Centurion University
Shaping Lives... Empowering Communities...

School: ..... Campus: .....

Academic Year: ..... Subject Name: ..... Subject Code: .....

Semester: ..... Program: ..... Branch: ..... Specialization: .....

Date: .....

Applied and Action Learning

(Learning by Doing and Discovery)

Name of the Experiement : Hash Your First Block – Blockchain Basics and Setup

Objective/Aim:

- To understand the basic components of a blockchain.
- To create and hash your first block using a simple Python script or conceptual framework.
- To observe how changes in data affect the hash of a block.
- To establish the foundational understanding of immutability in blockchain systems.

Apparatus/Software Used:

- Laptop/PC
- PowerPoint/Word for documentation
- Internet for research

Theory/Concept:

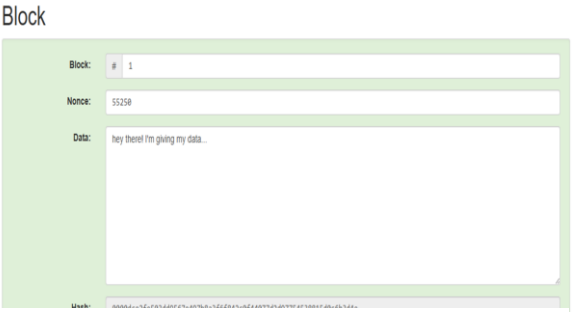
A **blockchain** is a decentralized and immutable ledger that records data in blocks. Each block contains:

- **Data**: The actual content (e.g., transactions).
- **Timestamp**: When the block was created.
- **Hash**: A unique digital fingerprint of the block.
- **Previous Hash**: The hash of the previous block to maintain the chain.

Procedure:

1. **Open the Blockchain Demo Tool**
   - Go to https://andersbrownworth.com/blockchain/block
2. **Understand the Interface**
   - You'll see fields for:
     - **Block number**
     - **Nonce**
     - **Data**
     - **Previous Hash**
     - **Hash**
3. **Enter Some Data**
   - In the **Data** field, type any message (e.g., `"Hey there! I'm giving my data"`).
4. **Click "Mine"**
   - Hit the **"Mine"** button.
   - The tool will automatically change the **Nonce** until the **Hash** starts with **four leading zeroes (0000...)**.
   - This simulates **Proof of Work (PoW)**.
5. **Observe the Output**
   - The hash updates in real-time as the tool finds the correct nonce.
   - Once mined, the hash will turn **green**, showing it's valid.
6. **Try Tampering**
   - Change the data slightly.
   - Notice the hash turns **red** (invalid) and the block is no longer mined.
   - Click **"Mine"** again to re-mine it.

*Before mining



*After mining

Observation Table

Block No.	Data	Nonce	Hash Output (SHA-256)	Hash Valid (Starts with 0000)
1	" Hey there! I'm giving my data"	10630	0000976dc363f1459a737a2831f9b3318601…	□ Yes
2	"Test Blockchain"	8362	00009f45a3bc3d6fa2d4b27a4431a3e8a0b9...	□ Yes
3	"My First Block"	298	9fc5be5c3a452b5f21d94db179e54ab08e6e...	□ No

ASSESSMENT

Rubrics	Full Mark	Marks Obtained	Remarks
Concept	10		
Planning and Execution/ Practical Simulation/ Programming	10		
Result and Interpretation	10		
Record of Applied and Action Learning	10		
Viva	10		
Total	**50**		

Signature of the Student:

Signature of the Faculty:

Name :

Regn.No.