be held in simple database. The Bitcoin wallet project aims to provide bitcoin interface its users. This environment enables users to have complete control over funds and Ideal for transaction large amounts of bitcoin.

1.1 Purpose

The Purpose of this document is to outline for the Bitcoin wallet interface to be developed for Computer Project course. This document will be used by all stakeholders.

1.2 References

Bitcoin white paper by Satoshi

2. Features/Modules

The Bitcoin wallet interface will have one role

1. User

Following features/modules will be available to this role:

User
Register
Sending Bitcoin
Receiving Bitcoin
Balance Enquiry
Creating Keys
Login & Logout

Description of the modules

Module Name	**Description**
Balance Enquiry	Users can view balance of his accounts only
Register	New users can be added to database
Sending Bitcoin	Users can have transfer bitcoin from his “own” account to any destination account.
Receiving Bitcoin	Users can have receive bitcoin from another accounts.
Creating Keys	Users can create public and private keys.
Login & Logout	Users can log into the interface and log out from interface.

3. TASKS

3.1 Research week

In this week, I decided to implement a web based application. I choosed to use Javascript programming language and Vue.js framework for this application. Because, Vue.js framework is user- and developer-friendly, has tons of useful libraries, a solid community and a great toolset. Javascript enables me clean and rapid development environment using Vue.js framework. Also, Vue.js framework is easy to learn and it's flexible by nature.

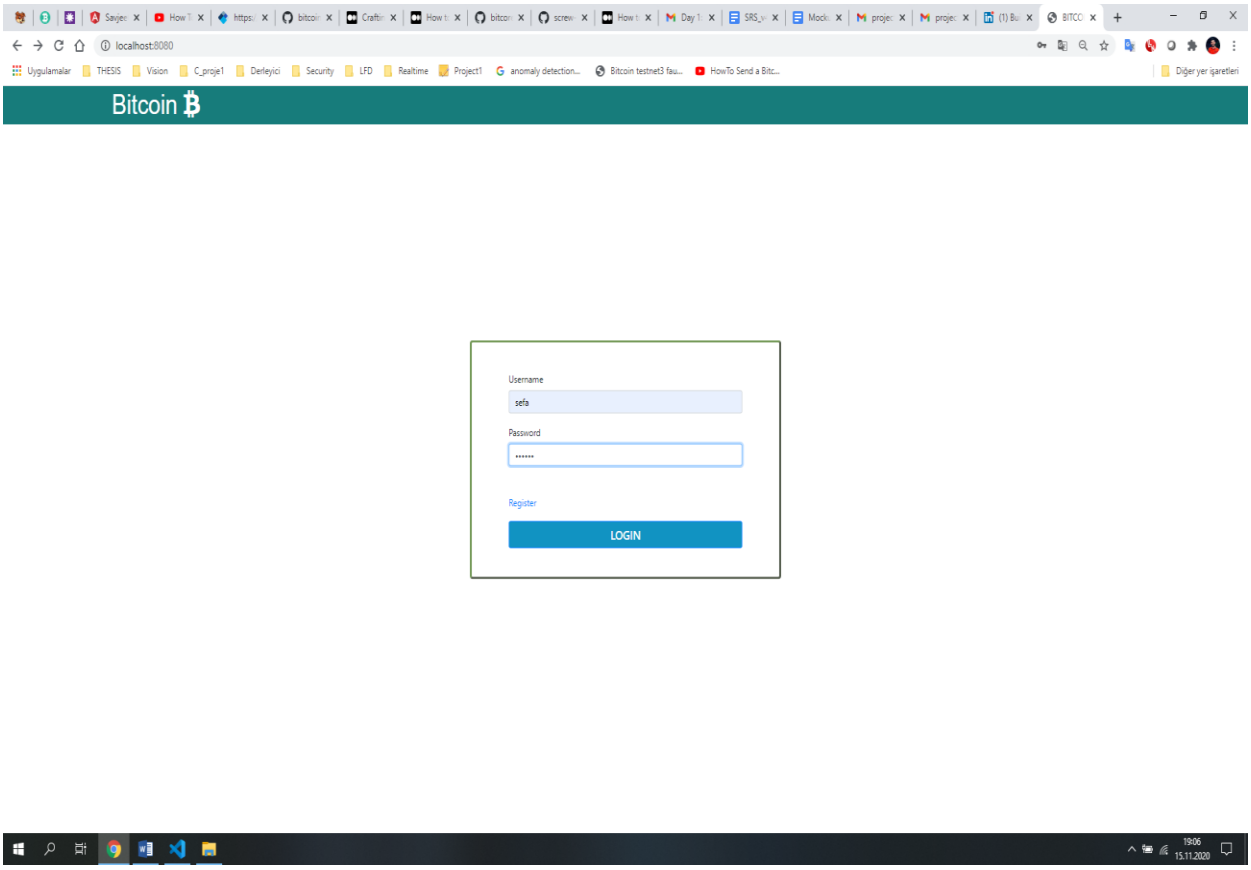
In order to store user accounts in database, I used MongoDB which is an open-source document database and leading NoSQL database. MongoDB has a worldwide following in the developer community. Document databases are extremely flexible. This database is combined with many features that safely store and scale data. In addition, I used Robo 3T (formerly Robomongo) which is the free, lightweight, open-source MongoDB GUI with an embedded mongo shell.

