**Ethereum Developer Degree**

**Topic 1: How to get started with programming**

**##W3C** – World Wide Web Consortium sets programming standards and explicit rules for building web browsers

**##**The web standards are set around HTML, CSS, JS

**Topic 2: What is blockchain?**

**##** Block chain is a distributed digital immutable ledger used to record transactions and store data in a secure and transparent manner.

## It is based on a decentralized network of nodes that collectively maintain a single of source of truth allowing participants to interact with the system without the need for intermediaries

## Block is a container data structure that aggregates transactions for inclusion in the public ledger – the blockchain. Each block in the chain contains a set of transactions that have been verified and recorded by the network of nodes through a process known as **consensus**

## Once a block is added to the chain, it cannot be altered or deleted, creating an immutable record of all transactions on the network

## **Bitcoin** is a crypto network, and it handles the transfer of the BTC asset across the network, without a trusted middleman or authority, ensuring the network itself is secure and cannot be hacked

**State management in blockchain**

## Blockchain starts with a Genesis state when they launch

## Every transaction on a blockchain modifies the global state that is replicated across all nodes

## Since there are millions of transactions, the transactions get grouped together in blocks, hence the name **“Blockchain”**

**##** The blocks are chained together in a cryptographically verifiable way so they are historically traceable

## Current state of a network can be recalculated at any time by starting from the genesis block, transitioning the state according to each block’s information

**Nodes**

## Block Chain network is managed autonomously through a peer-to-peer distributed network of computer **nodes**.

## **Mining Node** is responsible for grouping together new transactions being made on a network into a block, verifying them, and proposing the block to be included onto the global ledger by everyone else.

**Decentralization**

## Blockchain is considered a decentralized network because it stores data in a p2p network of nodes

Benefits of Decentralization:

$ No censorship

$ No downtime as the overall network is running across 1000s of nodes across the globe

$ Highly attack resistant making it infeasible to manipulate or destroy data

**Use Cases of Blockchain**

$ Cryptocurrency

$ Smart contracts

4 DeFi

$ Gaming

$ Supply Chain Tracking

4 Counterfeit Protection

$ Data Privacy

$ Decentralized Governance

$ Voting

$ Verifiable ownership of assets