Intro to Blockchain Programming

By Joe Marron

About Me

4th year Computer Engineering student in TCD [1]

Part-time blockchain developer with Subsocial, building a decentralised social media platform on the Ethereum blockchain
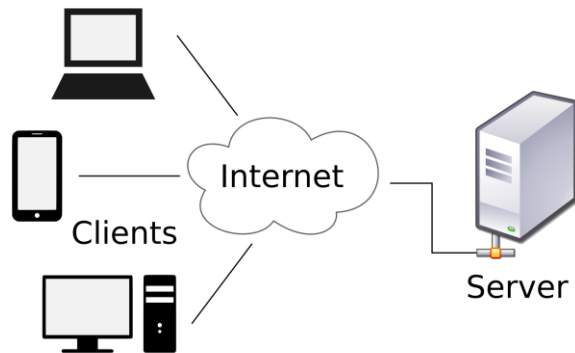
Strong interest in blockchain technology and hoping to inspire others to begin their own journey into the new world of blockchain programming

What is a blockchain ?

Takes a peer-to-peer approach to networking [3]

It differs from the traditional client-server model [2]

Decentralised network where the nodes reach consensus to create blocks and add them to the end of the chain [4]

Internet

Clients

Server

BLOCK 1

BLOCK 2

BLOCK 3

Hash: 6U9P2
Previous hash:
00000

Hash: 8Y5C9
Previous hash:
6U9P2

Hash: 9L4Z1
Previous hash:
8Y5C9
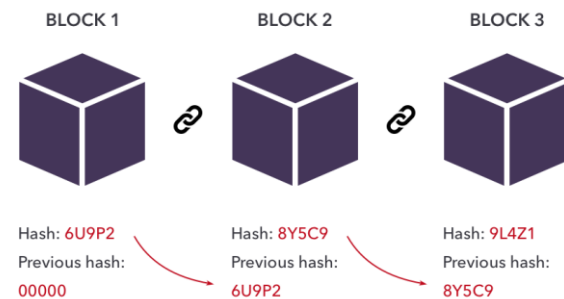
Each block contains a reference to the previous block, similar to a linked list [5]

What Language will we be using?

Solidity

"Solidity is a statically-typed curly-braces programming language designed for developing smart contracts that run on Ethereum" [6]

```
contract HelloWorld{

    function say_hello() public pure returns(string memory){
        return "Hello World!";
    }
}
```

How can I get started in blockchain programming ?

Remix is a browser IDE that allows you to write smart contracts in Solidity and interact with them easily

```solidity
1   // SPDX-License-
2   pragma solidity ^0.
3
4   contract SimpleStorage {
5      uint storedData;
6      address recent;
7      uint time;
8      uint blocknum;
9      uint hash;
10
11     function set(uint x) public {
12        storedData = x;
13        recent = msg.sender;
14        time = block.timestamp;
15        blocknum = block.number;
16     }
17
18     function getData() public view returns (uint) {
19        return storedData;
20     }
21
22     function getAddress() public view returns (address) {
23        return recent;
24     }
25
26     function getTime() public view returns (uint) {
27        return time;
28     }
29
30     function getBlock() public view returns (uint) {
31        return blocknum;
32     }
33   }
```

contracts
  artifacts
  2_Blog.sol
  3_Space.sol
  1_Storage.sol
scripts
tests
README.txt

How to interact with a real-world blockchain using JavaScript

Web3 JavaScript library [7]

https://www.npmjs.com/package/web3

Can we double check if the information we fetch from the blockchain is correct?

YES! https://etherscan.io/

Where to learn more ...

Intro to Solidity playlist (using Remix) https://www.youtube.com/watch?v=IkCfIE1VoRo

Intro series to Web3 JS
https://www.youtube.com/watch?v=t3wM5903ty0&list=PLS5SEs8ZftgXlCGXNfzKdq7nGBcla VOdN

Intro to Truffle smart contract manager

https://www.youtube.com/watch?v=ZaqAwOzEiQ8

Intro to Hardhat smart contract manager (more advanced)

https://www.youtube.com/watch?v=9Qpi80dQsGU

Questions ?

Either ask them now or pop me an email

[8]

Thanks for coming ☺

GitHub repo : https://github.com/marronjo/blockchain-workshop

References (so I don't get in trouble)

[1] TCD Logo https://www.tcd.ie/identity/assets/logos/Logos%20page/jpg/Trinity_Main_Logo.jpg

[2] Client Server Model https://upload.wikimedia.org/wikipedia/commons/thumb/c/c9/Client-server-model.svg/1920px-Client-server-model.svg.png

[3] Peer to Peer Network https://www.breede.co.za/wordpress/wp-content/uploads/2018/06/the-rise-and-rise-of-peer-to-peer-lending.jpg

[4] Blockchain Handshake https://venturebeat.com/wp-content/uploads/2018/01/blockex-blockchain-funding-exchange-platform.jpg?fit=7500%2C3300&strip=all

[5] Block Structure https://a.c-dn.net/c/content/dam/publicsites/igcom/uk/images/ContentImage/IG-What-is-blockchain-technology-Blocks-with-des.png

[6] Solidity Logo https://miro.medium.com/max/4000/0*yqbRlnqX0ZRUlVS0

[7] Web3 JS Library https://www.mycryptopedia.com/wp-content/uploads/2019/04/Web3.js-e1555083881960.jpg

[8] Question https://www.asalesguy.com/wp-content/uploads/2017/08/question.jpeg