# MIE 1622
# Group Course Project
## Short-term Investment Planner Chatbot

Group 9

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# Outline

## 01
### Business Overview

## 02
### Chatbot Assistant

## 03
### Decision Maker "Orion"

## 04
### Results

# 01

# Business Overview

# Introduction of Short-term Investment Planner Chatbot

## Functions

· Automatic short-term investment plans based on user needs

· Simulate future money-on-hand at the end of holding period

## Objectives

· The automated investment advising interface can be easily accessed

· Forecasting results can be easily viewed and compared

· Consider flexibility on asset inclusion (users with or with prior investment knowledge)

## Constraints

· All inputs must be entered in the similar format as required by the robot

**02**

**Chatbot Assistant System**
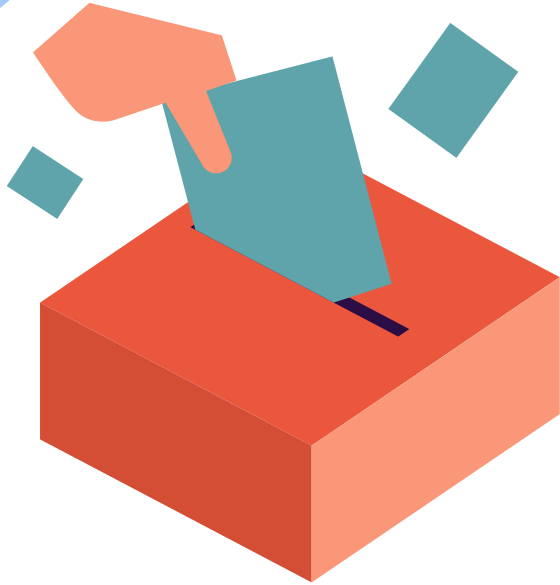
# Chatbot Assistant System

Robo-advisor provides investing suggestions for short-term investing (the holding period is fewer than 100 days).

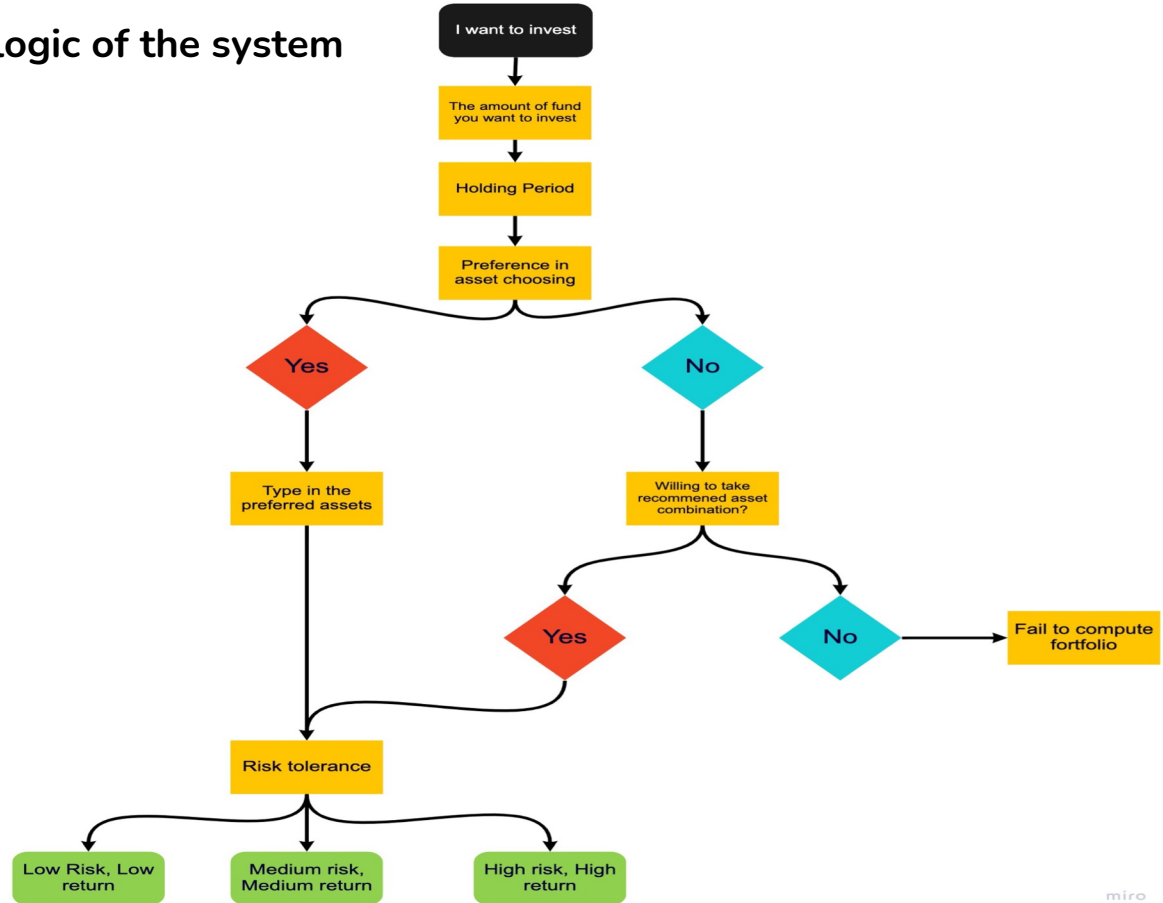Robo-advisors can automatically guide potential customers to tell the chatbot:
- Amount to invest
- Holding period
- Assets they want to invest
- Risk tolerance level

