



O\$P\$

TEAM 13

The Game of Loans

How to use money to make
money

Start



O\$P\$

TEAM 13

Engineering Systems Architecture x
Manufacturing Service Operations
2023 Term 5

The Game of Loans

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Start

Welcome to O\$P\$ Bank

We are excited for you to join our family, as part of your onboarding process, we would like to invite you to first play a game to better understand the operations of our bank





**How to play our
game?**

The player is the bank



Game Inputs



Monthly Deposits



Monthly Withdrawals

These follows a gamma distribution with seasonal conditions for certain months

Player Inputs



Loans approval



Loans sale

The player would weigh trade offs between potential returns and risks

Game Outputs



**Total cash balance
(Used in leaderboard)**

Total deposits + Loan revenue - Loan cost - Liquidation loss - Total withdrawals

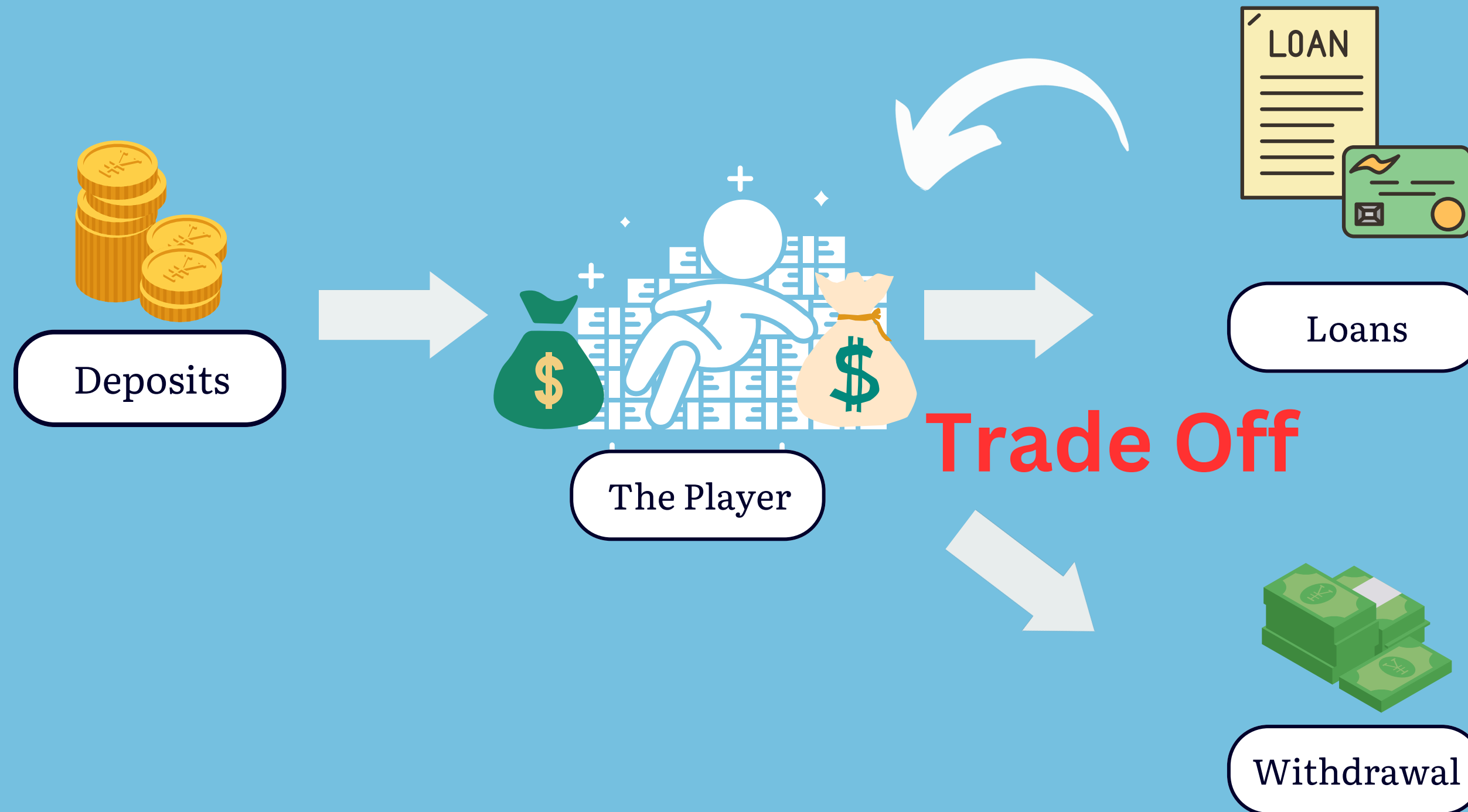
The video

MSO mission statement

Our mission is to teach a banking trainee skills in the industry in a low-risk manner with a fun and interactive game.

Our group aims to teach the concepts of risk management and maximising the utility of idle capital.

Optimal order quantity

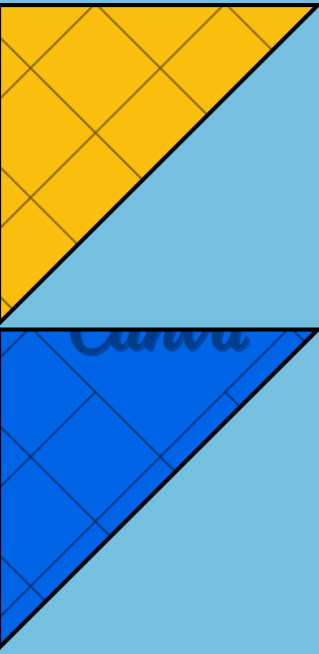


Overage and Underage

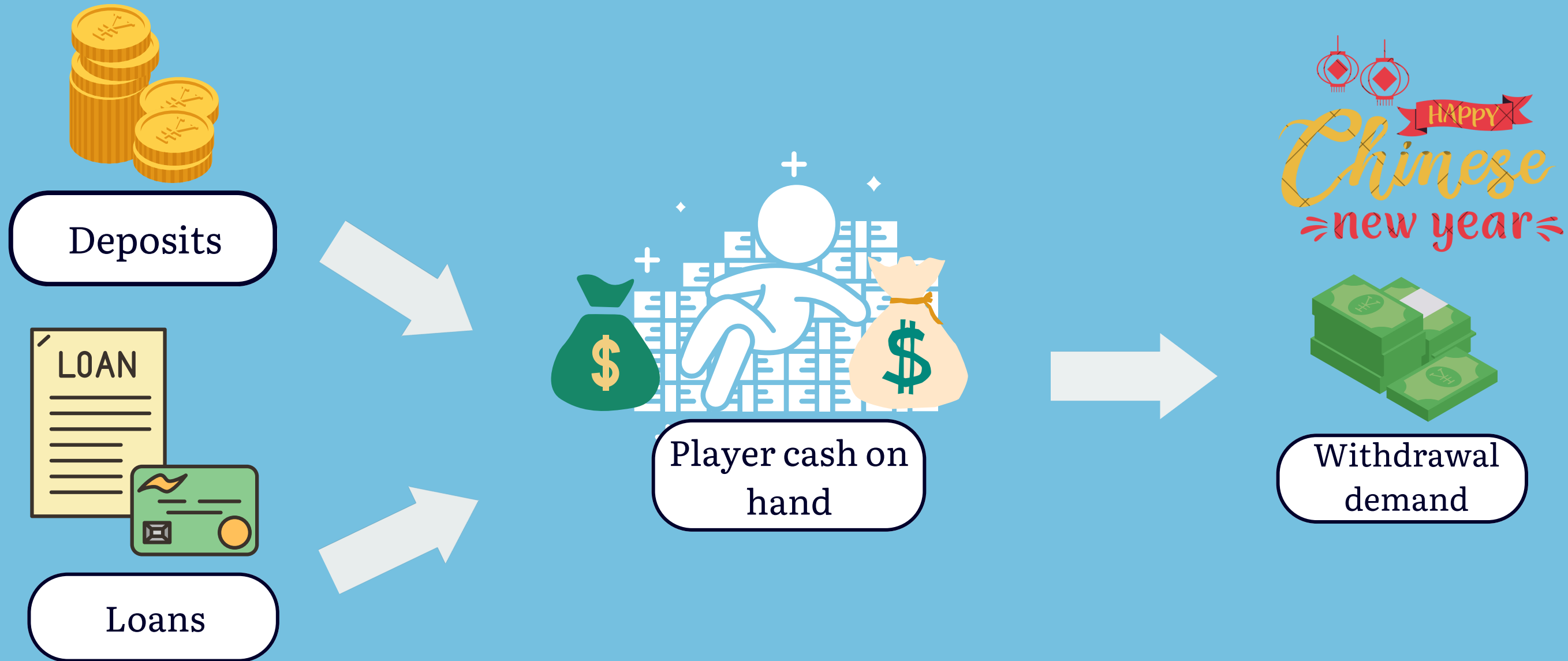
Overage: Holding cash instead of loaning it out and earning interest

