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

| **Type** | Public Blockchain | Private Blockchain | Consortium Blockchain |
| --- | --- | --- | --- |
| **Blockchain Name** | Ethereum | Hyperledger Fabric | R3 Corda |
| **Consensus Mechanism Used** | Proof of Stake | RAFT | Notaries |
| **Permission Mode**l | Open | Permissioned | Permissioned |
| **Speed / Throughput** | Roughly 15 TPS | 3000 TPS | 1 million transactions daily across various sectors, including tokenized real-world assets |
| **Token Support (Native or not)** | Yes Ether(ETH) | No, but allows users to create or manage their own custom tokens representing assets using chaincode | No, Corda does not support creation and use of custom tokens. While it focuses on the execution of smart contracts and exchange of assets. |
| **Typical Use Case** | DApp - Decentralized Social Media Platform, Decentralized Financial Application | A single organization - Identity Management, Banking. | Group of Organizations - Supply Chain, HealthCare. |
| **Notable Technical Feature (e.g., privacy, pluggable consensus)** | 1. Smart Contracts 2. Decentralized Application(DApps) 3. Decentralized Autonomous Organization(DAO) 4. Open-Source nature 5. Scalability 6. Solutions 7. Programmability 8. Security | 1. Chaincode 2. Modular Architecture 3. Identity Management 4. Scalability 5. Privacy and Confidentiality 6. Performance 7. Consensus Algorithms 8. Rich Queries 9. Hardware Security Model | 1. Smart contracts written in Java or Kotlin and a flow framework to automate business processes 2. Privacy 3. Interoperability 4. Flow Framework 5. Notary Service 6. Identity Services 7. Network Map Service 8. Pluggable Consensus 9. Oracles 10. Governance 11. Scalability 12. Security |

1. **Write a Short Report -** Compare and contrast the **technical capabilities** of each

* A decentralized app?
* For building a decentralized app I will be using Ethereum public blockchain if the users who are using it caters globally and also Ethereum is the most widely used for dApp development.
* A decentralized app works on smart contract logic and the access is open to anyone. Anyone can deploy or interact with the smart contract.
* In blockchain critical data is stored in the network and other large files are stored in IPFS.
* Mature ecosystem consisting of Solidity, HardHat, Truffle, Metamask, Infura.
* Large open-source community and developer support.
* Data stored in blockchain is transparent and immutable.
* Uses wallet based authentication.
* Due to this immutability contract upgrades are difficult.
* DApp performance is limited as 15 transactions can be processed per second and also costly
* Consensus mechanism used is Proof of Stake(PoS) with economic incentives to validators.
* A supply chain network among known partners?
  + For building a network with known partners I am choosing Hyperledger Fabric blockchain.
  + Permissioned access for all the partners in the network limiting access to the public.
  + Secured and private data storage allowing only the network participants to access the data.
  + Uses RAFT which is the default consensus mechanism in Fabric. Here a leader proposes the block and all nodes will participate in consensus.
  + High TPS as only fewer organizations or nodes are present.
  + Chaincode is used to define the logic of the network where a single chaincode can contain multiple smart contracts.
  + Designed for enterprises.
  + Centralised as one organisation sets the rules.
* An interbank financial application?
  + For building an inter-bank financial application I choose Consortium blockchain as multiple organizations are part of the network and everyone needs a shared access.
  + Only participating banks have access to the data stored in the network.
  + All participants agree upon the same rules, allowing shared governance so there is no centralisation as in Private blockchain.
  + Due to this trust is more.
  + Due to strong rules and consensus like PBFT it is highly secured which is a must for financial application.
  + Consortium supports private transactions and access policies required for banking regulations (KYC, AML, etc.).
  + Faster and more predictable, scalable enough for interbank settlements.
  + Smart contracts are customizable and access controlled and can be upgraded with multi-party agreement.
  + The network is the best balance between transparency and control, and supports real-time auditing by regulators.
  + Provides high performance and low cost.