North South University

Department of ECE

CSE215L Project Report Fall 2022

CRYPTOX

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UML Diagram

Main
+main(args:String[]):void +Dashboard(user:User):void +SignIn(username: String, pass: String, users: FetchUser[]):User +SignOut(ob: User):void +returnToDashboard(user: User):void +clearScreen():void +QuitProgram():void

Crypto
+name: String +totalValue: double +holding: double +changePercentage: double +symbol: String +cryptoInfo: CryptoInfo[]
+showCryptoInfo(): void +Crypto(symbol: String, holding: double)

CryptoInfo
+name: String +value: double +symbol: String +changePercentage: double
+CryptoInfo(name: String, value: double, symbol: String, changePercentage: double)

User
+userId:String +fullName:String +email:String +username:String +pass:String +NID:String +phoneNumber:String +currentBalance:double +isLoggedIn:boolean +holdedCrypto:Crypto[] +transactionHistory:Transaction[] +addMoneyMedium:String +amount:double +addMoneyMediums:String[] +Pin:String +BkashAc:String +BkashPin:String +PaypalAc:String +PaypalPin:String
+User(userId:String, fullName:String, email:String, username:String, NID:String, phoneNumber:String, currentBalance:double) +User(userId:String, fullName:String, email:String, username:String, pass: Strong, NID:String, phoneNumber:String, currentBalance:double) +hashPassword(pass:String):String +addTransaction(t: Transaction):void +addCryptoToHoldings(c: Crypto): void +deposit(amount:double):void +withdraw(amount:double):void +mediumPin(String Account,String pin):void +cardMedium(String Account,String pin):void +bkashMedium(String Account,String pin):void +paypalMedium(String Account,String pin):void +getBalance():double +getBkashAc():String +getBkashPin():String +getAccount():String +getAccountPin():String +getPaypalAc():String +getPaypalPin():String +callMedium(addMoneyMedium:String, amount:double):void +buyCrypto(c:Crypto):void +sellCrypto(symbol: String):void +swapCrypto(fromCrypto: String, toCrypto:String):void +getTotalCryptoValue():double +showHoldedCryptos():void +showTransactionHistory():void

Transaction
+transactionId: String +transactionType: String +amount: double +dateTime: LocalDatetime +currency: String
+Transaction(transactionId: String, transactionType: String, amount: double, dateTime: LocaldateTime, currency: String) +Transaction(transactionType: String, amount: double) +Transaction(transactionType: String, amount: double, currency: String)

Database
+url:String
+fetchUsers():FetchUser[] +fetchUserDetails(userId:String):User +addUserToDatabase(user: User):void +addTransactionToDatabase(userId: String, t: Transaction):void +updateCurrentBalance(userId: String, amount: double):void +removeRowFromHoldings(userId:String, symbol:String):void + updateRowInHoldings(userId: String, c: Crypto):void +addRowToHoldings(userId: String, c: Crypto):void

FetchUser
+userId:String +username:String +password:String
+FetchUser(userId:String, username:String, password:String)

InvalidCrypto
+InvalidCrypto(message: String)

InvalidEmail
+InvalidEmail(message: String)

InvalidNID
+InvalidNID(message: String)

InvalidPhoneNumber
+InvalidPhoneNumber(message: String)

InvalidUsername
+InvalidUsername(message: String)

InsufficientBalance
+InsufficientBalance(message: String)

Introduction

Cryptox is a crypto wallet that is used to hold crypto currencies and perform other tasks related to crypto currencies. Our main objective in this project was to create a wallet that allows users to have an account in the wallet and shows them their holdings in crypto currencies, information about those crypto currencies, balances, and allows them to perform other tasks using their current crypto currency holdings. Our aim was to create a wallet that is user-friendly and easy to use. This project is significant because crypto currencies are a digital form of currency and facilitate faster transactions than normal currencies. So having a wallet that lets users buy crypto currencies in exchange for their money is really helpful and efficient for the users.

Features

The key features of Cryptox are:

1. User authentication is the initial step in Cryptox's security protocol, just like it is in any other wallet.
2. Each user can get an unique wallet from it.
3. Hash passwords are used during user authentication for additional security.
4. It has capabilities for both contributing money from outside sources and withdrawing money.
5. It features buying, selling and swapping crypto currency.
6. It has the feature to show current holdings and transaction history of the user
7. And lastly it features the option of signing out from the users dashboard.

Applications

1. As Cryptox is a wallet that holds currencies, the first thing our wallet features is user authentication. If the user is new, then the user needs to sign up with their full name, username, password, email, phone number, and other information. If the user already has an account, then the user needs to sign in using their username and password.
2. A hash password makes sure that the password is not visible while the user types it and that the password is saved in the database with a different set of characters. So no one will be able to know the real password even if they have access to the database. This way, each individual can open their own wallet and keep their currencies safe.
3. Add money helps the user add the required amount of money to their respective wallets in order to buy their desired crypto currencies.
4. Withdrawing money helps users withdraw their required funds from their wallet balance.
5. Buy crypto lets the user buy their desired crypto currencies in exchange for the current balance in US dollars in their wallet.
6. Sell crypto lets the user sell the current crypto currency they hold in exchange for US dollars.
7. Swap crypto allows users to swap any of the current crypto currencies they hold for another crypto currency that they don't hold.
8. The cryptographic information that the user presently holds is shown in Current Holdings.
9. Transaction history helps the user find out all the transactions made by the user, whether it is adding or withdrawing money, buying, selling, or swapping a crypto.
10. Sign-out works when the user wants to sign out of their account.

Limitations

Along with some awesome features in our crypto wallet, there are some limitations as well. Such limitations are:

1. Resetting password,
2. Database security,
3. Two-step verification,
4. Partial Crypto selling,
5. Less crypto currency options,
6. Fluctuation of crypto currency values,
7. No loss gain stats,
8. No password recovery feature,
9. No implementation of GUI,
10. No feature exists for sending money to another account or receiving money from another account.

Future Work

1. As Cryptox has some limitations, we can work on those limitations and make our project better. For future work, we can implement the feature of resetting the password, which will let the user change the password.
2. As our program lacks security in the database, there is a chance for our database to be hacked. To solve this in the future, we can increase our security and implement two-step verification for each user, so that the user needs both their phone number and email address for verification every time they sign in.
3. We can add the feature of partial crypto selling, which will let users sell their crypto holdings partially or as much as they want.
4. As this is a prototype for a bigger project, we've used only 5 crypto currencies, but for future work we can add more crypto currencies to our database.
5. Since we didn't work with real crypto values and we didn't take help from 3rd party APIs, that's why the crypto values always remained the same in our wallet. For future work, we can implement a system that will fetch data on each crypto currency's present value and show the fluctuation rates to the user at that time.
6. We can have a feature that shows the user the stats of their loss or gain in each transaction.
7. We can have a user interface for the future work, as we didn't include any GUI for the time shortage.
8. Also, we don't have any feature that allows the user to send or receive crypto currencies from other accounts. So we can implement the send or receive cryptography feature for future work.