1 System Overview

TODO: Provide overview of the system and what it does..mention Perpetuals and Lendjng Market.

2 Agent Actions

2.1 Perpetuals Market

NOTE: formatting? bold actions?
Agents can:

- create some *quantity* of a tokenized short A-PERP position at a specific price, where A is an approved asset. To do so, the Agent must provide sufficient *margin* in some asset. Quantity is decided by the system, based on specified price and margin.
- offer tokenized short A-PERP position for sale
- buy offered tokenized A-PERP position, taking coubterparty long position
- liquidate a tokenized A-PERP position thst meets perpetual liquidation conditions

2.2 Lending Market

Agents can:

- borrow: initiate a loan to obtain some quantity of a value asset, after providing some quantity of an approved collateral asset
- repay some or all of an existing loan
- liquidate an existing loan that meets a loan liquidation threshold

3 System Decisions

System Decisions occur in response to Agent Actions.

3.1 Perpetuals Market

- Based on an Agent's provided margin and specified price, the System must calculate the maximum amount of A-PERP tokend that the Agent is allowed to create.
- Based on size of an Agent's margin and position, as well as current price information, the System must deciede whether to liquidate all or part of the position.

3.2 Lending Market

- Based on Agent's provided collateral and its own current price information, the System must determine the largest amount of a value asset that it will lend the Agent.
- Based on the size of a loan and its backing collateral, the system must decide whether or not to liquidate that particular loan.

4 Decision Rules

This section gives more granular description and implementation details of the System Decisions. For ease of reading, we use a typed pseudocode for the description.

4.1 System Parameters

Lending Market: Maintenance Margin Rate

Maintenance margin specifies the minimum equity the **SHORT** account must hold, expressed as a fixed fraction of the current price multiplied by `TokenAmount`.

Let $r^A_{\text{mm}} \in (0, 1)$ denote the maintenance margin rate for an asset A.

This requirement reflects how much loss the account must be able to absorb before liquidation is triggered.

Perpetuals Market: Loan-to-Value Rate

For a collateral asset C and a value asset V, the Loan-to-Value ratio $\lambda_{C \to V}$ specifiesthe maximum amount of V for a given quantity of C.

4.2 System Functions

TODO: pythonic code

5 System Events and Infrastructure

System Events occur on a regular cadence.

- Update asset prices, using available information from both internal and external markets.
- For all loans, make liquidation decisions.
- For all perpetual positions, make liquidation decisions.

6 System Security Properties

6.1 Margin and Value Assets Should Have Strong Demand

6.2 Price Information Must Be Accurate

6.3 The Perpetuals Market Must Remain Solvent

6.4 The Lending Market Must Avoid Bad Debt