Unique features:
- Allows own preferences
- Otherwise, a fixed choice of ETFs chosen by our system
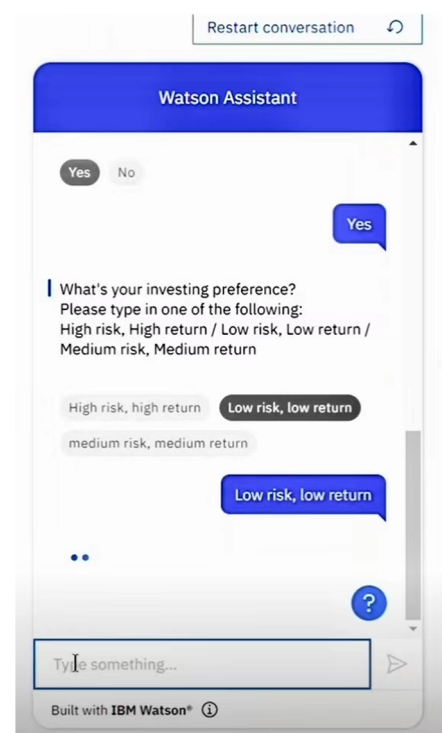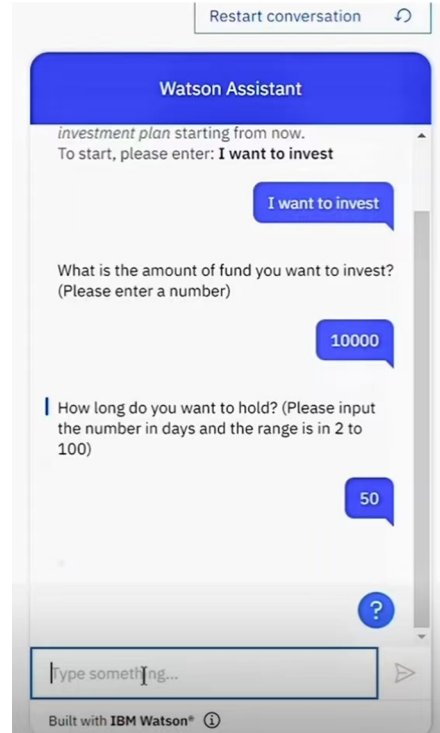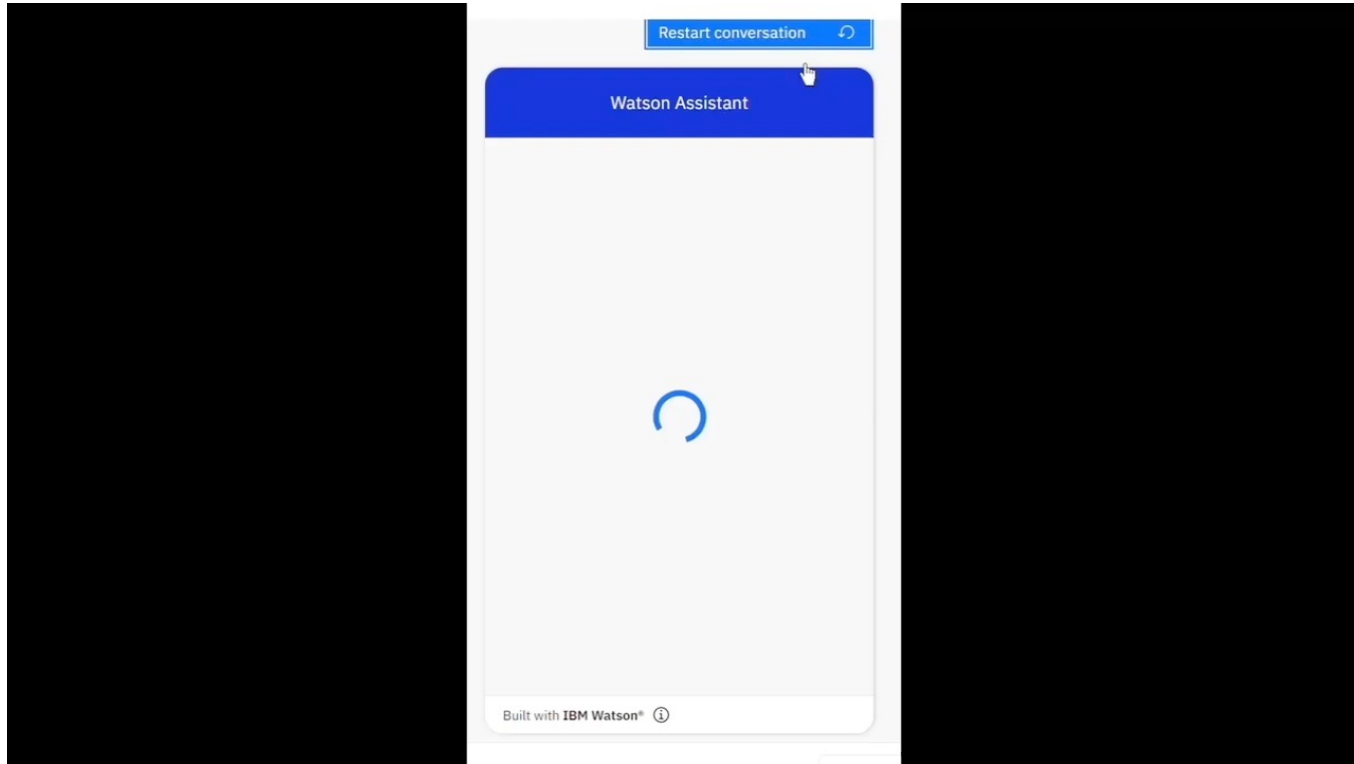
# Chatbot by following the logic of the system



