

Cryptocurrency & Blockchain



Table of content:

What is the Blockchain and Why?

- What is the Blockchain and Why Use it?
- The Blockchain in Practice: Cryptocurrencies and Cryptography
- The Blockchain in Practice: Mining and Bitcoin
- Roadmap to Building the Blockchain: Guided by the Bitcoin White Paper

Build the Blockchain - Blocks

- Set Up the Blockchain Application
- Create the Block
- Genesis Block
- Mine Blocks
- SHA256 Hash Function

Build the Blockchain - the Chain

- Build the Blockchain Class
- Multiple Chain Validation
- Chain Validation
- Replace the Chain

Develop the Blockchain Application

- Organize the Project
- Blockchain API - Get Blocks
- Mine Blocks Post Request

Create the Blockchain Network

- Peer to Peer Server
- Create the WebSocket Server
- Connect to Blockchain Peers
- Handle Messages from Peers
- Synchronize the Blockchain across Peers

Proof of Work

- Proof of Work and the 51% Attack
- Proof of Work and the Nonce
- Dynamic Block Difficulty

Wallets and Transactions on the Blockchain

- Notes on the Upcoming Cryptocurrency Implementation
- Wallets, Keys, and Transactions
- Create Wallet
- Chain Util and Key Generation
- Create a Transaction
- Sign a Transaction

- Verify Transactions
- Transaction Updates

Collect Transactions in a Pool

- Transaction Pool
- Transaction Pool - Add Transaction
- Create Transactions with the Wallet
- Get Transactions
- Post Transactions
- Add the Transaction Pool to the Peer-to-peer Server
- Handle Transaction Messages in the Peer-to-peer Server
- Public Key Endpoint

Mine Transactions in a Block

- Miners of Transactions
- Create the Miner Class
- Grab Valid Transactions
- Reward Transactions
- Reward Valid, and Clear Transactions
- Broadcast Clear Transactions
- Mine Transactions Endpoint
- The Nuance of Wallet Balance
- Calculate the Wallet Balance
- Calculate the Balance during each Transaction
- The Cryptocurrency in Action

