Mini Task 2: Different Types of Blockchain
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1. Comparison table between different types of Blockchain

Blockchain Name	Ethereum	Hyperledger fabric	Quorum
Type	Public	Private	Consortium
Consensus Mechanism Used	Proof of Stake(PoS)	Raft consensus protocol, Kafka	Raft, Istanbul BFT , Quorum-Chain
Permission Model	Open	Permissioned	Permissioned
Transaction Speed (in TPS)	15-30	20000	150+
Smart Contract Support	Yes (Solidity, Vyper)	Yes (Go, JavaScript, Java)	Yes (Solidity, with privacy enhancements)
Token Support	Native(ETH) + ERC-20, ERC-721	No Native token	No Native token
Typical Use Case	DeFi, NFTs, dAPPs	Enterprise B2B (Supply chain, healthcare)	Interbank Settlements, Private Financial Transactions
Notable Technical Feature	EVM compatibility, large developer ecosystem	Channels for private data segregation	Privacy via Tessera (private transactions)

2. Technical Capabilities Comparison

Ethereum, Hyperledger Fabric, and Quorum differ significantly in their technical capabilities. Ethereum is a public, permissionless blockchain focused on decentralized applications and smart contracts, known for its robust smart contract engine and extensive ecosystem. Hyperledger Fabric is a permissioned, modular blockchain designed for enterprise applications, emphasizing privacy and scalability through fine-grained access control and customizable consensus mechanisms. Quorum, built upon Ethereum's infrastructure, offers private

transactions and smart contracts within a consortium network, balancing the flexibility of Ethereum with the privacy and control of Fabric.

<u>Ethereum:</u>

Public and Permissionless: Open to anyone, allowing for a decentralized ecosystem.
Strong Smart Contract Engine: Solidity programming language and extensive tools for building decentralized applications (DApps).
Decentralized Applications (DApps): Well-suited for innovative financial solutions like DeFi, NFTs, and tokenization.
Scalability Issues: Struggles with high transaction speeds and network congestion in the public network.

<u>Hyperledger Fabric:</u>

Permissioned and Modular: Suitable for enterprise use cases where privacy and control are crucial.
Fine-grained Access Control: Allows for controlled access to the network and data, enhancing privacy.
High Transaction Throughput: Can handle faster transactions due to its permissioned nature and customized consensus mechanisms.
Modular Architecture: Offers flexibility and customization, allowing for tailored solutions for specific business needs.

<u>Quorum:</u>
Semi-Private Blockchain: Consortium-based, allowing for collaboration within a controlled user group.
Private Transactions and Smart Contracts: Enables private data exchange and secure agreements.
Higher Performance: Offers faster transaction speeds and higher throughput compared to public Ethereum.
Consensus Mechanisms: Offers alternative consensus mechanisms beyond Proof-of-Work/Stake, suitable for consortium chains.

Platform Recommendations:

Decentralized App (dApp) → Ethereum

Why? EVM compatibility, open access, and token support (ERC-20) are critical for DeFi/NFTs. Layer-2 solutions (e.g., Arbitrum) can mitigate scalability issues.

Supply Chain Network → Hyperledger Fabric

Why? Channels enable selective data sharing among partners, while high TPS suits logistics tracking. No need for public tokenization.

Inter-Bank Financial Application → Quorum

Why? Combines Ethereum's smart contracts with transaction privacy (Tessera) and finality (Istanbul BFT), ensuring compliance and auditability.