

Blockchain Training



An initiative of the Lagos State Ministry of Education

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Bitcoin vs Ethereum



Bitcoin vs Ethereum



- Bitcoin was launched with the intention to bypass government regulations and create online payments without the need of an intermediary to confirm transactions
- Ethereum introduced so-called smart contracts and a way to perform actions by the rules defined in the contract

Bitcoin vs Ethereum



- Bitcoin, (capital case) is the blockchain which introduced bitcoin (lower case), the digital currency, that sits on top of the blockchain that cannot be copied, or duplicated
- Ethereum is a blockchain specifically used for smart contract execution, decentralized apps, and autonomous organizations

Trust Issues



- Traditionally, trust between parties has been solved using middlemen, third parties
- A transaction with someone you don't trust would go through an intermediary both parties trust
- Paypal
- Your Banks
- Government

What Happens When Trust is Breached



Global Financial Crisis

- Started in 2007 in the US with the real estate market
- Spread to the rest of the world by 2008
- Some countries went into recession
- The crisis was nonetheless followed by a global economic downturn, the Great Recession

Bitcoin is a Response

- The financial crisis brought out the inherent shortcomings of banks and other financial institutions
- After the financial crisis, people were demanding for a currency that would not be controlled by a central authority
- Bitcoin is a result of that demand
- Ethereum is an improvement on the core idea behind Bitcoin which is the blockchain

Blockchain



- A blockchain is essentially a decentralized distributed database or a ledger
- A database refers to a location for storing durable data that can be accessed at any point in time
- A database allows for the storage and retrieval of data and provides management functionalities to manage data efficiently like export, import, backup and restoration

Distributed Ledger



Everyone in the world has a copy of all the transactions on the blockchain

Blockchain

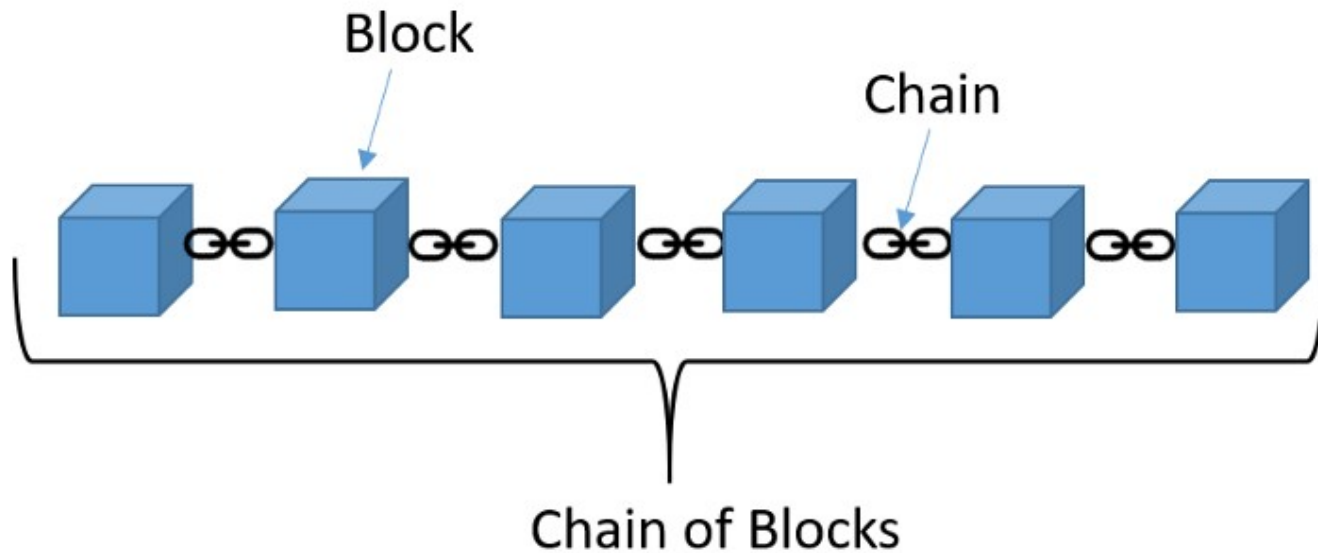


A ledger is a specialized database that does not allow for the modification of existing data

