

Decentralized Exchange

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About

This is a simple Ethereum based decentralized exchange with a custom token. Decentralized exchange allows for trustless exchange of assets and tokens on Ethereum without giving away control of your assets.

What is an order book?

An order book is a list, typically electronic, of buy (bid) and sell (offer) orders, including the number of shares to be bought or sold. The order book is organized by price level. This helps keep track of the level of interest for a tradable instrument and shows the market depth.

Usage

You need to have a Metamask wallet. Connect to the app using your wallet. When connected, your address will show on the top navigation bar. You can deposit your tokens or ether, create orders by choosing the amount of token you want to get in exchange for the amount of ether or vice versa, or fill open orders to make a trade.

Technology Stack and Tools

- Metamask Wallet
- Truffle - development framework
- React - front end framework
- Redux - front end state management framework
- Solidity - ethereum smart contract language
- Ganache - local blockchain development
- Web3 - library interact with ethereum nodes
- JavaScript - logic front end and testing smart contracts
- Open Zeppelin - smart contract libraries

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Folder / Directory Structure

- Dex
 - migrations
 - public
 - scripts
 - src
 - abis
 - components
 - contracts
 - store
 - Index.js

How to Run

Install dependencies

```
$ npm install
```

Run local blockchain with ganache. Ensure truffle-config.js networks config is your Ganache port. By default it should be host: 127.0.0.1 and port: 7545 or 8545 depending on whether you used GUI or CLI.

```
$ ganache-cli
```

Connect your ganache addresses from the list of given addresses to Metamask by copying the private key and importing these private keys to Metamask.

Compile, Test and Migrate Contracts on Ganache

```
$ truffle compile --all
```

```
$ truffle migrate --reset --network development
```

Load exchange with some initial data, orders, trades, cancels etc

```
$ truffle exec scripts/seed-exchange.js
```

