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 : Layer 2 Bridge – Explore Optimism/zkSync

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

Algorithm

1. Initialize Environment • Set up Ethereum testnet and Layer 2 networks (Optimism / zkSync). • Configure MetaMask or Hardhat with both networks.
2. Deploy Smart Contract on L1 • Write and deploy a simple ERC-20 or message-passing contract on Ethereum testnet.
3. Bridge Configuration • Connect the bridge interface (official Optimism / zkSync bridge). • Approve tokens or assets for transfer.
4. Asset Transfer • Initiate deposit from L1 → L2 using bridge contract functions. • Wait for transaction confirmation and verify on L2.
5. Withdrawal Process • Perform withdrawal from L2 → L1. • Wait for challenge/finalization period (for Optimism) or validity proof (for zkSync).
6. Verification & Output • Confirm successful bridging and transaction completion. • Display final token balances and gas savings.
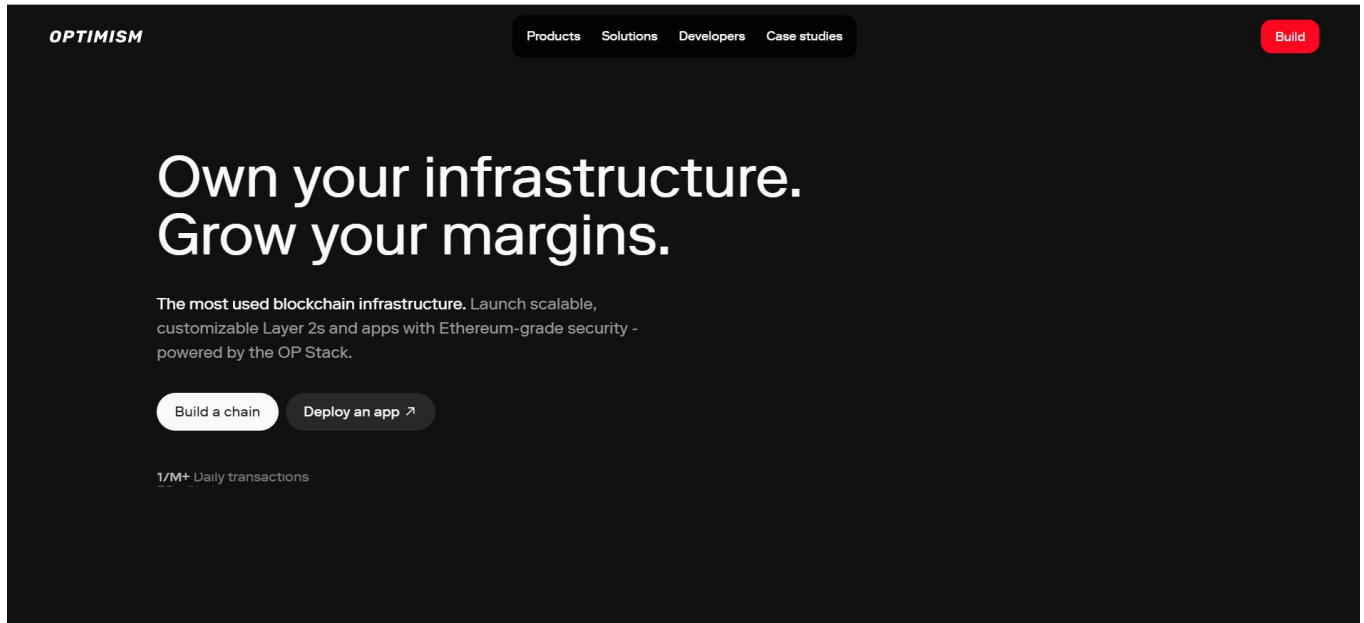
* Softwares used
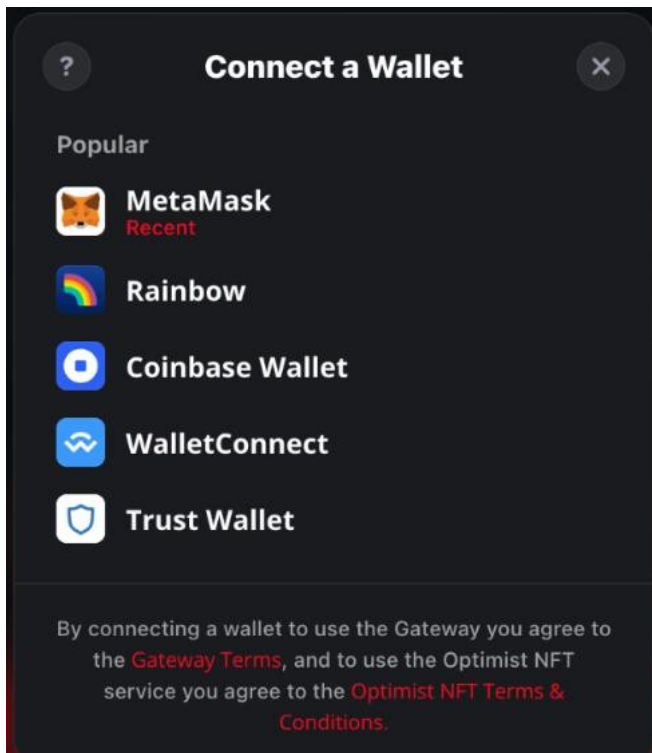
1. MetaMask
2. Hardhat
3. VS code

