COURSE CODE: (DJS22ADL7013)

COURSE NAME: Blockchain Technology Laboratory CLASS: B.Tech

EXPERIMENT NO. 1

CO/LO: Describe basic knowledge of Blockchain technology.

AIM / OBJECTIVE: Write a case study on a real-world problem using blockchain

DESCRIPTION OF EXPERIMENT:

This case study illustrates how blockchain technology addresses real-world challenges such as data tampering, lack of transparency, and inefficiency in traditional systems. By implementing a decentralized and tamper-proof ledger, blockchain ensures secure and verifiable record-keeping. It is applied across sectors such as supply chain, finance, and healthcare to improve trust, speed, and accountability.

Overview of Libraries:

Library	Purpose
Nil	

EXERCISE

Improving Food Supply Chain Transparency Using Blockchain: The IBM–Walmart Case Study

Problem Statement:

The global food supply chain is complex and often lacks transparency, leading to issues such as food contamination, traceability delays, and consumer mistrust. In the event of a foodborne illness outbreak, it traditionally takes days or weeks to trace the source of contamination, which can result in health risks, financial losses, and reputational damage.

Aim of the Study:

To explore how blockchain technology can enhance transparency, traceability, and accountability in the food supply chain. Specifically, this study examines how Walmart, in partnership with IBM, implemented a blockchain-based solution to track food products from farm to shelf in near real-time.

Methodology:

Partnership and Platform:

Walmart partnered with IBM Food Trust, a blockchain-based solution built on Hyperledger Fabric.

Suppliers, distributors, and retailers were onboarded to the network.

Blockchain Implementation:

Each entity (farmer, processor, transporter, warehouse, retailer) recorded transactions (harvest date, processing, transport logs) as immutable blocks on the blockchain.

QR codes were added to packaging to scan and fetch full origin history.

Pilot Test – Mangoes and Pork:

Walmart first piloted the blockchain system on mangoes in the U.S. and pork in China.

Time to trace the mango origin was reduced from 7 days to 2.2 seconds.

Data Security and Access:

Only authorized parties could write to the blockchain.

All participants had read-only access to verify the chain of custody.

Results:

Drastic improvement in traceability speed, enabling faster response during contamination issues.

Improved consumer trust, as Walmart could prove the origin and safety of food.

Reduced waste and operational inefficiencies in recalls and audits.

Encouraged supplier compliance and accountability through transparent tracking.

Conclusion:

The Walmart–IBM blockchain case study illustrates the transformative potential of blockchain in real-world supply chains. By creating a shared, immutable ledger for all stakeholders, blockchain helped Walmart improve food safety, operational efficiency, and customer confidence. This model is now being expanded across other food categories and regions.

QUESTIONS:

1. Write a case study on block chain technology.

REFERENCE:
Website References:

1.https://www.youtube.com/watch?v=MViBvQXQ3mM
2. https://www.youtube.com/watch?v=o0hp-fRyLOc