Debit (Expenditure)	Credit (Income)
\$10 Soldier 1	\$10 Doctor
\$5 Hunter 1	\$5 Blacksmith
\$5 Hunter 2	\$5 Blacksmith
\$1 Cook	\$1 Engineer
\$1 Architect	\$1 Engineer
\$1 Doctor	\$1 Engineer
\$1 Gardener	\$1 Engineer
\$1 Soldier 1	\$1 Engineer
\$1 Soldier 2	\$1 Engineer
\$1 Blacksmith	\$1 Engineer
\$1 Hunter 1	\$1 Engineer
\$1 Hunter 2	\$1 Engineer
\$10 Gardener	\$10 Hunter 1
\$5 Gardener	\$5 Hunter 2



Blockchain



Blockchain means having multiple blocks chained together and each block stores transactions in a way that it is not possible to modify these transactions.

Ether



- Ether is the currency of Ethereum
- Ether is what you pay when you program code on Ethereum
- Ether can easily be converted to dollars or other traditional currencies through Crypto-exchanges
- The smallest denomination aka base unit of ether is called Wei

Gas



- This is the internal currency of Ethereum
- It helps to maintain a constant price for Ethereum transactions
- The execution and resource utilization cost is predetermined in Ethereum in terms of Gas units
- It is a unit, which represents the amount paid for code execution

Mining Nodes



- Mine or create a new block with transaction and write the same to Ethereum Ledger
- Advertise and send a newly mined block to other miners.
- To accept new blocks mined by other miners and keep its own ledger instance up-to-date

Accounts



- The basic unit of Ethereum is an account
- Accounts are essential for users to interact with the Ethereum blockchain via transactions.
- We have two types of account: Externally Owned Accounts and Contract Accounts
- Externally Owned Accounts are accounts that are owned by people on Ethereum
- Contracts Accounts contain code for smart contracts

Contract



A contract is a legal document that binds two or more parties who agree to execute a transaction immediately or in future

Smart Contract



A smart contract is a contract implemented, deployed and executed within Ethereum environment

Smart Contracts



- Smart contracts are digitization of the legal contracts
- Smart contracts are deployed, stored and executed within the Ethereum Virtual machine
- Smart contracts can store data

