



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: Mine It – Basic Proof-of-Work Simulation

***Coding Phase: Pseudo Code / Flow Chart / Algorithm**

- Visit <https://andersbrownworth.com/blockchain/blockchain> for mining process
- Initialize with the Block #1 ensuring that its previous hash values are all zeroes
- Now enter any data in the data field of 1st block and we will observe that its hash changes and turns into red indicating a invalid block
- Now mine the block by clicking mine button and we will observe that a new valid nonce is created and block becomes green i.e became a valid one
- Proceed to Block #2 and we will get that the hash of 1st block has been autofilled in its previous field but due to changes in data in 1st block its hash has been changed and it has become invalid and turned into red.
- Again mine the 2nd block and we will get a new corresponding valid nonce
- Repeat these steps for Block #3,#4,#5 and we will get valid blocks after mining

***Software used:**

Anders Brownworth Demo - a web-based demonstration for proof-of-work mining

*** Testing Phase: Compilation of Code (error detection)**

NO ERROR

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

* Implementation Phase: Final Output (no error)

- Initially Block #1 is valid(green) with previous hash all zeroes:
- Now any changes In the data field changes the hash and makes the block a invalid one(red)
- On mining a new valid nonce along with new hash is generated ,again made the block valid
- Now due to change in data and hash,Block #2 has become invalid
- Again on mining it , it became a valid block.
- All the blocks follow the same process

Block: # 1

Nonce: 11316

Data:

Prev: 00

Hash: 000015783b764259d382017d91a36d206d0600e2cbb3567748f

Mine

Block: # 1

Nonce: 11316

Data: Blockchain Demo

Prev: 00

Hash: 7dbd9a7b0b5cabea931670df14c9522ff7af903649a8b130f13

Mine

Block: # 1

Nonce: 70364

Data: Blockchain Demo

Prev: 00

Hash: 000047de01032aa7136ba120ff2c1dabad4ac7441b9b609462c

Mine

Block: # 2

Nonce: 35230

Data:

Prev: 000047de01032aa7136ba120ff2c1dabad4ac7441b9b609462c

Hash: 3c6c0ba869c57aee50c3526d558404344a9671fffae1bb0807f

Mine

Block: # 2

Nonce: 10738

Data: second block

Prev: 000047de01032aa7136ba120ff2c1dabad4ac7441b9b609462c

Hash: 0000269814b45c54264727c2e4b4af71785a07678fe5883e7a4

Mine

* Observation:

Chain Integrity via Hash Linking

Each block's legitimacy hinges on including the exact hash of its predecessor. This means any deviation in the previous block breaks this cryptographic link, making that block—and any that follow—invalid. It's the backbone of blockchain integrity.

Mining Through Nonce Iteration:

Mining involves repeatedly tweaking a special value called the nonce and hashing the block until the result meets the required difficulty target (often expressed as leading zeros). Only when the hash is sufficiently small does the block become valid.

Tamper Resistance and Immutable Chain:

If someone alters even a single piece of data in any block, that block's hash changes, breaking the chain. The alteration invalidates all subsequent blocks because their “previous hash” references no longer match—demonstrating blockchain's immutability.

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 :

Name :

Signature of the Faculty :

Regn. No. :

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