Mini Task 2

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Blockchain Name	Type	Consensus Mechanism	Permission Model	Speed / Throughput	Smart Contract Support	Token Support	Typical Use Case	Notable Technical Feature
Ethereum	Public	Proof of Stake (PoS)	Open	~15–45 TPS	Yes – Solidity, Vyper	Native ETH; ERC-20/ERC-721	Decentralized apps (DeFi, NFTs)	Fully decentralized, rich tooling (EVM)
Hyperledger Fabric	Private	Pluggable (default: Raft)	Permissioned	500–3,500 + TPS (channel-dependent)	Yes – Chaincode (Go, Java, JavaScript)	No native token (can be added)	Enterprise supply chains, trade finance	Channel-based privacy; modular architecture
R3 Corda	Consortium	Raft, BFT (optional)	Permissioned	~200–2,000 TPS (depends on deployment)	Yes – CorDapps (Kotlin, Java)	No native token (digital assets via CorDapp)	Inter-bank settlements, syndicated loans	Point-to-point privacy; not a full ledger

1. Ethereum

Ethereum is a fully public, permissionless blockchain that transitioned to Proof of Stake (PoS) consensus with “The Merge,” enabling validators to secure the network by locking up ETH rather than expending energy. Transactions and smart contract executions on Ethereum are globally broadcast and settled on a single shared ledger, which currently processes approximately 15–45 transactions per second, though Layer 2 scaling solutions (e.g., rollups) are widely adopted to boost throughput. Its native cryptocurrency, ETH, underpins all operations—from gas

fees to staking rewards—and a rich token ecosystem (ERC‑20 fungible tokens, ERC‑721/ERC‑1155 NFTs) thrives atop its Ethereum Virtual Machine (EVM). Developers write smart contracts in Solidity or Vyper, benefiting from mature tooling (Hardhat, Truffle) and extensive community resources. Ethereum's openness and decentralization make it the go‑to platform for DeFi protocols, NFT marketplaces, DAOs, and other censorship‑resistant dApps.

2. Hyperledger Fabric

Hyperledger Fabric is a modular, permissioned blockchain framework designed for enterprise consortiums that require fine‑grained control over data visibility and network governance. It employs a pluggable consensus architecture—most commonly Raft in production environments—that orders transactions off‑chain, delivers high throughput (500–3,500+ TPS per channel), and then validates and commits them to peer‑maintained ledgers. Fabric's channel mechanism partitions the network into sub‑ledgers, ensuring that only authorized organizations see relevant data. Chaincode (Fabric's term for smart contracts) can be implemented in Go, Java, or JavaScript, allowing firms to leverage existing development skills and integrate with legacy systems. Fabric does not impose a native token, simplifying compliance and accounting, and is widely used in supply chain tracking, trade finance, and inter‑organizational data sharing where privacy, flexibility, and performance are paramount.

3. R3 Corda

R3 Corda is a permissioned distributed ledger platform tailored for regulated financial institutions and consortia that need strict data confidentiality and legal certainty. Unlike blockchains with global state, Corda executes transactions peer‑to‑peer, sharing data only with parties directly involved in a transaction, which enhances privacy and reduces unnecessary data exposure. Consensus is decoupled into two stages—validity (via a notary service, using Raft or BFT) and uniqueness (preventing double‑spends)—enabling settlement speeds of roughly 200–2,000 TPS, depending on deployment and notary topology. CorDapps, Corda's smart contracts, are authored in Kotlin or Java and can encode legally binding agreements. Without a built‑in cryptocurrency, Corda models digital assets via state objects and token SDKs. Its architecture and legal‑framework integration make it ideal for inter‑bank payments, syndicated lending, and capital markets operations where regulatory compliance, transaction finality, and data privacy are critical.

- **Decentralized app**: **Ethereum**, because it provides the richest on-chain ecosystem, EVM compatibility, and open participation.

- **Supply chain network among known partners**: **Hyperledger Fabric**, due to its channel-based privacy, modular consensus and absence of a native token (simplifying regulatory compliance).

- **Inter-bank financial application**: **R3 Corda**, for its peer-to-peer privacy model, designed legal agreements, and consensus options tailored to high-value, regulated transactions.