Conclusion



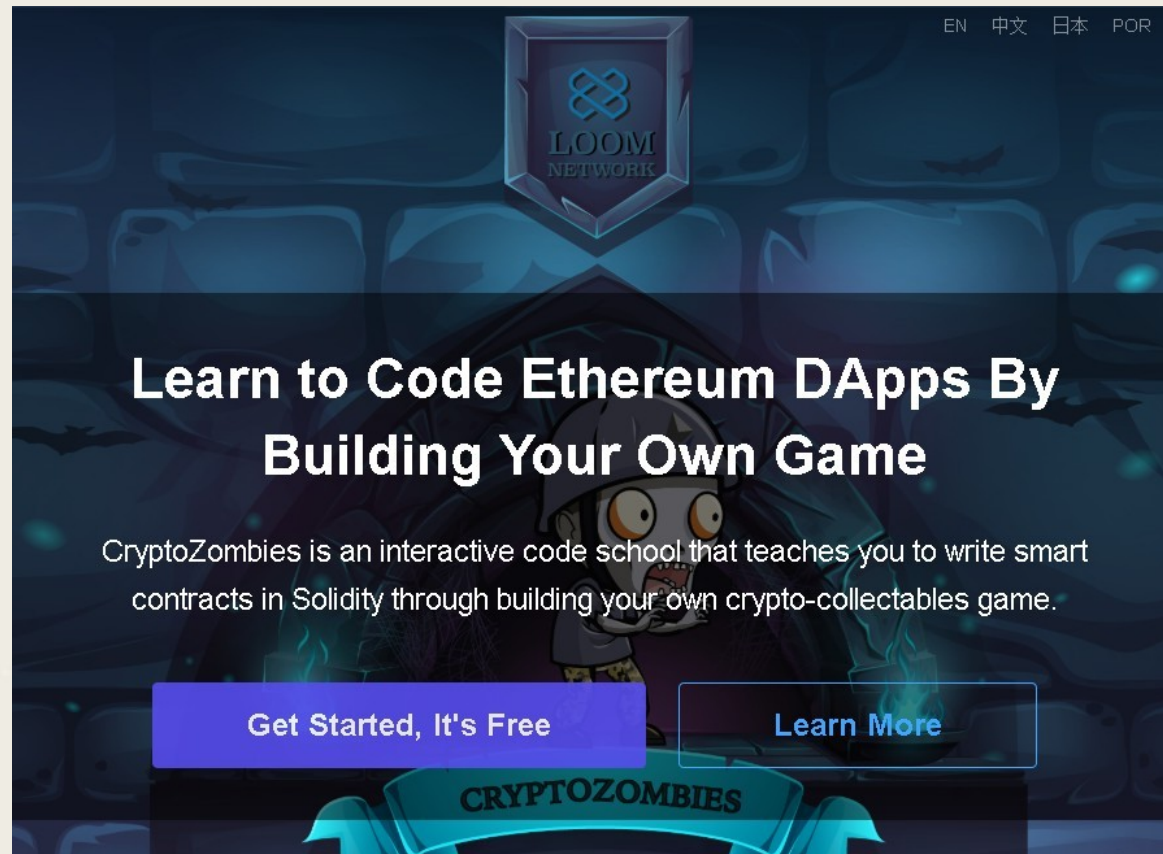
- Bitcoin uses a blockchain that is the basis of the currency
- Ethereum allows for anyone to run code on the blockchain
- Smart contracts are code, which is executed on the computers in the network

Introduction to Solidity



- Solidity is a statically-typed programming language designed for developing smart contracts that run on the EVM
- It is an object oriented language with similarity to JavaScript

