



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 : Decentralized Identity – DID and Credential Demo

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

1. User Registers a DID:

A unique Decentralized Identifier (DID) is created for the user, and stored securely on the blockchain.

2. Credential Issuance by Authority:

A trusted organization (such as a university or government) issues a verified credential, digitally signing it and associating it with the user's DID.

3. User Saves Credential:

The user stores this verified credential within a decentralized wallet or a DID-compatible application.

4. Verifier Requests Verification:

An entity (like an employer or service provider) requests the user to prove their identity or validate a credential.

5. User Provides Proof:

The user generates and shares a cryptographic proof of the credential, which is verified using blockchain-based public keys.

6. Verifier Confirms Authenticity:

The verifier checks the DID record from the blockchain to ensure the credential is genuine, valid, and has not been altered.

* **Software used**

1. Remix IDE

2. Metamask Wallet

3. Ethereum testnet(Sepolia)

4. JSON Web Tokens

* Testing Phase: Compilation of Code (error detection)

- 1.Generated a unique DID on the test network (e.g., did:ethr:0xabc123...).
- 2.The issuer digitally signed and issued a verifiable credential (like a “Course Completion Certificate”).
- 3.The user securely stored the credential in a DID wallet for later use.
- 4.A verifier requested credential validation through a proof request.
- 5.The user shared the verifiable proof, which was validated using blockchain-stored DID data.
- 6.The verifier confirmed that the credential was authentic, unaltered, and issued by a trusted source.

* Implementation Phase: Final Output (no error)

Applied and Action Learning

- 1.The DID for the user was successfully created and stored on the Ethereum Sepolia Test Network using the DID registry.
- 2.The issuer digitally issued and signed a verifiable credential (e.g., identity or certificate) linked to the user's DID.
- 3.The user stored the credential securely in a local DID wallet, ensuring privacy and ownership of personal data.
- 4.The verifier initiated a request for credential verification through a DID-based proof request.
- 5.The user generated and shared a verifiable cryptographic proof with the verifier.
- 6.The verifier validated the credential using blockchain metadata and confirmed its authenticity and integrity.
- 7.The entire process ensured trustless identity verification, proving that decentralized identity systems eliminate the need for centralized intermediaries.

* Observations

- 1.The DID system successfully demonstrated decentralized identity verification without centralized authorities.
- 2.The credential verification process was secure, transparent, and resistant to tampering or forgery.

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. :

Page No.....

Signature of the Faculty:

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