Cypherock Technical Screening task - Full Stack- Bitcoin Management System

1. Candidate information

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Resume-
https://drive.google.com/file/d/1ooIh6ijV6xWmdtTxvH25xi_O1xYWk6ov/view?usp=sharing

1.Introduction-

The Bitcoin Wallet Management code is a Node.js application that allows users to create and manage Bitcoin wallets. It provides a set of functions to perform various wallet operations, including creating wallets, importing wallets from mnemonic phrases, listing existing wallets, checking balance, fetching transactions, and generating unused addresses.

2.Installation-

To run the Bitcoin Wallet Management code, please follow these steps:

- Ensure you have Node.js installed on your machine. If not, download and install Node.js from the official website: https://nodejs.org
- Clone or download the code from the repository.
- Open a terminal or command prompt and navigate to the project directory.
- Install the required dependencies by running the following command:

Copy code

```
npm install
```

- You're now ready to use the Bitcoin Wallet Management code!

3.Usage-

The Bitcoin Wallet Management code can be used as a command-line application to perform various wallet operations. The available commands are:

- **create <walletName>**: Creates a new Bitcoin wallet with the specified name.
- **import <walletName> <mnemonic>**: Imports a BIP39 wallet using the provided mnemonic phrase and assigns it the specified name.
- **list**: Lists all existing wallets.
- **balance <walletName>**: Retrieves the balance of the specified wallet.
- **transactions <walletName>**: Fetches the transactions associated with the specified wallet.
- **generate-address <walletName>**: Generates an unused Bitcoin address for the specified wallet.

To execute a command, run the following command in the terminal:

```
node main.js <command> [arguments]
```

4.Code Structure

The code follows a modular structure to group related functionalities together. Here's an overview of the code structure:

- **wallet.js**: Contains functions related to wallet operations, including creating wallets, importing wallets, listing wallets, checking balance, fetching transactions, and generating addresses.
- **api.js**: Contains functions for making API calls to interact with the Bitcoin blockchain.
- **util.js**: Contains utility functions used by other modules.
- **main.js**: An example file showcasing how to use the functions from the **wallet.js** module.

You can organize the code files further based on your project structure and requirements. Ensure to keep related functions together and maintain a clear separation of concerns.

5.Dependencies

The Bitcoin Wallet Management code relies on the following dependencies:

- **axios**: Used for making HTTP requests to interact with the Bitcoin blockchain.
- **dotenv**: Used for loading environment variables from a **.env** file.
- **bitcoinjs-lib**: Used for Bitcoin wallet creation and address generation.
- **bip39**: Used for generating and converting mnemonic phrases.

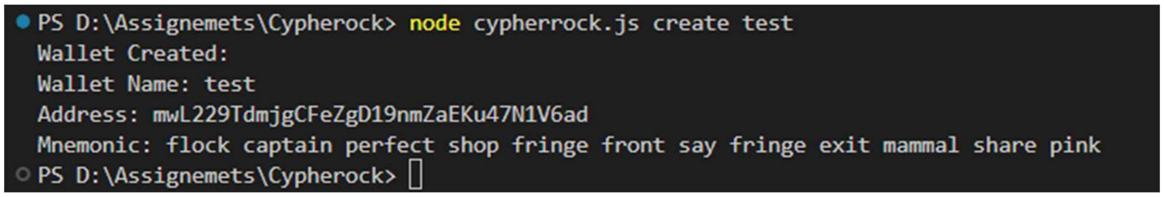
These dependencies are defined in the package.json file and will be automatically installed when you run npm install.

6.Test Outputs

Here are some sample test outputs for the Bitcoin Wallet Management code:

- Creating a new wallet:

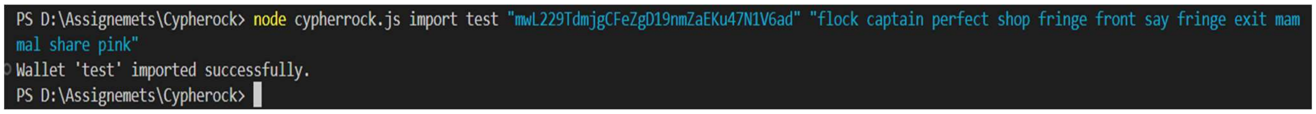
  Write node cypherrock.js create test



```
PS D:\Assignemets\Cypherock> node cypherrock.js create test
Wallet Created:
Wallet Name: test
Address: mwL229TdmjgCFeZgD19nmZaEKu47N1V6ad
Mnemonic: flock captain perfect shop fringe front say fringe exit mammal share pink
PS D:\Assignemets\Cypherock>
```

This will generate and store a new BIP39 wallet with the name given by the user and store it locally.

