Product Requirements Document (PRD): Decentralized Yield Optimizer (Updated Workflow)

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1. User Flow: Step-by-Step

Step 1: User Selects Pools

1. **User Action**:
    - User selects **one or more pools** to invest in.
    - Pools are categorized by **risk level**:
        - **Low Risk**: 1 pool (e.g., stablecoin lending pool).
        - **Medium Risk**: 2 pools (e.g., mixed lending/liquidity pools).
        - **High Risk**: 3 pools (e.g., high-volatility liquidity pools).
    - User can allocate funds **flexibly** across pools (e.g., 70% in Low Risk, 30% in High Risk).
    - User can **add more pools later** (e.g., initially invest in Low Risk, then add Medium Risk later).

Step 2: User Deposits Funds

1. **User Action**:
    - User deposits funds into the selected pools.
    - Funds are allocated **weight-wise** based on the **risk model's recommendations**.
2. **System Action**:
    - Funds are split and deposited into the selected pools according to the risk model's weightage.
    - Example:
        - **Low Risk**: 100% of funds go to Pool A.
        - **Medium Risk**: 60% to Pool B, 40% to Pool C.
        - **High Risk**: 50% to Pool D, 30% to Pool E, 20% to Pool F.

Step 3: User Withdraws Funds

1. **User Action**:
   - User selects **withdrawal amount** (partial or full).

   - User selects **which pool(s)** to withdraw from.

2. **System Action**:
   - **Partial Withdrawal**:
     - System withdraws the specified amount from the selected pool(s).

     - Example:
       - User withdraws $1,000 from Pool B (Medium Risk).

   - **Full Withdrawal**:
     - System withdraws the entire balance from the selected pool(s).

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2. Rebalancing: Why and How

2.1 Why Rebalancing?

- **Objective**: Maximize returns and minimize risk by dynamically adjusting fund allocations based on market conditions.

- **Trigger**: Rebalancing occurs **every 6 hours** based on recommendations from **System A (AI Risk Model)**.

- **Reason**: Market conditions (volatility, liquidity, etc.) change over time, and rebalancing ensures funds are always allocated optimally.

2.2 How Rebalancing Works

1. **System A (AI Risk Model)**:
   - Analyzes market data (volatility, liquidity, protocol reliability).

   - Computes **new weight percentages** for each pool.

   - Example:
     - Initial weights: Pool B (60%), Pool C (40%).

     - Updated weights: Pool B (50%), Pool C (50%).

2. **System B (Transaction System)**:

- Compares current allocations with new weights.

- Calculates the **delta (difference)** between current and target allocations.

- Executes swaps/transfers to rebalance funds:
  - Funds are moved **from pools with decreased weights** to those with **increased weights**.

  - Example:
    - Move 10% of funds from Pool B to Pool C.

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3. Example Workflow

3.1 Deposit

1. User selects **Low Risk** and deposits $5,000.
   - System allocates funds:
     - Pool A: $5,000

2. Later, user adds **Medium Risk** and deposits $3,000.
   - System allocates funds based on risk model weights:
     - Pool B: $1,800 (60%)

     - Pool C: $1,200 (40%)

3.2 Rebalancing

1. After 6 hours, System A updates weights for Medium Risk:
   - Pool B: 50%

   - Pool C: 50%

2. System B calculates deltas:
   - Pool B: Decrease by 10% ($180)

   - Pool C: Increase by 10% ($180)

3. System B executes transfers:
   - Moves $180 from Pool B to Pool C.

3.3 Withdrawal

1. User withdraws $1,000 from **Medium Risk** profile.

2. System withdraws proportionally:
   - Pool B: $500

   - Pool C: $500

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4. Key Points for Developers

1. **User Flexibility**:
   - Users can select multiple pools and allocate funds flexibly.

   - Users can add more pools later.

2. **Rebalancing Logic**:
   - Ensure atomicity (all-or-nothing) for rebalancing transactions.

   - Handle swaps/transfers efficiently to minimize gas fees.

3. **System Integration**:
   - System B must seamlessly interact with System A for weight updates.

   - Ensure robust error handling for blockchain transactions (e.g., Solana downtime).