

# Risk Scoring Report - Compound Protocol

## 1. Data Collection Method

Since live on-chain data was not accessible in this assignment, we generated a simulated dataset that mimics real user behavior on the Compound V2/V3 lending protocol. The dataset included:

- Ethereum wallet addresses
- Simulated values for supplied/borrowed USD amounts, repayments, liquidation history, activity, and recency

## 2. Feature Selection Rationale

We selected features that reflect key financial behaviors in the Compound protocol:

- Total Supplied USD
- Total Borrowed USD
- Total Repaid USD
- Liquidation Count
- Activity Count
- Days Since Last Transaction

From these, we derived normalized indicators like `borrow_to_supply_ratio`, `repayment_ratio`, and `utilization_rate`.

## 3. Scoring Method

We computed a risk score from 0 to 1000 using this weighted formula:

$$\begin{aligned} \text{risk\_score} = & 1000 * ( \\ & 0.25 * \text{borrow\_to\_supply\_ratio} + \\ & 0.25 * \text{utilization\_rate} + \\ & 0.20 * (1 - \text{repayment\_ratio}) + \\ & 0.15 * \text{liquidation\_flag} + \\ & 0.15 * \text{inactivity\_flag} \end{aligned}$$

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The higher the score, the higher the wallet's financial risk.

### 4. Justification of Risk Indicators

- Borrow-to-supply ratio: Indicates leverage; high = risky
- Utilization rate: Measures how close the wallet is to liquidation
- Repayment ratio: Low value suggests unreliable borrower
- Liquidation history: Past liquidations are a strong risk signal
- Inactivity: Inactive wallets may not manage risk in real-time