**The video demo for chatbot**

# Chatbot by following the logic of the system

# 03

## Decision Maker Orion

# How Decision Maker Orion Works

**03**

**Visualize Return Simulations**

**Load Chatbot Assistant User Preferences into the Decision Maker Orion.**

**01**

**02**

**Decision Maker Orion Calculates the Best Investment Plan**
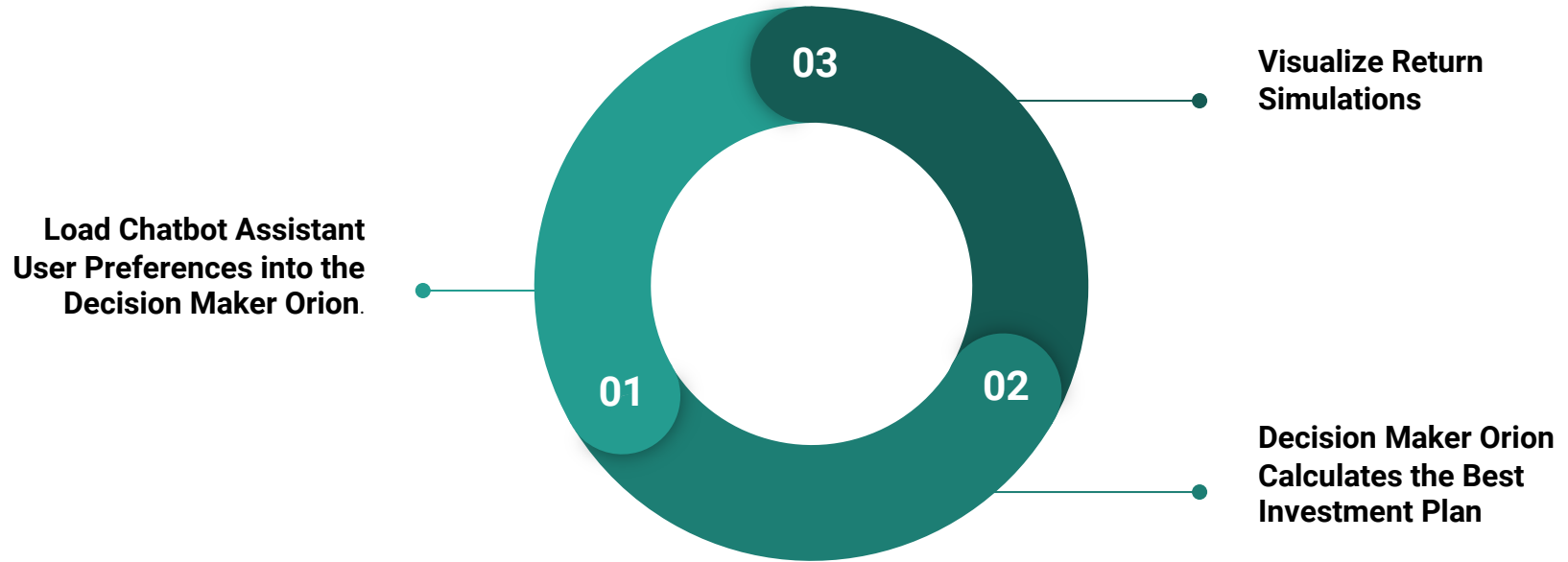
# Strategies Derivation
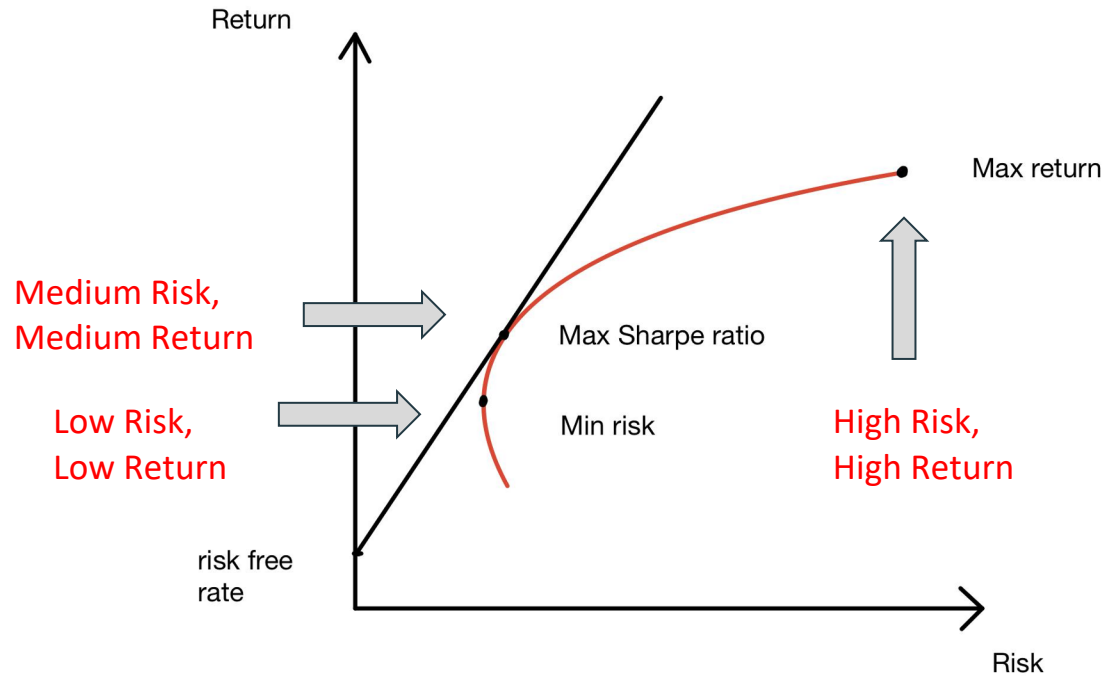
# 4. Result

