

Task Overview:

Choose one platform from each category:

- **Public Blockchain:** (e.g., Ethereum, Bitcoin, Solana)
- **Private Blockchain:** (e.g., Hyperledger Fabric, R3 Corda in private mode)
- **Consortium Blockchain:** (e.g., R3 Corda, Quorum, IBM Food Trust)

Instructions:

1. Create a comparison table or markdown sheet with the following columns for each platform:

Attribute	Ethereum	Hyperledger Fabric	Quorum
Type	Public Blockchain – Anyone can join, validate, and interact with the network.	Private Blockchain – Access is controlled and limited to approved participants.	Consortium Blockchain – Operated by a group of institutions sharing control over the network.
Consensus Mechanism	Proof of Stake (PoS) – Validators stake ETH to propose and confirm blocks. Energy efficient.	Pluggable Consensus – Supports RAFT, Kafka, and BFT, customizable based on network needs.	Istanbul BFT / Raft – Fast consensus mechanisms tailored for permissioned networks.
Permission Model	Open – No approval needed to join or interact. Truly decentralized.	Permissioned – Only trusted identities can join, submit transactions, or access ledgers.	Permissioned – Only selected participants can access or validate data, increasing privacy.
Speed / Throughput (TPS)	~30 TPS on Layer 1 (base chain). Can scale using Layer 2s like Rollups (up to 1000s TPS).	~1000+ TPS, depending on configuration and hardware. Very high throughput ideal for enterprises.	~100–1000 TPS depending on consensus and network configuration. Higher than public chains.

Smart Contract Support	Yes – Uses Solidity and Vyper. Rich ecosystem of tools and frameworks (e.g., Truffle).	Yes – Supports smart contracts (called chaincode) in Go, Java, and Node.js.	Yes – Uses Solidity, similar to Ethereum for compatibility.
Token Support	Native ETH token; supports ERC-20, ERC-721, and other standards.	No native token – Typically used for business processes without cryptocurrency.	Optional – Can use ETH or custom tokens; no native cryptocurrency by default.
Typical Use Case	DeFi, NFTs, DAOs, DApps, global decentralized systems.	Supply chain, healthcare, financial services, identity management in trusted environments.	Financial agreements, interbank transfers, regulated digital asset exchanges, enterprise use.
Notable Technical Feature	Decentralized, massive developer community, EVM-compatible, Layer 2 support.	Modular design, channels for private transactions, enterprise-grade security, flexible governance.	Privacy-enabled Ethereum fork, enterprise-optimized, supports private smart contract execution.

2.Short Report :

- Compare and contrast the **technical capabilities** of each.
- Which platform would you choose for:
 - A decentralized app?
 - A supply chain network among known partners?
 - An inter-bank financial application?
- Justify your choice based on technical points.

Ethereum, Hyperledger Fabric, and Quorum differ significantly in their technical architecture and capabilities.

Ethereum, a public blockchain, supports smart contracts using Solidity and offers decentralized, permissionless access. Its Proof of Stake consensus ensures network security and decentralization, though base layer throughput is limited (~30 TPS), often requiring Layer 2 scaling for high-performance apps.

Hyperledger Fabric, on the other hand, is a modular private blockchain supporting pluggable consensus and high throughput (~1000+ TPS). It enables private channels and fine-grained access control, making it ideal for enterprise use cases where privacy, performance, and permissioning are critical.

Quorum bridges the gap as a consortium blockchain, leveraging Ethereum's smart contract capabilities while enhancing privacy and speed through Istanbul BFT and private transaction support.

Platform Choices:

- Decentralized app: *Ethereum* – Open, secure, and decentralized with smart contract flexibility.
- Supply chain network among known partners: *Hyperledger Fabric* – Strong privacy, scalability, and enterprise tools.
- Inter-bank financial application: *Quorum* – Combines Ethereum compatibility with private, fast, and auditable transactions.

Each choice aligns with the technical strengths required by its respective application scenario.