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 : Solidity Patterns – Advanced Inheritance

Objective/Aim:

- To understand advanced inheritance features in Solidity.
- To explore method overriding, multiple inheritance, and the use of super.
- To analyze how Solidity resolves inheritance conflicts using C3 linearization.

Apparatus/Software Used:

- **Programming Language**: Solidity
- **IDE/Compiler**: Remix IDE / Hardhat / Foundry
- **Client**: Local Ethereum testnet (Ganache, Hardhat, or Geth)
- **Wallet**: MetaMask .

Theory concept:

- Inheritance in Solidity allows contracts to reuse code from parent contracts.
- **Types of Inheritance:**

  Single inheritance: One contract inherits from one parent.

  Multiple inheritance: One contract inherits from multiple parents.

- **Function Overriding:** Child contracts can override parent functions using the override keyword.
- **Virtual Functions:** Marked with virtual, allowing them to be overridden in child contracts.
- **Super Keyword:** Calls the immediate parent function in the inheritance hierarchy.
- **C3 Linearization:** Solidity resolves multiple inheritance using a linearized order to avoid ambiguity.

Procedure:

1. Open Remix IDE or Hardhat environment.
2. Create contracts demonstrating multiple inheritance.
3. Mark parent functions as virtual.
4. Override them in child contracts using override.
5. Deploy the final contract to testnet or local environment.
6. Call functions to observe which parent implementation executes.

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Observation:

The contracts were compiled and deployed successfully. On calling foo() from contract D, Solidity followed the linearized inheritance order, showing how multiple inheritance and super work together to resolve function execution paths.

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. :

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