Underage: Not holding enough cash to meet withdrawal demand





Safety stock and Seasonal demand anticipation



Risk Management



High Risk



Lower Risk

VS

Trade Off



More Potential
Cash



Less Potential
Cash

Initial prototype

Retail Bank Simulator

No Bank Runs!

- Home
- Tutorial
- Game**
- Leaderboard

Game of Loans

Next Month

Current Stats

Current Month: 1	Title
170.77	Placeholder
TOTAL CASH	PLACEHOLDER
Placeholder ▾	Placeholder ▾
Placeholder	Placeholder
PLACEHOLDER	PLACEHOLDER

Deposits and Withdrawals

Welcome to the dashboard!

Loan Purchasing

Select No. of each type of loan!

Loan 1 | Cost: \$200 | Interest Rate: 1% | Default Rate: 50%

0

Cash Balance

Next version (sprites and colours added)

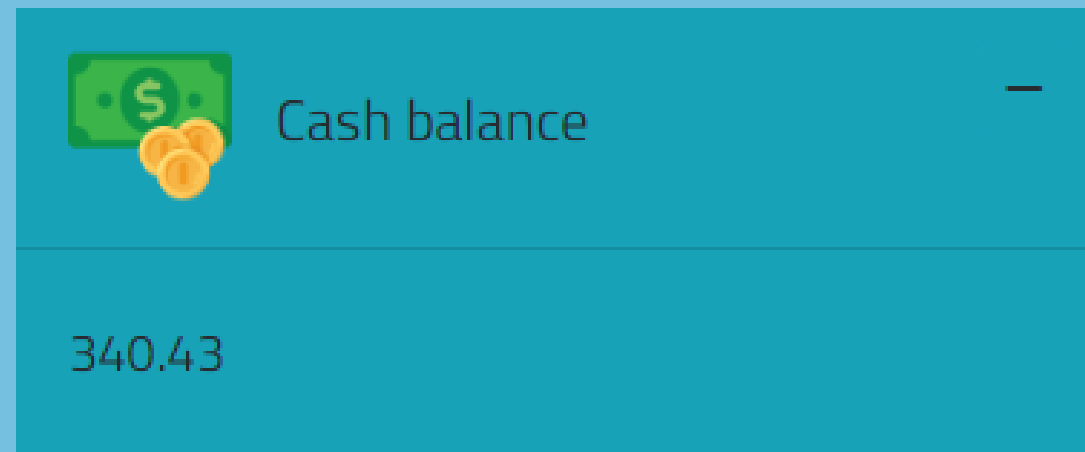
The screenshot displays the 'Retail Bank Simulator' interface. On the left is a dark sidebar with a green header containing a bank icon and the text 'Retail Bank Simulator'. Below the header, the text 'No Bank Runs!' is visible. The sidebar contains a menu with icons and labels for 'Home', 'Tutorial', 'Game' (which is highlighted), and 'Leaderboard'. The main content area has a green background and a pink header that says 'Current Month: 1'. A blue button labeled 'Next Month' is positioned to the right of the header. The main area contains several white panels with icons and text: 1. 'Total Cash' panel with a blue icon, a green banknote icon, and the value '225.74'. 2. 'State of each inventory' panel with a clipboard icon and the text 'No loans in inventory currently, purchase some from the loans purchasing panel!'. 3. 'Graphs' panel with a bar chart icon and the text 'No graphs to plot yet'. 4. 'Loan Purchasing' panel with a 'LOAN' icon, a pencil icon, and the text 'Select No. of each type of loan!'. It lists 'Loan 1 | Cost: \$200 | Interest Rate: 1% | Default Rate: 50%' and has an input field containing '0'. Below it, 'Loan 2 | Cost: \$300 | Interest Rate: 5%' is partially visible. 5. 'Completed Loans' panel with a '100%' icon and the text 'No loans that reached maturity yet!', 'No loans that were defaulted on yet!', and 'No loans that were liquidated yet!'.

