



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 : Proof of Work Simulator – Mining Algorithm

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

- ☐ **Initialize Block #1**
 - Set the previous hash of Block #1 to all zeroes.
- ☐ **Mine Block #1**
 - Click **Mine** to find a nonce that produces a valid hash.
 - Block turns green once valid.
- ☐ **Mine Block #2**
 - Previous hash auto-fills from Block #1.
 - Click **Mine** to find a valid nonce.
 - Block turns green on success.
- ☐ **Mine Blocks #3 and #4**
 - Each block uses the hash of the previous block.
 - Click **Mine** to validate.
 - Green indicates successful mining.
- ☐ **Check Tampering**
 - Change any block's data or nonce.
 - Affected block and all following blocks turn red.
- ☐ **Clear Blockchain**
 - Click **Clear** to reset all blocks.
 - Block #1 is auto-mined again.
- ☐ **Test Integrity**
 - Modify earlier blocks and observe chain breakage.
 - Record updated nonces, hashes, color changes, and validity.

Software used

1. Blockchain-academy
(<https://blockchain-academy.hs-mittweida.de/2021/05/proof-of-work-simulator/>)
2. MS Word.
3. Brave for researching.

* Implementation Phase: Final Output (no error)

1. First block mine.

Block Nr #1	previous hash:
Nonce:	00000000000000000000000000000000
27648	
Data:	Hash:
	00e36107172a866610e90bf67f49
MINE	

2. Mine the second block with previous hash - 00e36107172a866610e90bf67f49 and Hash- 005f28d1f2dfa0421ee5beb7dc8f

Block Nr #2	previous hash:
Nonce:	00e36107172a866610e90bf67f49
14156	
Data:	Hash:
	005f28d1f2dfa0421ee5beb7dc8f
MINE	

3. Accordingly mine the 4th block

Block Nr #4	previous hash:
Nonce:	00ba3bb80209a45a9130cd5e0f98
94186	
Data:	Hash:
	00d300982cafca595a8493de5512
MINE	

* Implementation Phase: Final Output (no error)

4. If I do some changes in any block or tamper any data in any block then this shows the chain is **no longer valid** due to tampering.

Proof of Work Simulator

Block Nr #1	previous hash:
Nonce:	00000000000000000000000000000000
15654	
Data:	Hash:
22222	003e912e8fccd82136d26b7e3a97
MINE	
Block Nr #2	previous hash:
Nonce:	00e36107172a866610e90b67f49
14155	
Data:	Hash:
	005f28d1f2dfa0421ee5beb7dc8f
MINE	
Block Nr #3	previous hash:
Nonce:	005f28d1f2dfa0421ee5beb7dc8f
51932	
Data:	Hash:
	00ba3bb80209a45a9130cd5e0f98
MINE	

5. Reset All Blocks

Click the **Clear** button.

Block #1 auto-mines again and turns green.

Block Nr #1	previous hash:
Nonce:	00000000000000000000000000000000
48711	
Data:	Hash:
	0034795cab6e74a6e0cd2e79ee6
MINE	

* Implementation Phase: Final Output (no error)

Applied and Action Learning



We can re-mine by giving different data or value from starting.

*Observations:

1. The validity of each block relies on the precise hash of its preceding block.
2. Mining involves iterating the nonce until the resulting hash satisfies the set difficulty level.
3. Modifying any block disrupts the chain by rendering that block and all subsequent ones invalid.

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. :

Page No.....

* As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.