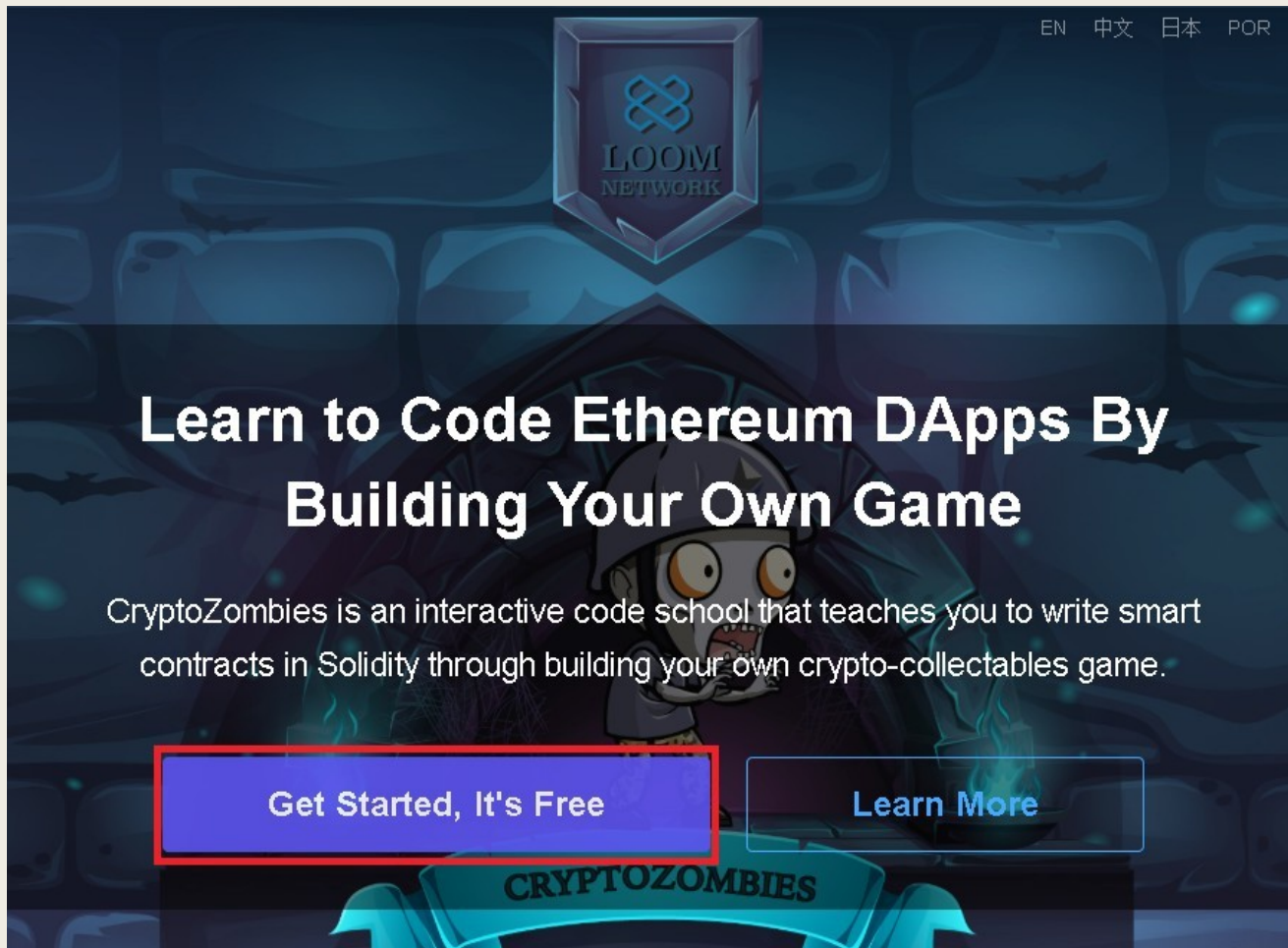
CryptoZombies



<https://cryptozombies.io/>



CryptoZombies



Click the Get Started Button



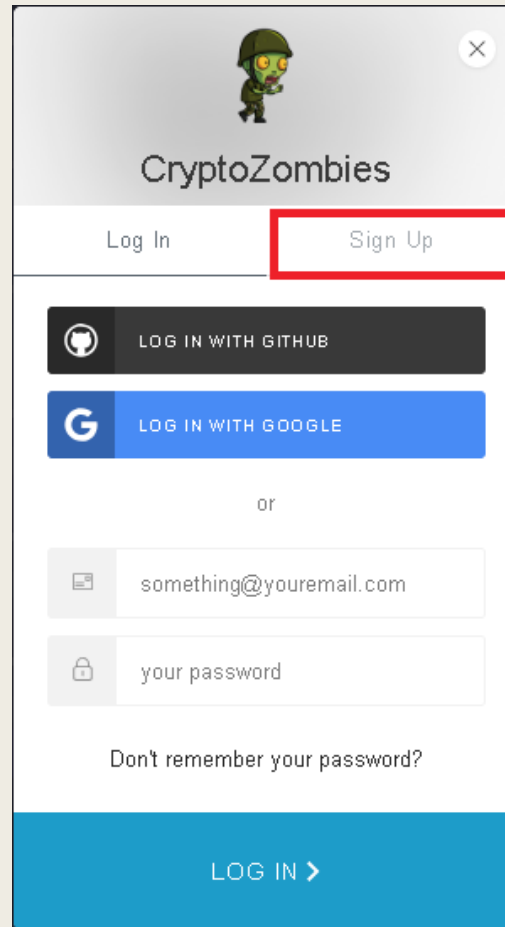
CryptoZombies



Sign in and start



CryptoZombies

A screenshot of a mobile app login/signup modal for "CryptoZombies". At the top is a green zombie icon and a close button (X). Below the app name are two buttons: "Log In" and "Sign Up", with "Sign Up" highlighted by a red rectangle. Underneath are social login options: "LOG IN WITH GITHUB" (black button) and "LOG IN WITH GOOGLE" (blue button). A separator "or" follows. Then are email and password input fields with placeholder text "something@youremail.com" and "your password". Below the password field is a link "Don't remember your password?". At the bottom is a large blue button labeled "LOG IN >".

