



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 Experiment :** Hash Your First Block – Blockchain Basics and Setup

### Objective/Aim:

The objective of this exercise is to understand the basics of blockchain technology and set up a simple blockchain system.

### Apparatus/Software Used:

- Programming languages
- Blockchain platforms
- Development tools

### Theory/Concept:

A blockchain is a decentralized, distributed ledger that records transactions across a network of computers.

- **Blocks:** A block is a collection of transactions, such as data or cryptocurrency transactions.
- **Hashing:** Each block is assigned a unique code, called a hash, that connects it to the previous block, creating a chain.
- **Blockchain network:** A network of computers (nodes) that verify and validate transactions, ensuring the integrity of the blockchain.

## Procedure:

1. Choose a programming language and hashing library: Select a language (e.g., Python, JavaScript) and a hashing library (e.g., hashlib, crypto-js).
2. Define block structure: Create a block with attributes like block number, timestamp, data, and previous block hash.
3. Calculate hash: Use a cryptographic hash function (e.g., SHA-256) to calculate the block's hash based on its attributes.

### Block

Block:	# 1
Nonce:	72608
Data:	
Hash:	0000f727854b50bb95c054b39c1fe5c92e50bcfa48cb5dc279f56aa9ea365e5a
<input type="button" value="Mine"/>	

### Block

Block:	# 1
Nonce:	72608
Data:	1111
Hash:	8a1b7ffbf48bc44da1f10fbace728d7446c1ddaa03dd3a530cf7c0550e24c90
<input type="button" value="Mine"/>	

### Blockchain

Block:	# 1
Nonce:	11116
Data:	
Prev:	00
Hash:	000015783b764259d1382057891a76d200db000c3c5b35a7f8f7
<input type="button" value="Mine"/>	

Block:	# 2
Nonce:	440130
Data:	COIN
Prev:	000015783b764259d1382057891a76d200db000c3c5b35a7f8f7
Hash:	0000545483ce002117005901d7394538ecc6d74c7036724f7ed
<input type="button" value="Mine"/>	

Block:	# 3
Nonce:	12917
Data:	
Prev:	0000545483ce002117005901d7394538ecc6d74c7036724f7ed
Hash:	000042886df055d7e6ca853835220ba01
<input type="button" value="Mine"/>	

## Observation Table:

1. Each block's hash is unique and depends on its data and previous block's hash.
2. Changing a block's data will change its hash and break the blockchain.
3. The blockchain's integrity relies on the hashes linking each block together.

## 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		
<b>Total</b>	<b>50</b>		

***Signature of the Faculty:***

***Signature of the Student:***

***Name :***

***Regn.No.***

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