Final version (More user-intuitive layouts)

The screenshot displays the 'Game of Loans' web application interface. The top navigation bar includes a home icon, the title 'Game of Loans', and utility icons for help, search, and settings. The main content area is divided into several sections:

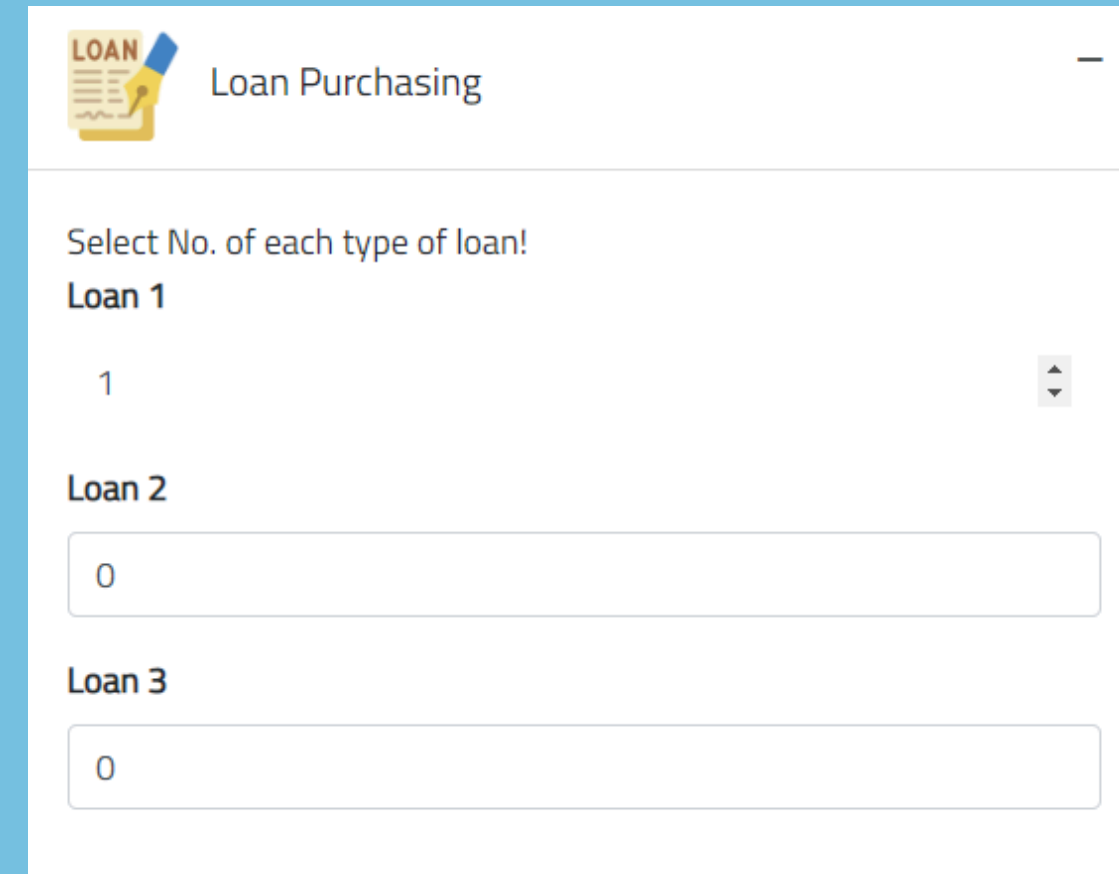
- Current Month: 4/36**: A header indicating the current month in the game.
- Cash balance**: A teal box showing a balance of 444.03.
- Loans Information**: A teal box listing three loan types: Loan 1 (Cost: \$200, Interest Rate: 2%, Default Rate: 2%), Loan 2 (Cost: \$300, Interest Rate: 3%, Default Rate: 3%), and Loan 3 (Cost: \$600, Interest Rate: 6%, Default Rate: 6%). A note states: "Interest and default rates are expressed as effective monthly rates".
- Loan Purchasing**: A white box with the heading "Select No. of each type of loan!". It contains three input fields for Loan 1, Loan 2, and Loan 3, each with the value 0.
- State of each inventory**: A white box showing a progress bar for "Loan 955 | Loan value - \$ 200 | Duration to maturity - 1 month | progress - 50.00%".
- Next Month**: A light blue box at the top right of the main content area.
- Completed Loans**: A white box with a green circular icon containing '100%' and the text: "No loans that reached maturity yet!
No loans that were defaulted on yet!
No loans that were liquidated yet!".
- Graphs**: A white box at the bottom left of the main content area with a bar chart icon.

