



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

- **Start**
Begin the mining process.
- **Get Data**
Choose a block of data (like a message or transaction list).
- **Set Target**
Choose the target difficulty (e.g., number of leading zeros in hash).
- **Set Nonce = 0**
A nonce is a number you change to get a different hash.
- **Repeat**
Combine data + nonce → make a hash.
- **Check Hash**
If hash starts with enough zeros → success!
- **If Not Match**
Increase nonce by 1, go back to step 5.
- **Found!**
Print nonce and hash. End process.

Apparatus/Software Used:

- Computer or Laptop
- Web Browser (Chrome / Firefox)
- Internet Connection
- [Proof-of-Work Simulator Website](#)

Testing Phase:

- Test 1: Change block data → Hash changes → Block turns red
- Test 2: Mine block → Valid nonce found → Block turns green
- Test 3: Change previous block → All next blocks turn red
- Test 4: Re-mine red blocks → All blocks turn green again

!

Implementation Phase: Final Output (no error)

Before mining:

- Some blocks turned red because data was changed.
- Hashes did not meet the difficulty requirement.

| | |
|-------------|----------------------------------|
| Block Nr #1 | previous hash: |
| Nonce: | 00000000000000000000000000000000 |
| 59407 | |
| Data: | Hash: |
| | 009e6353a2f8092a777d9949dc68 |
| MINE | |
| Block Nr #2 | previous hash: |
| Nonce: | |
| | |
| Data: | Hash: |
| | |
| MINE | |
| Block Nr #3 | previous hash: |

After mining:

- Clicked **Mine** on each invalid block.
- Found correct nonce for each block.
- All blocks turned **green** (valid) and the chain had no errors.

| | |
|-------------|------------------------------|
| Block Nr #2 | previous hash: |
| Nonce: | 009e6353a2f8092a777d9949dc68 |
| 39269 | |
| Data: | Hash: |
| | 001db960ef547dce26e399fe65a7 |
| MINE | |
| Block Nr #3 | previous hash: |
| Nonce: | 001db960ef547dce26e399fe65a7 |
| 97364 | |
| Data: | Hash: |
| | 00b8e9caac085a93717861721bed |
| MINE | |

Observations

- Hash changes if block data or nonce changes.
- Valid nonce makes hash meet difficulty (e.g., starts with zeros).
- Blocks are linked – changing one breaks the chain.
- Broken chain = red blocks (invalid).
- Re-mining fixes the chain and turns blocks green.

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 :

Regn. No. :

Signature of the Faculty:

Page No.....

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

