# Summary of the Project

# METHODOLOGY AND WORKING

- **Food Entry into Blockchain:**
- Stakeholders (farmers, processors, distributors) input food data (e.g., origin, quality, processing) into a blockchain system.
- **Immutable Record Creation:**
- Once the data is entered, it is recorded in blocks. Each block is timestamped and linked to the previous block, ensuring immutability.
- **Smart Contract Execution:**
- Smart contracts ensure that specific rules (e.g., proper storage conditions) are enforced by automatically validating and executing transactions.

**•Blockchain for Transparency:**
•Consumers can scan QR codes to access the full traceability of the product, including its origin, handling conditions, and certifications, ensuring transparency.

**•Data Query and Validation Using Python:**
•Python scripts can be used to query the blockchain for food data. For example, fetching product details using the Ethereum network and smart contracts.

**Consumer Access and Transparency:**
•Develop a web or mobile application that consumers can use to scan QR codes or use RFID/NFC to access the full journey of the food.

•Blockchain ensures that the data displayed is tamper-proof and transparent.

•**Choose a Blockchain Platform:**
•Use a blockchain framework like **Hyperledger Fabric**, **Ethereum**, or **Binance Smart Chain** for building a decentralized ledger.
•Python libraries like **web3.py** for Ethereum can be used to interact with blockchain nodes.
•**Smart Contract Development:**
•Create smart contracts to define how food data is added, verified, and queried. Smart contracts ensure the integrity of the data added to the blockchain.
•Use **Solidity** (for Ethereum) to write the smart contract.

**•Data Collection and Upload:**
•Each stakeholder will input food-related data (e.g., production date, location, certifications) to the blockchain through an interface (API or web app).
•Sensors and IoT devices can be integrated to automatically update the blockchain with environmental conditions like temperature, humidity, etc.
**•Consensus Mechanism:**
•Implement a consensus algorithm like **Proof of Work (PoW)**, **Proof of Stake (PoS)**, or **Practical Byzantine Fault Tolerance (PBFT)** to validate transactions on the blockchain.
•For private blockchains, PBFT is generally more efficient for food traceability use cases.