BLOCKCHAIN ASSIGNMENT TASK 2

1.Create a comparison table for one platform from each blockchain category (Public, Private, Consortium)

Blockchain Name	Type	Consensus Mechanism Used	Permission Model	Speed / Throughput (TPS)	Smart Contract Support	Token Support	Typical Use Case	Notable Technical Feature
Ethereum	Public	Proof of Stake (Ethereum 2.0)	Open	~15–30 TPS	Yes (Solidity, Vyper)	Native (ETH)	Decentralized finance (DeFi), NFTs	EVM compatibility, large developer base
Hyperledger Fabric	Private	Pluggable (Raft, Kafka, etc.)	Permissioned	~1,000+ TPS	Yes (Go, JavaScript, Java)	No native token	Enterprise supply chains, trade finance	Modular architecture, private transactions
Quorum	Consortium	Istanbul BFT / Raft	Permissioned	~100–200 TPS	Yes (Solidity - EVM compatible)	Optional tokenization	Interbank payments, enterprise asset tracking	Enhanced privacy, enterprise-ready Ethereum

2.Write a short report (150–200 words) comparing and contrasting the technical capabilities of each platform

Short Report: Technical Comparison of Blockchain Platforms

A comparative analysis of Ethereum, Hyperledger Fabric, and Quorum, representing public, private, and consortium blockchains respectively.

Ethereum is a public blockchain emphasizing decentralization and transparency. It operates on a Proof of Stake (PoS) consensus mechanism, making it more energy-efficient. Although Ethereum supports powerful smart contracts via Solidity, its transaction speed is limited (~15–30 TPS), which may restrict scalability in high-volume applications. It has native token support (ETH), making it suitable for decentralized finance and NFT use cases.

Hyperledger Fabric is a private, permissioned blockchain designed for enterprise environments. It supports modular and pluggable consensus mechanisms (e.g., Raft, Kafka), and achieves a high throughput of 1,000+ TPS. It allows smart contracts in Go, Java, and

JavaScript but does not support native tokens. Its ability to create private channels between organizations makes it ideal for applications like supply chain and finance where data privacy is critical.

Quorum, a consortium blockchain built on Ethereum, offers the benefits of both public and private chains. It uses consensus mechanisms like Istanbul BFT and Raft, supporting 100–200 TPS. It maintains smart contract compatibility while enhancing privacy and performance, making it well-suited for inter-bank and collaborative enterprise applications.

3.Which platform would you choose for the following use cases? Justify your choice based on technical points.

(a) A Decentralized App → Chosen Platform: Ethereum

Justification:
Ethereum is designed for open access and has the largest ecosystem for decentralized apps (DApps). It supports complex smart contracts using Solidity and allows direct interaction with a global user base. Though its Layer 1 TPS is low, Layer 2 scaling solutions help improve performance. Its native token (ETH) also supports financial operations within DApps.

(b) A Supply Chain Network Among Known Partners → Chosen Platform: Hyperledger Fabric

Justification:
Hyperledger Fabric is ideal for environments where all participants are identified and trusted. Its permissioned architecture allows fine-grained control over data access. Fabric supports high throughput and private communication channels, which are essential for maintaining confidentiality and integrity in a supply chain among known entities.

(c) An Inter-Bank Financial Application → Chosen Platform: Quorum

Justification:
Quorum is designed to serve enterprise and financial sectors that require both privacy and transparency. It supports private transactions, customizable consensus mechanisms (Istanbul BFT, Raft), and EVM-compatible smart contracts. Its architecture fits well with the needs of inter-bank settlements, which demand reliability, controlled access, and efficient transaction processing.