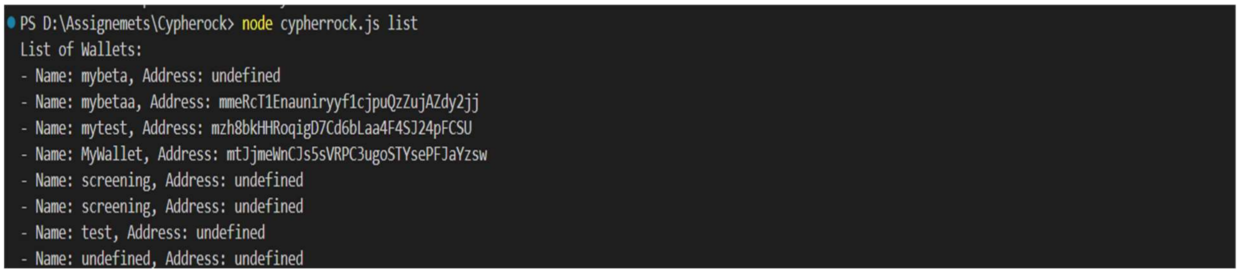
- Importing a wallet:
  Write node cypherrock.js import “<address >” “<mnemonics>”



```
PS D:\Assignemets\Cypherock> node cypherrock.js import test "mwL229TdmjgCFeZgD19nmZaEKu47N1V6ad" "flock captain perfect shop fringe front say fringe exit mam
mal share pink"
Wallet 'test' imported successfully.
PS D:\Assignemets\Cypherock>
```

This will import the wallet as test.json and will include the address and mnemonics in the json file and store it locally.

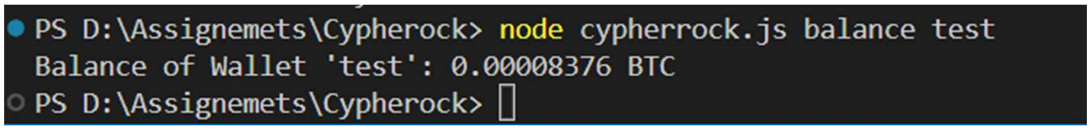
- Listing all wallets:
  Write node cypherrock.js list



```
PS D:\Assignemets\Cypherock> node cypherrock.js list
List of Wallets:
- Name: mybeta, Address: undefined
- Name: mybetaa, Address: mmeRcT1Enauniryyf1cjpuQzZujAZdy2jj
- Name: mytest, Address: mzh8bkHHRoqigD7Cd6bLaa4F4SJ24pFCSU
- Name: MyWallet, Address: mtJjmeWnCJs5sVRPC3ugoSTYsePFJaYzsw
- Name: screening, Address: undefined
- Name: screening, Address: undefined
- Name: test, Address: undefined
- Name: undefined, Address: undefined
```

This function will list all the existing wallets in the local system with their address and mnemonics.

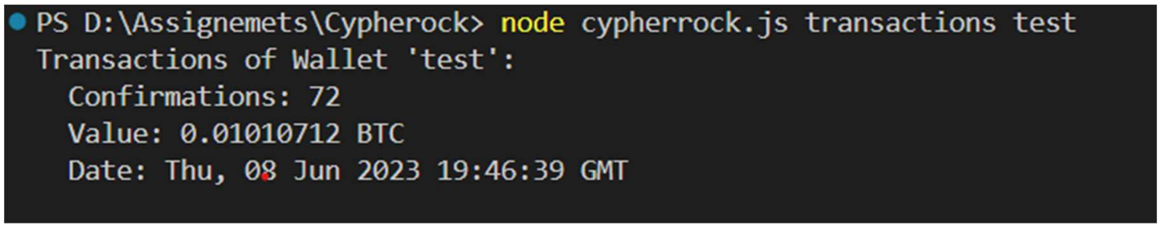
- Getting Bitcoin Balance:
  Write node cypherrock.js balance <wallet_name>



```
PS D:\Assignemets\Cypherock> node cypherrock.js balance test
Balance of Wallet 'test': 0.00008376 BTC
PS D:\Assignemets\Cypherock> 
```

I have sent some testnet btc to this particular address and the transaction function converts the Satoshi into BTC and console in a human readable form

- Getting Bitcoin Transaction:
  Write node cypherrock.js transaction <wallet_name>



```
PS D:\Assignemets\Cypherock> node cypherrock.js transactions test
Transactions of Wallet 'test':
  Confirmations: 72
  Value: 0.01010712 BTC
  Date: Thu, 08 Jun 2023 19:46:39 GMT
```

- Generating an unused bitcoin:
  Write node cypherrock.js generate-address

  Output- *Unused address generated for Wallet 'MyWallet': 1ABCxyz*