3.2 Frontend development and MongoDB connection

In frontend, Routing is essential in many aspects, it allow user switch between pages without page refreshing the thing that make the navigation easy and really nice in your web application. I implemented Vue.js routers for every page. I created user table which stores user information. Then, I connected to MongoDB database.

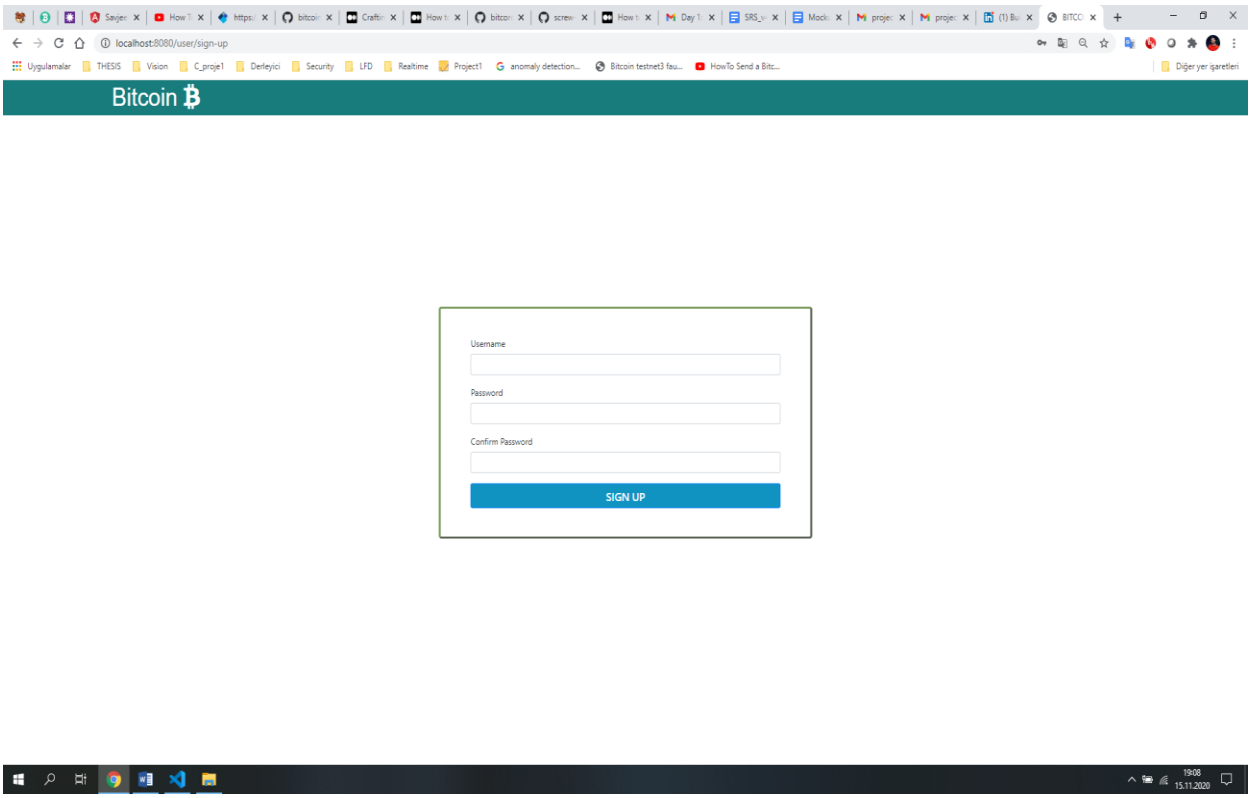
3.2.1 Login page

In order to project user's bitcoins, only the account owner should have access to his account. The user information which is username and password are taken then matches in database. If this matching is not successful, you will get an error message.



