SafeShipping

## 🔐 Smart Contract Design & Security

1. **Design Patterns for Secure Smart Contracts in Supply Chains**
   * Reentrancy, access control, upgradability, circuit breakers.
2. **Mitigating Oracle Manipulation in Shipping Events**
   * Use of decentralized oracles (e.g., Chainlink) for tracking shipment status.
3. **Formal Verification of Shipping-Related Smart Contracts**
   * Using tools like MythX, Slither, or Certora to mathematically prove correctness.

## 🚢 Shipping Logic & Logistics Integration

1. **Tokenized Bills of Lading via Smart Contracts**
   * Creating NFTs to represent ownership of shipped goods.
2. **Multi-Party Agreement Enforcement in Maritime Contracts**
   * Smart contracts mediating carriers, port authorities, insurers, and recipients.
3. **IoT + Blockchain: Verifying Shipment Integrity**
   * Smart contracts triggered by IoT data (temperature, seal integrity, GPS).

## ⚖️ Legal, Compliance & Auditing

1. **Smart Contracts as Legal Instruments in International Trade**
   * Bridging the gap between code law and jurisdictional law.
2. **GDPR and Supply Chain Transparency: A Blockchain Trade-off**
   * Balancing immutability with data privacy for European shipments.
3. **Auditable Shipping Records Using Blockchain**
   * Building tamper-proof, cryptographically verifiable audit trails.

## 💰 Tokenomics, Incentives & Payments

1. **Token-Based Incentives for Timely and Accurate Delivery**
   * Using staking or slashing to align logistics provider incentives.
2. **Cross-Border Stablecoin Payments for Shipping**
   * Instant, auditable payments for carriers and customs clearance.

## 📦 UX & Adoption

1. **Usability Challenges in Blockchain-Based Shipping Applications**
   * Designing user interfaces for non-crypto-native logistics stakeholders.
2. **Interfacing Legacy Logistics Software with Web3 Infrastructure**
   * Middleware to integrate SAP/Oracle SCM with EVM chains.

## 🌐 Interoperability & Architecture

1. **Cross-Chain Shipment Tracking: LayerZero, Polkadot, or Cosmos?**
   * Compare methods for multi-chain tracking of global shipments.
2. **Blockchain Network Selection for SafeShipping Apps**
   * Evaluating EVM chains (Polygon, Arbitrum), non-EVM (Solana, NEAR) for cost, speed, decentralization