We assume user inputs are:

- Initial cash = $10,000
- Holding period = 50 days
- Asset recommendations
  - SPY, VTV, VUG, GOVT, EEMV, CBOE, QQQ

Let's see what the results are
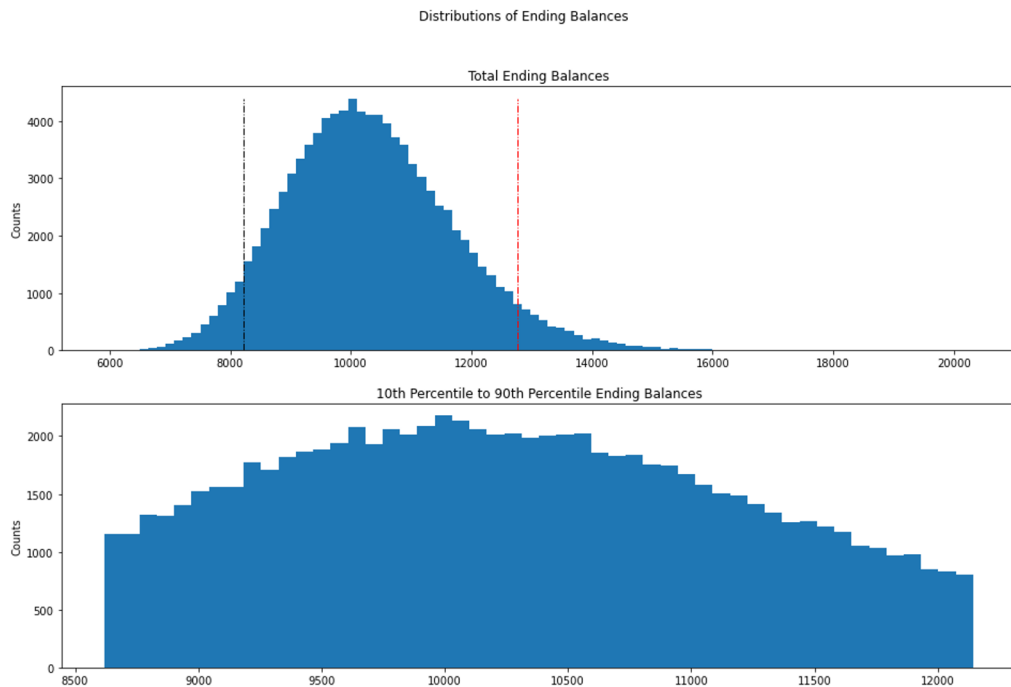for different Risk and Return Preferences!

# Results

We assume user **inputs** are:

- initial cash = $10,000
- holding period = 50 days
- needs for asset recommendation
- Prefers low risk and low return