Feature 1: Loan approval



Cash balance

340.43



Loan Purchasing

Select No. of each type of loan!

Loan 1

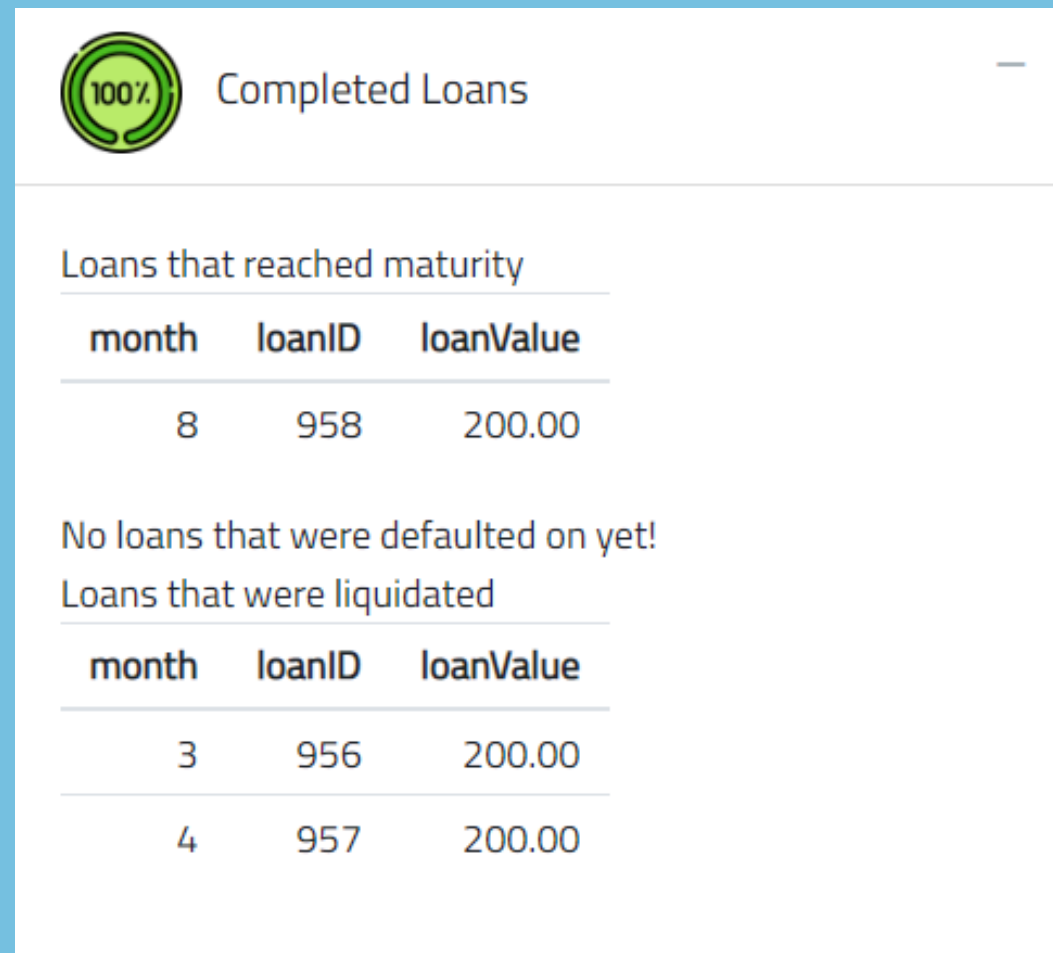
1

Loan 2

0

Loan 3