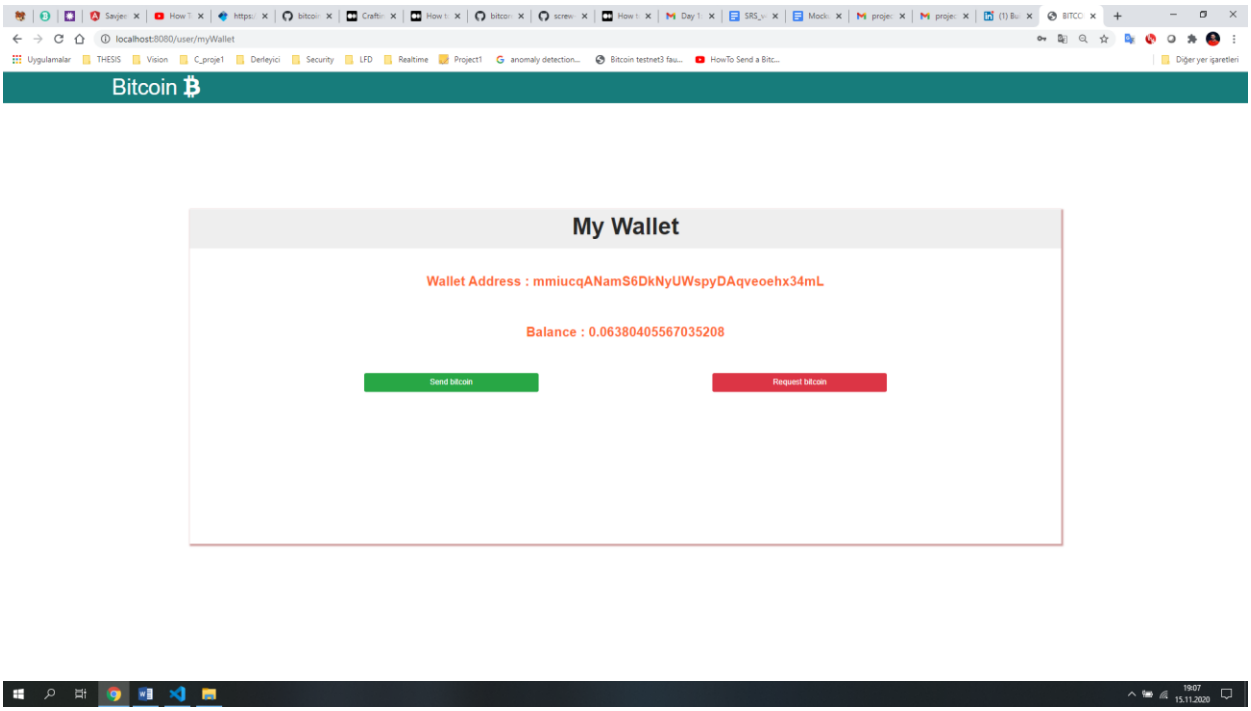
3.2.2 Signup page

User must create an account to use the wallet. Username and password address are saved to users table in database. Every time when an account is created, the server generates key pairs which are private key and public key. These keys stores in users table. The private key is needed to send bitcoin and public key address is needed to receive bitcoin.



