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 and implement advanced inheritance patterns in Solidity, including the concepts of multiple inheritance, function overriding, virtual functions, and method resolution order (C3 linearization) using Remix IDE.

Apparatus/Software Used:

- Remix IDE
- MetaMask (optional for live deployment)
- JavaScript VM (EVM Simulation)

Theory concept:

Inheritance in Solidity allows one contract to derive properties and behavior from another contract.

It promotes code reuse, organization, and modularity — a key feature in object-oriented programming (OOP).

Advanced Inheritance involves:

- Multiple Inheritance: A contract can inherit from more than one parent contract.
- Method Overriding: Child contracts can override parent contract functions using the override keyword.
- Virtual Functions: Parent functions marked as virtual can be overridden by child contracts.
- Super Keyword: Used to call the parent's version of an overridden function.
- Solidity uses the C3 Linearization (Method Resolution Order) to determine which parent function
- executes first when multiple inheritance paths exist.

Procedure:

- Open Remix IDE and create a new file AdvancedInheritance.sol.
- Set the Solidity compiler version to 0.8.0 or above.
- Write the following smart contract code to demonstrate advanced inheritance.
- Compile the contract and fix any syntax errors if present.
- Deploy the main contract using the JavaScript VM environment.
- Call inherited and overridden functions to observe behavior.
- Record outputs and function call sequence.

Observation:

- Solidity supports multiple inheritance similar to Python.
- The order of parent contracts in the child contract determines method resolution.
- Functions in parent contracts must be marked virtual to be overridden.
- The override(A,B) syntax ensures clarity when multiple parents define the same function.
- The super keyword executes the next function in the linearization hierarchy.

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.