0



100% Completed Loans

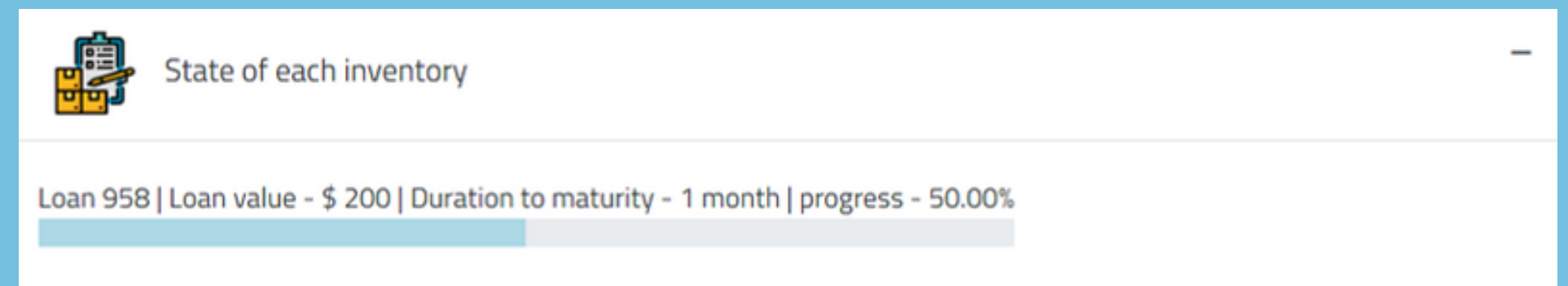
Loans that reached maturity

month	loanID	loanValue
8	958	200.00

No loans that were defaulted on yet!