**Outputs**: Cash Allocation

- $8431.7 in VUG
- $1215 in CBOE
- $248.98 in VTV
- $104.32 in SPY

## Distributions of Ending Balances

### Total Ending Balances



### 10th Percentile to 90th Percentile Ending Balances



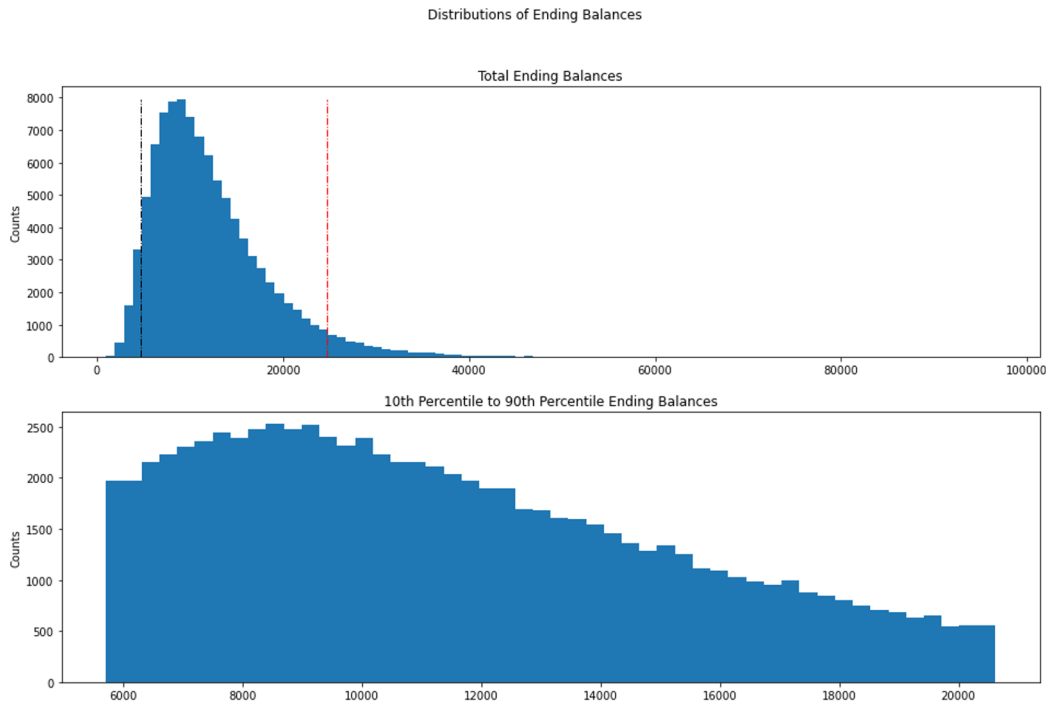| | |
|---|---|
| Number of values | 100000.000000 |
| Mean | 10328.178961 |
| Standard deviation | 1399.469008 |
| Skewness | 0.485311 |
| kurtosis | 0.592935 |
| 5% Perc | 8219.326762 |
| 95% Perc | 12770.989189 |
| Minimum | 5662.705922 |
| Maximum | 20581.713614 |

# Results

Use Case 2: Medium Risk, Medium Return Preference

We assume user **inputs** are:

- initial cash = $10,000
- holding period = 50 days
- needs for asset recommendation
- Prefers medium risk and medium return



Distributions of Ending Balances

Total Ending Balances

10th Percentile to 90th Percentile Ending Balances

**Outputs**: Cash Allocation

- $7915.21 in CBOE
- $2084.79 in GOVT

| | |
|---|---|
| Number of values | 100000.000000 |
| Mean | 12323.422154 |
| Standard deviation | 6568.481143 |
| Skewness | 1.653890 |
| kurtosis | 4.938173 |
| 5% Perc | 4724.021170 |
| 95% Perc | 24763.388095 |
| Minimum | 1174.167419 |
| Maximum | 88053.117376 |

# Results

Use Case 3: High Risk, High Return Preference

We assume user **inputs** are:
- initial cash = $10,000
- holding period = 50 days
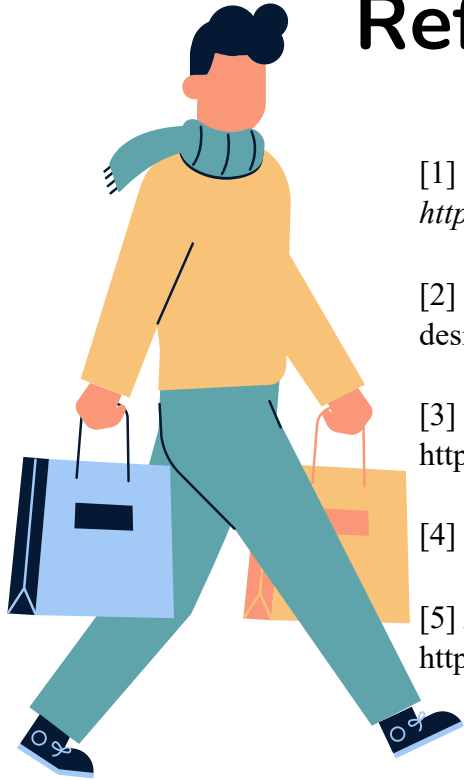- needs for asset recommendation
- Prefers medium risk and medium return



