Centurion University
Shaping Lives... Empowering Communities...

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 Experiement :

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

ALGORITHM:

1.Write the definition of Proof of Work (PoW).
2.Write the definition of Proof of Stake (PoS).
3.Note the working steps of PoW (mining, nonce finding, block validation).
4.Note the working steps of PoS (validator selection, block proposal, finalization).
5.Compare both mechanisms on basic points:
6.Prepare a simple comparison table of PoW vs PoS.
7.Write the conclusion about which is more energy-efficient and which is more secure.

* Softwares used

1.Brave Web Browser
2.Blockchain Explorers
3.Text Editor

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

* Implementation Phase: Final Output (no error)

Definition of PoW

PoW is a consensus mechanism where miners compete to solve a cryptographic puzzle by finding a nonce that produces a valid hash.The first miner to find the correct hash gets to add the block to the blockchain and receives a block reward.

Definition of PoS

PoS is a consensus mechanism where validators are chosen to create blocks based on the amount of cryptocurrency they have staked.Validators earn rewards for proposing and validating blocks, and they can lose part of their stake (slashing) if they act maliciously.

Working Steps of PoW

Collect transactions into a block.
Find a nonce that produces a hash meeting the difficulty target.
Broadcast the mined block to the network.
Other nodes verify the block and add it to their copy of the blockchain.

Working Steps of PoS

Select a validator based on stake amount and other factors.
Validator proposes a new block to the network.
Other validators check and vote on the block.
Once enough votes are collected, the block is finalized and added to the blockchain.

Compare PoW and PoS on Key Points

Energy Consumption: PoW is high, PoS is low.
Security: PoW requires 51% of hash power to attack, PoS requires 51% of total stake.
Speed: PoW is slower, PoS is faster.
Cost: PoW needs expensive hardware and electricity, PoS requires cryptocurrency stake.

Criteria	PoW	PoS
Energy Use	High	Low
Speed	Slower	Faster
Security	Needs 51% hash power	Needs 51% total stake
Cost	Hardware + electricity	Cryptocurrency stake
Example	Bitcoin	Ethereum (after Merge)

Here are some reliable sources you can open and research about pow and pos.
Ethereum.org – Proof-of-stake (PoS)
🔗 https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/
Ethereum.org – Proof-of-work (PoW)
🔗 https://ethereum.org/en/developers/docs/consensus-mechanisms/pow/
Investopedia – Proof of Work vs Proof of Stake
🔗 https://www.investopedia.com/terms/p/proof-work.asp
🔗 https://www.investopedia.com/terms/p/proof-stake-pos.asp

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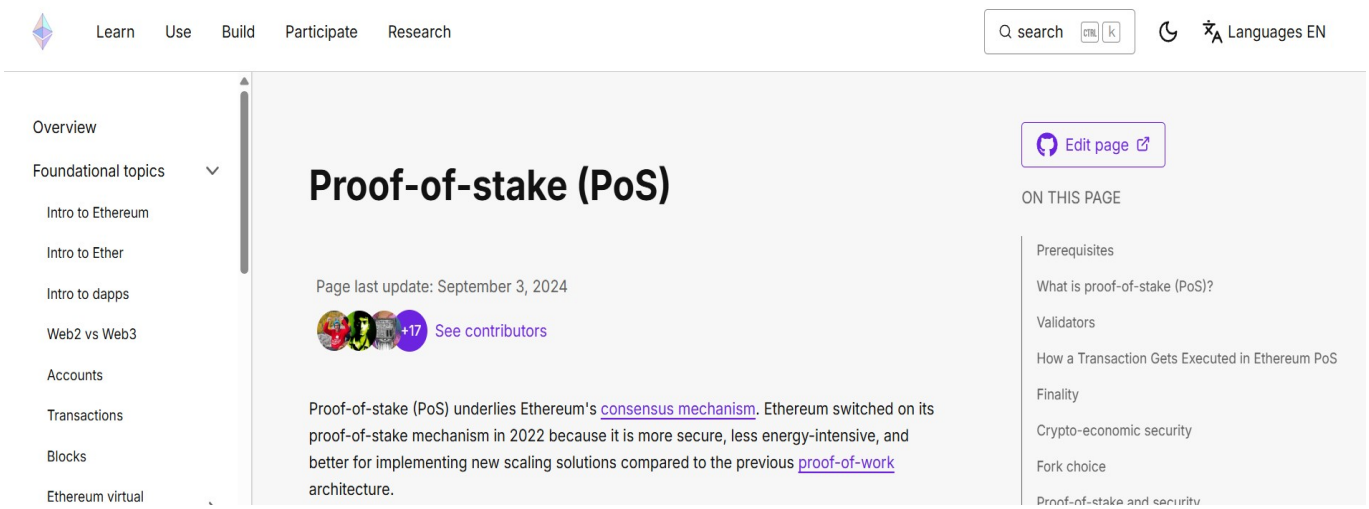
* Implementation Phase: Final Output (no error)

Applied and Action Learning



Conclusion

Summarize the main differences.
State that PoW offers strong security through computational cost, while PoS offers efficiency and lower environmental impact.

* Observations

It was observed that Proof of Work (PoW) relies on computational power and high energy consumption for block creation, making it secure but less energy-efficient. Proof of Stake (PoS) selects validators based on staked cryptocurrency, which reduces energy use and increases transaction speed. While PoW offers strong security through mining difficulty, PoS provides faster finality and better environmental impact.

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:

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