Name: Pranali Unavane

Task - 2

- Comparison between Ethereum, Hyperledger Fabric and R3 Corda:

Features / Blockchain Name	Ethereum	Hyperledger Fabric	R3 Corda
Type of Blockchain	Public	Private	Consortium
Consensus Mechanism Used	Proof of Stake (PoS)	Pluggable (e.g., Raft, Kafka)	Notary-based (Raft, BFT, CFT)
Permission Model (Open / Permissioned)	Open	Permissioned	Permissioned
Speed Throughput (TPS if available)	~30 TPS (base layer), scalable via Layer 2s	1,000+ TPS (depends on setup)	~100–200 TPS
Smart Contract Support (Y/ N + Language)	Yes (Solidity, Vyper)	Yes (Chaincode - Go, Java, Node.js)	Yes (Java, Kotlin)

Token Support (Native or not)	Native (ETH)	No native token	No native token
Typical Use Case	DApps, NFTs, DeFi, DAO	Supply chain, banking, and healthcare	Interbank settlements, trade finance, KYC sharing
Notable Technical Feature (e.g., privacy, pluggable consensus)	Pluggable with Layer 2s (rollups, zk tech) for scalability and privacy add-ons, Ethereum Virtual Machine (EVM)	Pluggable consensus, private channels	Point-to-point privacy & pluggable notary-based consensus (Raft/BFT)

❖ Compare and contrast the technical capabilities of each:

- Ethereum operates as a decentralized, public blockchain known for its robust support for smart contracts and decentralized applications (DApps). It currently uses a Proof-of-Stake (PoS) consensus mechanism, which significantly reduces energy consumption compared to Proof-of-Work. Ethereum supports Solidity and Vyper for contract development and has a rich ecosystem of tools and Layer 2 solutions to address its base-layer TPS limitation (~30 TPS). Its open permission model fosters transparency but lacks built-in privacy or access control, making it ideal for use cases that prioritize decentralization over confidentiality.

- Hyperledger Fabric, by contrast, is a permissioned, private blockchain platform tailored for enterprise needs. It supports pluggable consensus (e.g., Raft) and delivers high throughput (1000+ TPS) due to its modular architecture. Its smart contract engine, called Chaincode, supports mainstream languages like Go, Java, and JavaScript. Fabric emphasizes privacy through data channels and private collections, making it highly suitable for supply chain and business process automation where participants are known and need granular access controls.

- R3 Corda, a consortium blockchain platform, is designed for regulated environments such as financial institutions. It uses a notary-based consensus mechanism (Raft or BFT) to prevent double spending and ensures privacy through point-to-point communication instead of global broadcasting. Corda supports smart contracts written in JVM languages like Kotlin and Java but lacks native token functionality. Its architecture aligns with financial applications where transaction confidentiality, identity management, and compliance are critical.

❖ Platform Recommendations:

- For a decentralized app (DApp), Ethereum is the most appropriate due to its public nature, smart contract flexibility, and wide adoption.
- For a supply chain network among known partners, Hyperledger Fabric is ideal given its high throughput, modular architecture, and permissioned access controls.
- For an inter-bank financial application, R3 Corda stands out with its privacy-preserving, legally expressive contract model tailored for financial workflows.
- Each platform brings specific strengths to the table, and selecting the right one depends on the project's need for openness, privacy, performance, and governance.