Click on Sign Up



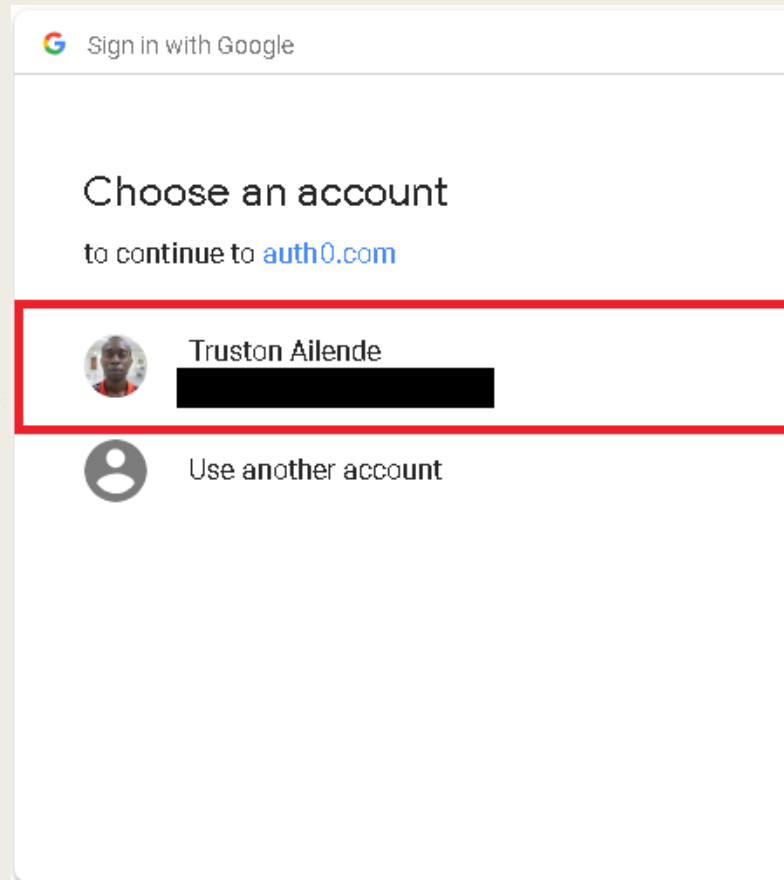
CryptoZombies

A mobile app interface for CryptoZombies. At the top is a green zombie character icon and the text "CryptoZombies". Below this are "Log In" and "Sign Up" links. The "Sign Up" link is selected. There are two buttons for social sign-up: "SIGN UP WITH GITHUB" (black) and "SIGN UP WITH GOOGLE" (blue). The "SIGN UP WITH GOOGLE" button is highlighted with a red border. Below these is an "or" separator. Then there are input fields for email (placeholder: "something@youremail.com"), password (placeholder: "your password"), and a language dropdown (currently set to "English"). At the bottom is a large blue button labeled "SIGN UP >".