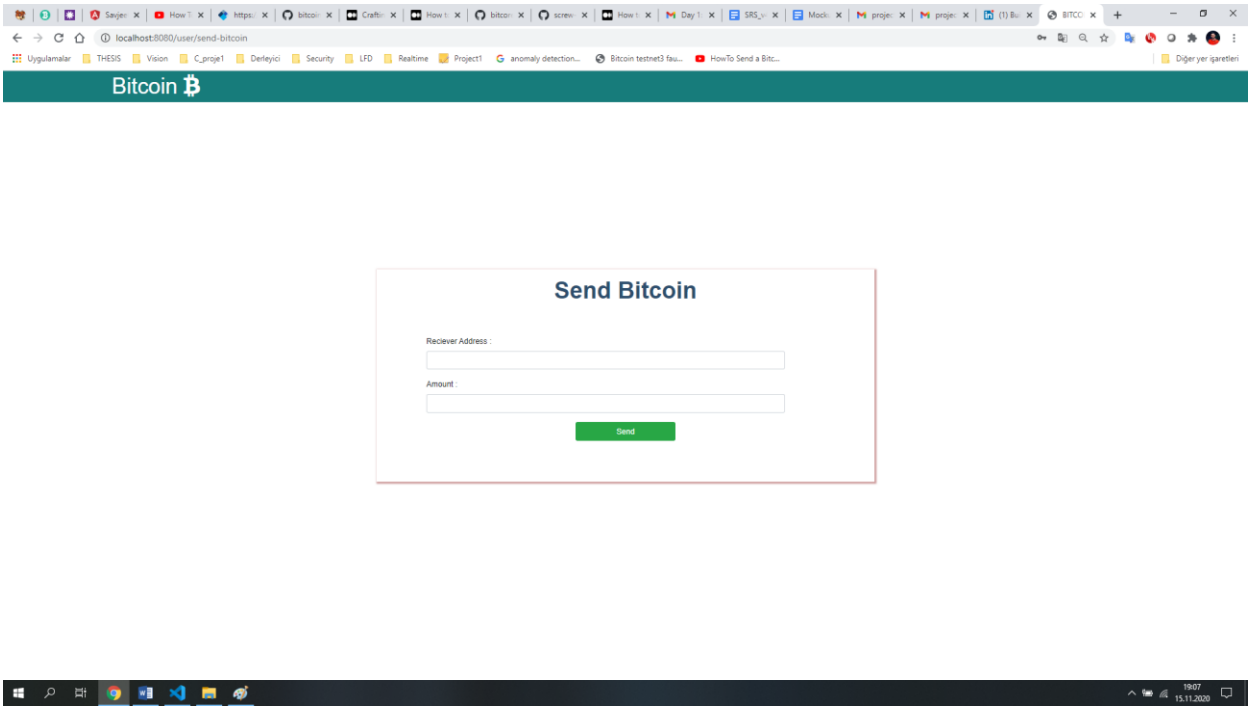
3.2.3 Home page

In this page, you can see balance and wallet address. Thanks to button, you can choose bitcoin related jobs such as request bitcoin, send bitcoin. The vue.js rooter will guide you.