Loans that were liquidated

month	loanID	loanValue
3	956	200.00
4	957	200.00

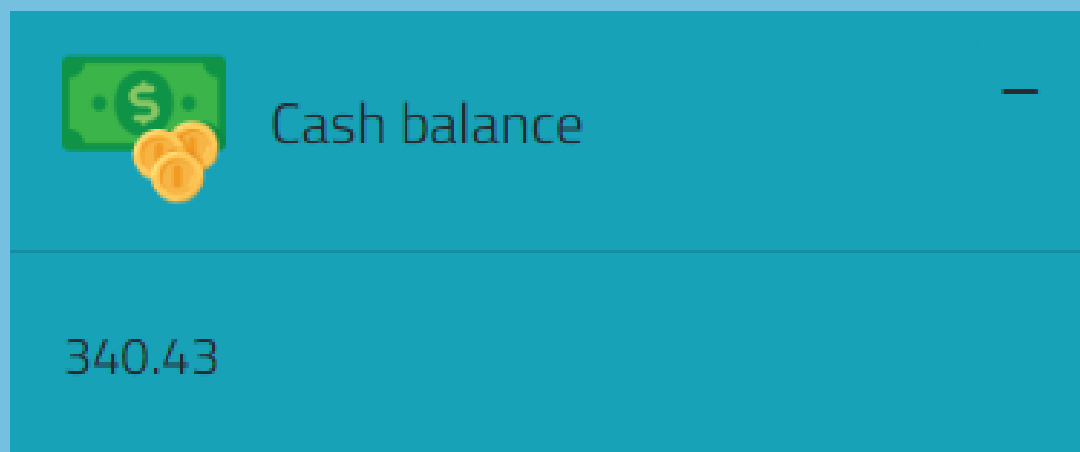


State of each inventory

Loan 958 | Loan value - \$ 200 | Duration to maturity - 1 month | progress - 50.00%


Progress bar: 50% complete

Feature 2: Loan liquidation



Cash balance —

340.43



Select loans to liquidate.

Cash balance: 29.09
Amount still needed to satisfy withdrawals: 94.75
Note that only 70% of the value of liquidated loans will be added to your cash balance.

Number of \$200 loans you still have: 1
Number of \$300 loans you still have: 0
Number of \$600 loans you still have: 0

Select number of \$200 Loans to liquidate

Select number of \$300 Loans to liquidate

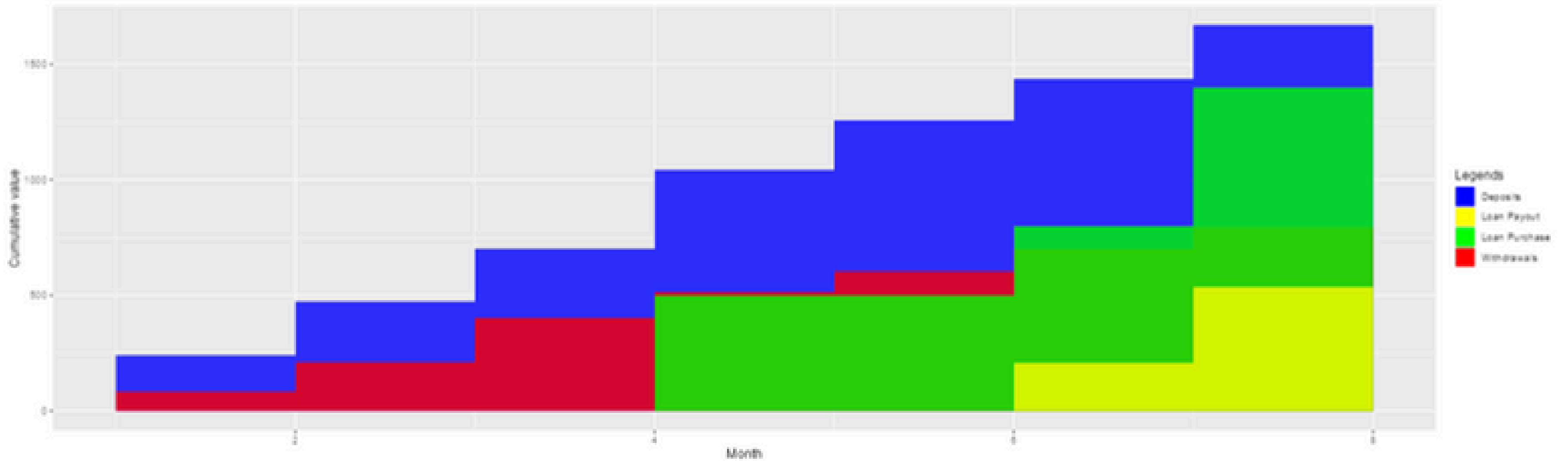
Select number of \$600 Loans to liquidate

