LEARNING HYPERLEDGER

1. Introduction to H.L Blockchain Technologies

- Distributed Ledger Technology (DLT)

DL → a data structure residing over multiple computer devices, can be spread across locations or regions

3 components:

1. Data Model to capture current state of ledger
2. Language of transactions to change ledger state
3. Protocol to build consensus on which txns. will be accepted, in what order, by the ledger

examples of DLTs → block chain, chain core, Corda, quorum, IOTA

- Blockchain → P2P DL, forged by consensus, combined with a system for smart contracts & other assistive technologies
- Smart Contracts → Programs which execute predefined actions when certain conditions within the system are met.
- Consensus → System ensuring that parties agree to a certain state of the system as the true state.
- Block → a set of txns bundled together, added to the chain at the same time
- Timestamping → Each block is timestamped, every new block refers to the previous block. With timestamps + cryptographic hashes → the chain provides an immutable record of all txns, from the 1st (genesis) block.

Blockchain → miner nodes bundle valid + unconfirmed txns into a block. Each block contains a certain no of txns. On Bitcoin, miners solve a cryptographic challenge to propose the next block → This is PROOF OF WORK

Bitcoin Blockchain Block:

- reference to previous block
- Timestamp
- PoW or nonce
- Merklee tree root for txns in the block

- Merkle Tree / Binary Hash Tree
  → a data str. used to store hashes of individual data in large datasets, & allow efficient verification of the dataset. Its an anti tamper mechanism to ensure the dataset hasn't been changed