Sign Up with Google



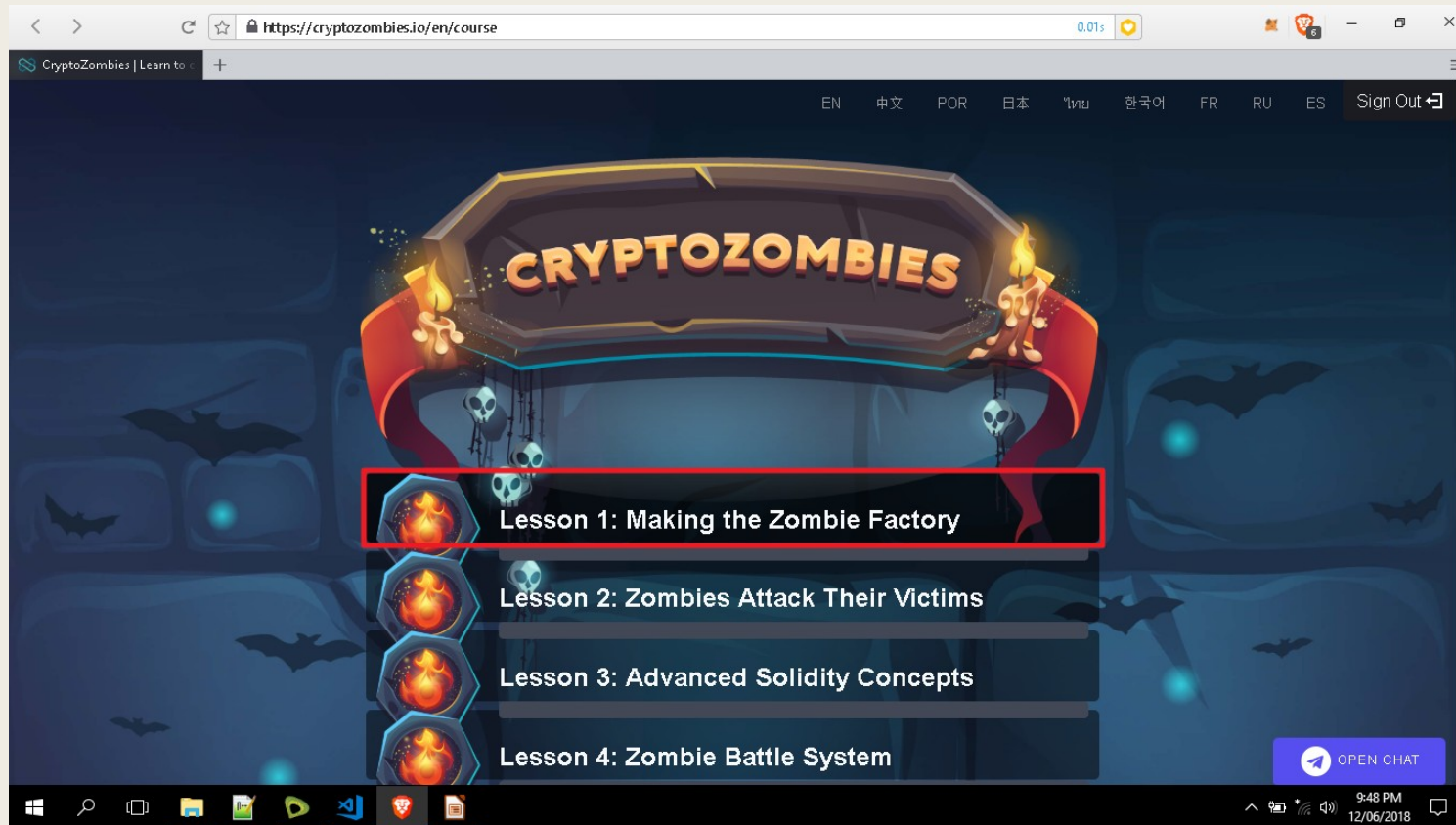
CryptoZombies



Click on Your Account



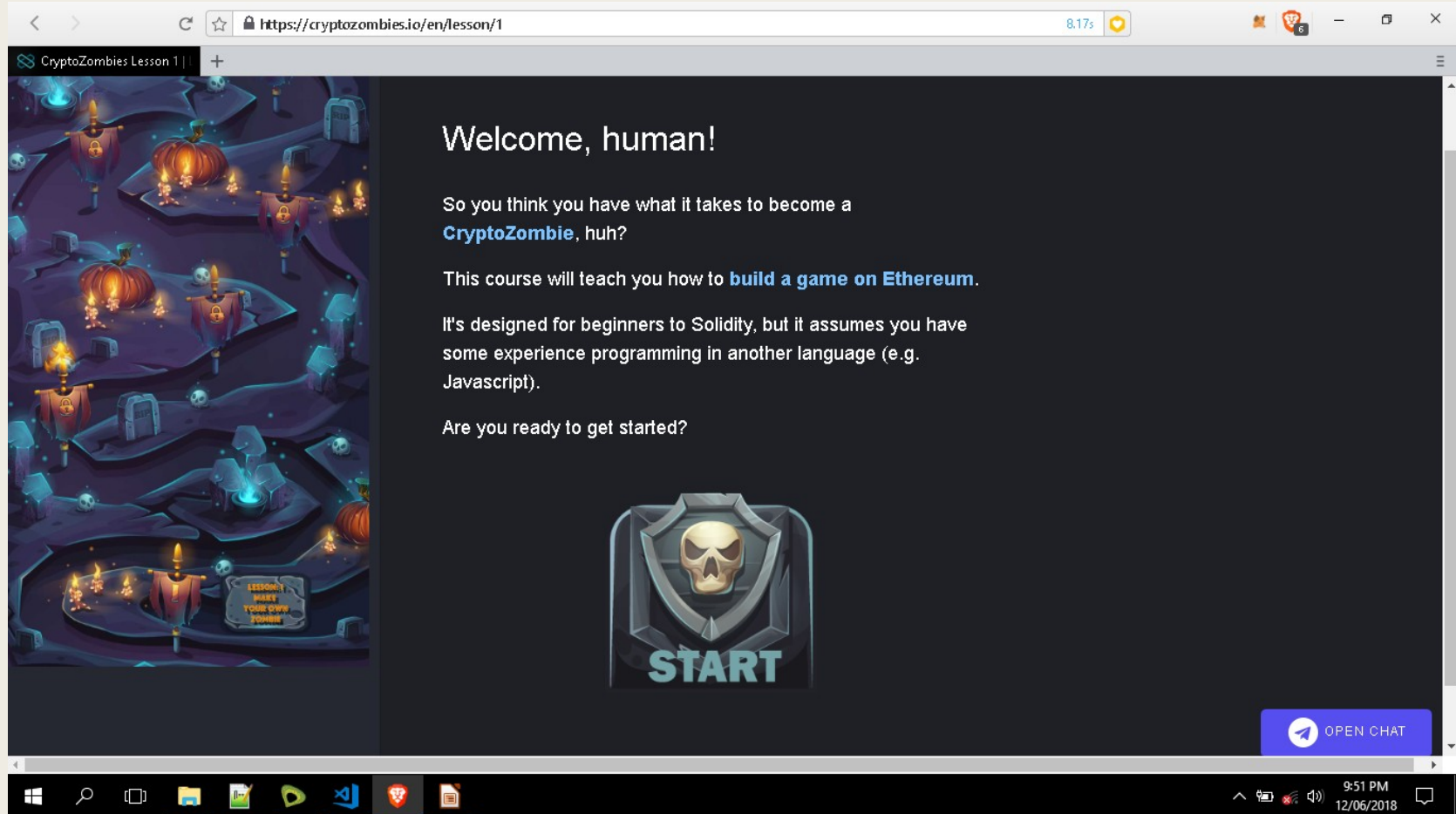
CryptoZombies



Click on the First Lesson to start



CryptoZombies



Start



Conclusion



- At the end of this week, we have covered basic concepts with Ethereum
- The Solidity programming language is the default contract specification language for Ethereum
- The CryptoZombies platform offers a simple and easy way to learn the Solidity programming language
- Ensure to finish CryptoZombies lessons within the next two weeks