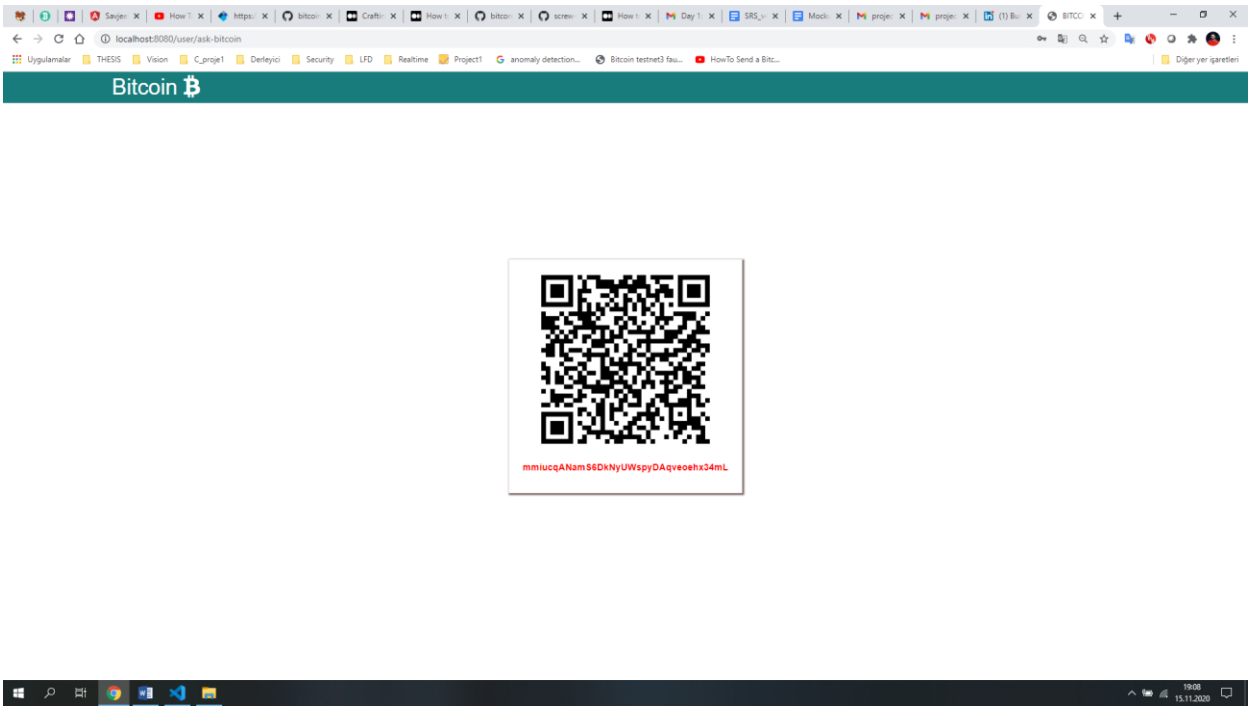
3.2.4 Send-Bitcoin page

In this page, user can transfer his/her bitcoins to another bitcoin address. User should provide a valid address and the amount the he wants to send. These information is processed in backend server and then sent to bitcoin network.



3.2.5 Request-Bitcoin page

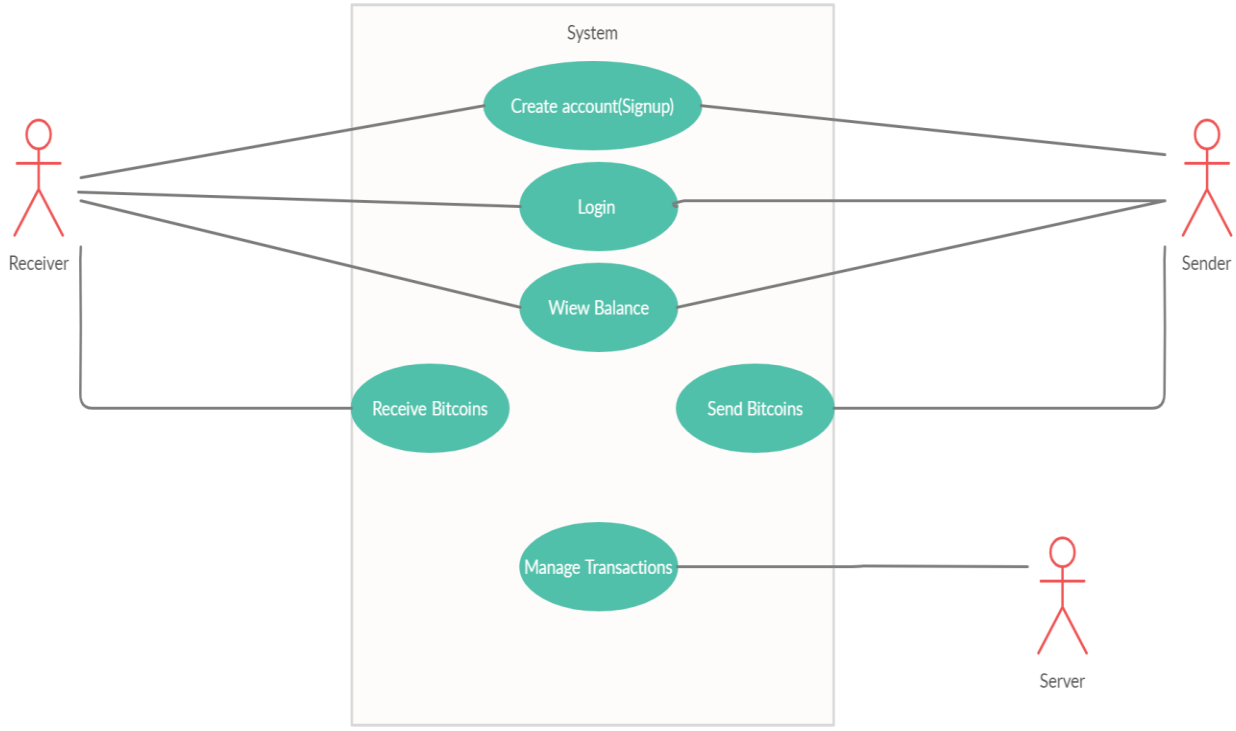
In this page, people can send you bitcoins by scanning the QR code. Also, you receive bitcoins by sharing own public key address.



3.3 Backend implementation

In this part of the project, I implemented index.js which creates MongoDB connection. Thanks to backend implementation, I saved username, password, private and public keys to users table. I processed an incoming webpage request and accessed data from database. I stored and updated records in a database. I passed information to backend. As a result, the server is ready and connection with MongoDB is established.

4. Use cases



- Receiver and Sender can create an account.
- Receiver can receive bitcoins from senders.
- Sender can send bitcoins to receiver.
- Server can manage transactions.
- Receiver and sender can see own balance.
- Sender and receiver can log into the interface.