Confirm loans to liquidate

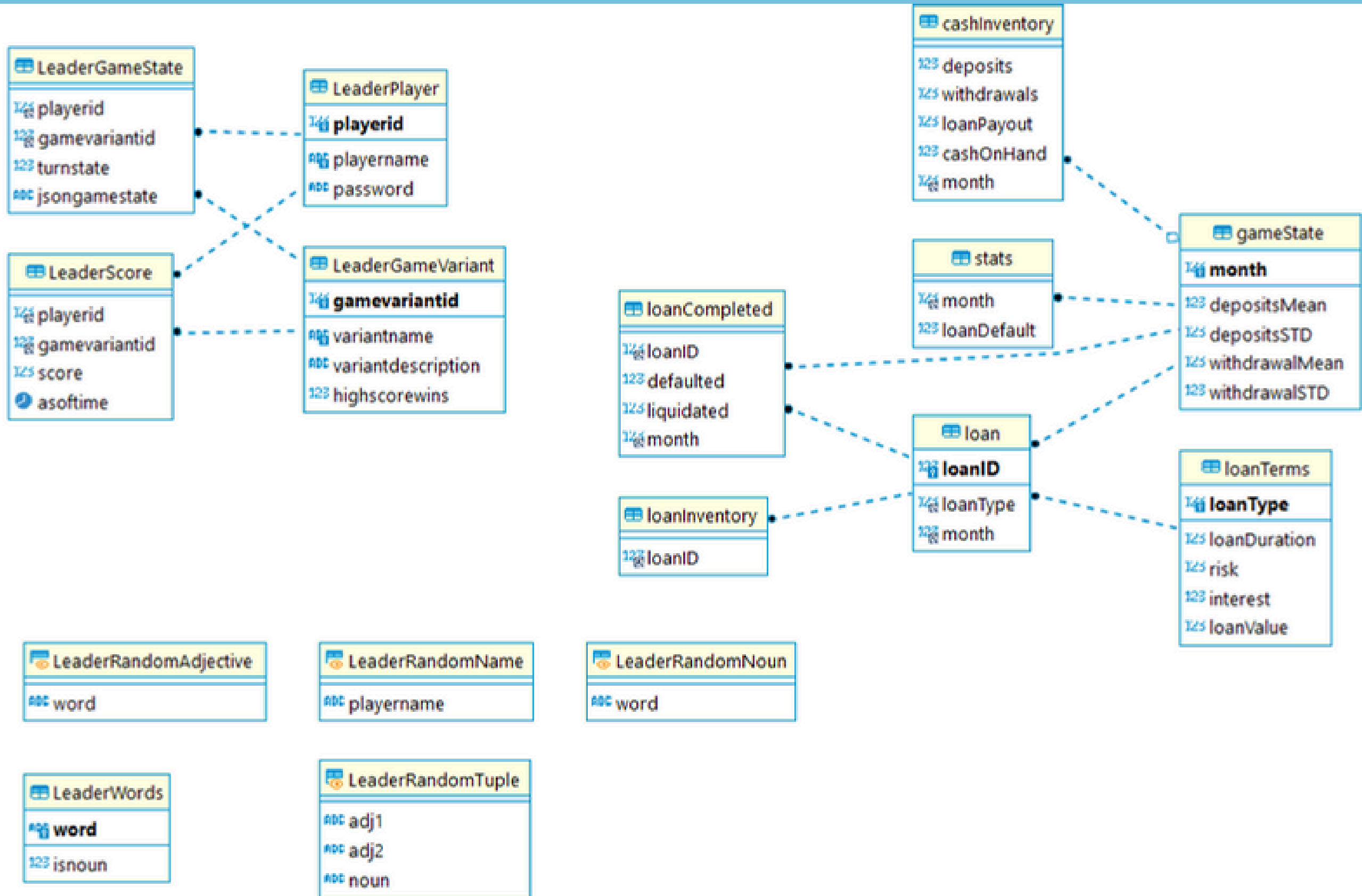
Feature 3: Graphs



Graphs



Database design



Possible game improvements



Real time based game



Queueing system for deposit counters



Random loan demand



Challenges faced



Collaborating on Github



Debugging



Game balancing





Thank You!

Team ODPD