* Implementation Phase: Final Output (no error)
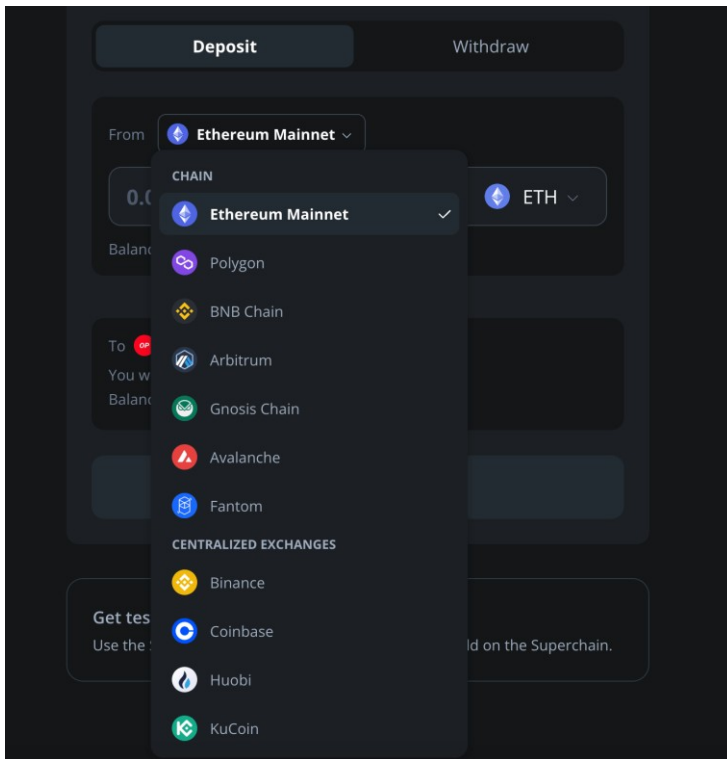
How To Bridge to Optimism Using Optimism Bridge

 Step 1: Open the Optimism Bridge App

Step 2: Connect Your Wallet

*Implementation Phase: Final Output (no error)

Step 3: Select the Network

* Observations

1.Seamless connectivity - The bridge successfully facilitated smooth asset transfers between Ethereum Layer 1 and Layer 2 solutions (Optimism and zkSync)
2.Performance improvements - Layer 2 transactions demonstrated better speed and lower costs compared to Ethereum mainnet
3.Security and reliability - The cross-chain transfers maintained security standards while ensuring reliable and synchronized operations

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............