Distributions of Ending Balances

**Outputs**: Cash Allocation
- $10,000 in GOVT
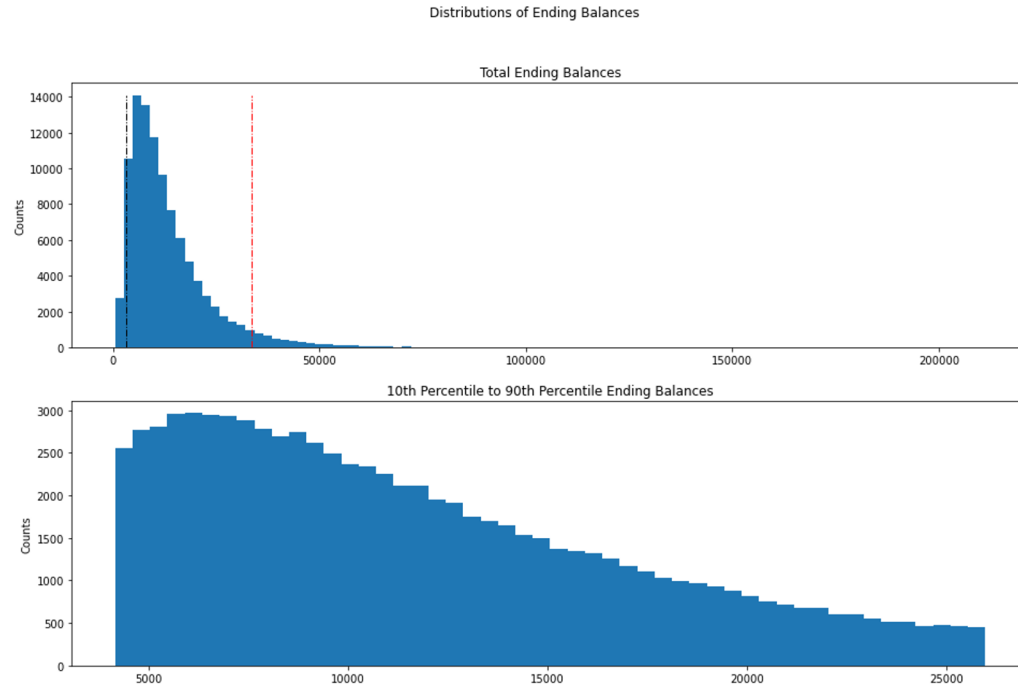
| | |
|---|---|
| Number of values | 100000.000000 |
| Mean | 13459.435076 |
| Standard deviation | 10787.637470 |
| Skewness | 2.782773 |
| kurtosis | 15.703256 |
| 5% Perc | 3182.554387 |
| 95% Perc | 33591.971355 |
| Minimum | 489.552890 |
| Maximum | 211240.748324 |

# References

[1] IBM Cloud Docs. (n.d.). Retrieved April 17, 2022, from *https://cloud.ibm.com/docs/assistant?topic=assistant-getting-started*

[2] ISO 9241-210:2019 Ergonomics of human-system interaction — Part 210: Human-centred design for interactive systems

[3] *Spy: SPDR S&P 500 ETF trust overview*. MarketWatch. (n.d.). Retrieved April 17, 2022, from https://www.marketwatch.com/investing/fund/spy

[4] Cboe Global Markets. Retrieved April 17, 2022, from https://www.cboe.com/

[5] *Ishares U.S. treasury bond ETF: Govt*. BlackRock. (n.d.). Retrieved April 17, 2022, from https://www.ishares.com/us/products/239468/ishares-us-treasury-bond-etf

# Thank you!