**Blockchain using NodeJS and Socket.io**

Blockchain is a decentralized trust based system to transfer and verify the data sent over a network.

**Blockchain 101**

First off Blockchain is not Cryptocurrency.

Blockchain is the technology behind Cryptocurrencies.

An analogy would be how Internet is the technology behind Emails.

It is the process of maintaining a distributed digital ledger which contains a series of records that are linked together and cannot be corrupted.

Well that's a fairly simple definition for a revolutionary technology.

It has disrupted a lot of fields like medicine, logistics, education and finance (majorly).

Let's take a look at the components of a blockchain.

**Components of Blockchain**

Block: It is a collection of data usually capped at an upper limit either by the size or number of data units.

Chain: It is a collection of blocks that are linked together by an algorithm that uses the information of the previous block.

Node: A system in the blockchain that is used to verify the authenticity of blocks as well as maintain the digital ledger that keeps record of all the blocks in chronological order.

**Advanced Blockchain;**

The above are only components that make up the blockchain. What truly makes the blockchain secure are the processes that are involved.

**Mining a block**

Mining is process of generating a new block and adding it to the network.

It involves two processes;

**Proof of Work Generation:**

As mentioned earlier, blocks are linked using an algorithm that makes use of the information of the previous block to generate the next block.

This algorithm is known as proof of work, generally designed in such a way that output is hard to generate, but fairly easy to verify its output.

**Proof of Work Verification:**

When one of the nodes in the network successfully generates the block, the rest of nodes in the network must verify the authenticity of the proof and chain.

So the nodes verify whether the proof is right and checks the authenticity of the chain. If everything is alright, the block is mined and all other nodes update their ledger to include the newly mined block.

**Event Flow of Blockchain**

Let's look at how the events unfold when you add data to a blockchain.

A request to exchange data is received from the sender to one of the nodes in the chain.

The node then broadcasts to other nodes about the incoming data and adds it to the current transaction pool.

Once the limit of the block is reached (size or number of units), the nodes start mining the block.

The nodes compete against each other to find a proof of work solution.

When one of the nodes succeeds in mining it broadcasts the solution.

The other nodes then verify the output and check whether it’s valid.

Then they verify the blocks of the chain and add the newly mined block.