



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

Objective/Aim:

- To understand how **Proof of Work (PoW)** mining finds a valid hash using nonce.
- To see how each block in a blockchain is linked with the previous block.

Apparatus/Software Used:

- Brave
- Link : <https://blockchain-academy.hs-mittweida.de/2021/05/proof-of-work-simulator/>

Procedure:

1. Open the "Proof of Work Simulator" page. You'll see a sequence of (initially blank) blocks , with fields for *Nonce*, *Data*, *Previous Hash*, current *Hash*, and a "Mine" button for each block

Proof of Work Simulator

Published by **Mario Oettler** on 28. May 2021

Last Updated on 12. August 2024 by **Martin Schuster**

Proof of Work Simulator

| | |
|-------------|----------------------------------|
| Block Nr #1 | previous hash: |
| Nonce: | 00000000000000000000000000000000 |
| 23159 | |
| Data: | Hash: |
| | 00c4be3dcfedcc2bb67dee98d180 |

Procedure:

2. Now Click the “Mine” button on Block Nr #1. The simulator tries different nonce values to find a hash that satisfies the puzzle. When it succeeds, the block turns green.

Proof of Work Simulator

| | |
|-----------------|---------------------------------------|
| Block Nr #1 | previous hash: |
| Nonce: 77838 | 00000000000000000000000000000000 |
| Data: | Hash: 009a5e0b33c094abc0020ceed43f |

MINE

| | |
|-------------|----------------|
| Block Nr #2 | previous hash: |
| Nonce: | |
| Data: | Hash: |

3. Now you can see that the Block #2 turns red . If we click “mine” in the block #2 The simulator uses the previous block’s hash as input and repeats the process—again, a green block means success.

| | |
|-------------|----------------------------------|
| Block Nr #1 | previous hash: |
| Nonce: | 00000000000000000000000000000000 |
| 77838 | |
| Data: | Hash: |
| | 009a5e0b33c094abc0020ceed43f |

MINE

| | |
|-------------|------------------------------|
| Block Nr #2 | previous hash: |
| Nonce: | 009a5e0b33c094abc0020ceed43f |
| 91953 | |
| Data: | Hash: |
| | 00fd6e3bf9e402a4d400c0cd0b34 |

MINE

4.Repeat the above process for Mineing all the blocks.

| | |
|-------------|------------------------------|
| Block Nr #3 | previous hash: |
| Nonce: | 00fd6e3bf9e402a4d400c0cd0b34 |
| 69414 | |
| Data: | Hash: |
| | 003b966ee2d4c9390ca825522001 |

MINE

| | |
|-------------|------------------------------|
| Block Nr #4 | previous hash: |
| Nonce: | 003b966ee2d4c9390ca825522001 |
| 93979 | |
| Data: | Hash: |
| | 0003a4c6ae38431f4bfcf25d451d |

MINE

Observation :

Applied and Action Learning

- When we click **Mine**, the simulator keeps changing the **nonce** until a valid hash is found → block turns **green**.
- If we **change data/nonce** of a mined block, its hash changes → and all the following blocks turn **red** (chain broken).
- Each block depends on the **previous block's hash**, showing how blockchain ensures **security and integrity**.

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.*