Run app locally

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```
$ npm run start
```

SCENARIO

UNICA is a special Token currently held only by User 1.

User 1 will have both UNICA and ETH in the wallet. User 1 deposits 100 ETH and 100 UNICA into the Exchange.

User 2 and User 3 will not have any UNICA tokens.

User 2 and User 3 each deposit 100 ETH into the exchange.

User 2 wishes to buy a total of 20 UNICA at the rate of 1 ETH per UNICA token. User 2 will place a buy Order.

User 3 wishes to buy a total of 20 UNICA at the rate of 2 ETH per UNICA token. User 3 will place a buy Order.

Now User 1 sees a profitable opportunity by performing a trade with User 3's Buy order. User 1 sells the order. Now, User 1 will receive $20 * 2$ ETH into the account. User 3 will receive the 20 UNICA which was requested.

Decentralized Exchange

DEMO

USER 1 DEPOSITS 100 ETH and 100 UNICA TO EXCHANGE

Exchange

0x7d9b338110a7542df98192986c801ade7d8ee1

Balance

Deposit	Withdraw	
Token	Wallet	Exchange
ETH	899.99	100
UNICA	69999900	100

ETH

Deposit

UNICA

Deposit

New Order

Buy

Sell

Buy Amount (UNICA)

Buy Amount

Buy Price

Buy Price

Buy Order

Order Book

UNICA

UNICA/ETH

ETH

My Transactions

Trades

Orders

Time

UNICA

UNICA/ETH

Trades

Time

UNICA

UNICA/ETH

USER 2 DEPOSITS 100 ETH TO EXCHANGE

Exchange

0x291169A29b6699913de11476422ccha6028b19

Balance

Deposit	Withdraw	
Token	Wallet	Exchange
ETH	900	100
UNICA	0	0

ETH

Deposit

UNICA

Deposit

New Order

Buy

Sell

Buy Amount (UNICA)

Buy Amount

Buy Price

Buy Price

Buy Order

Order Book

UNICA

UNICA/ETH

ETH

My Transactions

Trades

Orders

Time

UNICA

UNICA/ETH

Trades

Time

UNICA

UNICA/ETH

Decentralized Exchange

USER 3 DEPOSITS 100 ETH TO EXCHANGE

Exchange

0x4851E3af47e01B8c4ec462beaf1B79e5E64a2C82

Balance

Deposit	Withdraw	
Token	Wallet	Exchange
ETH	900	100
UNICA	0	0

ETH

Deposit

UNICA

Deposit

New Order

Buy

Sell

Buy Amount (UNICA)

Buy Amount

Buy Price

Buy Price

Buy Order

Order Book

UNICA

UNICA/ETH

ETH

My Transactions

Trades

Orders

Time

UNICA

UNICA/ETH

Time

UNICA

UNICA/ETH

USER 2 PUTS A BUY ORDER , WILLING TO BUY 20 ETH AT THE RATE OF 1 ETH PER UNICA

Exchange

0x2931169A288a6999132e111476422c0ba0D28B19

Balance

Deposit	Withdraw	
Token	Wallet	Exchange
ETH	900	100
UNICA	0	0

ETH

Deposit

UNICA

Deposit

New Order

Buy

Sell

Buy Amount (UNICA)

20

Buy Price

1

Buy Order

Total: 20 ETH

Order Book

UNICA

UNICA/ETH

ETH

My Transactions

Trades

Orders

Time

UNICA

UNICA/ETH

Time

UNICA

UNICA/ETH

Decentralized Exchange

USER 3 PUTS A BUY ORDER , WILLING TO BUY 20 ETH AT THE RATE OF 2 ETH PER UNICA

The screenshot shows a web application for a decentralized exchange. The main interface is divided into several sections:

- Balance:** A table showing the user's balance for ETH and UNICA. ETH balance is 900, and UNICA balance is 0.
- Order Book:** A table showing the current order book. It has columns for UNICA, UNICA/ETH, and ETH. The current order is 20 UNICA at a rate of 2 ETH per UNICA.
- My Transactions:** A table showing the user's transaction history. It has columns for Time, UNICA, and UNICA/ETH.
- New Order:** A form to place a new order. It has fields for Buy Amount (UNICA) and Buy Price. The Buy Amount is set to 20, and the Buy Price is set to 2. A blue button labeled "Buy Order" is visible.
- Gas Fee:** A section showing the gas fee for the transaction. It displays "GAS FEE 0.000505" and "TOTAL 0.000505".

The "New Order" form is highlighted with a red rectangle, indicating the action being performed.

USER 1 SELLS USER 3 ORDER

The screenshot shows the same web application as the previous one, but with a different state. The "Order Book" section is highlighted with a red rectangle, showing the current order book. The current order is 20 UNICA at a rate of 2 ETH per UNICA. The "New Order" form is also visible, but it is not highlighted. The "Gas Fee" section shows a gas fee of 0.000505 and a total of 0.000505. The "My Transactions" section shows a transaction history. The "Trades" section shows a table with columns for Time, UNICA, and UNICA/ETH. The "Balance" section shows the user's balance for ETH and UNICA. The "Order Book" section is highlighted with a red rectangle, indicating the action being performed.

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USER 1 GETS 40 ETH FOR THE TRADE

Exchange 0x7d9b338110A7542DF98192886C801ADE7D6EE1

Balance

Token	Wallet	Exchange
ETH	899.99	140
UNICA	6999900	80

ETH

UNICA

Order Book

UNICA	UNICA/ETH	ETH
20	1	20

My Transactions

Time	UNICA	UNICA/ETH
5:00:39 pm 5/13	-20	2

Trades

Time	UNICA	UNICA/ETH
5:00:39 pm 5/13	20	1

USER 3 GETS THE REQUESTED 20 UNICA

Exchange 0x4801E3d47e0188c4ec462beaf1B79e5E64a2CB2

Balance

Token	Wallet	Exchange
ETH	900	60
UNICA	0	20

ETH

UNICA

Order Book

UNICA	UNICA/ETH	ETH
20	1	20

My Transactions

Time	UNICA	UNICA/ETH
5:00:39 pm 5/13	+20	2

Trades

Time	UNICA	UNICA/ETH
5:00:39 pm 5/13	20	1

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Conclusion

Using the Decentralized exchange, users are able to advertise their buy orders and also get their orders fulfilled.