
How to train a trading bot

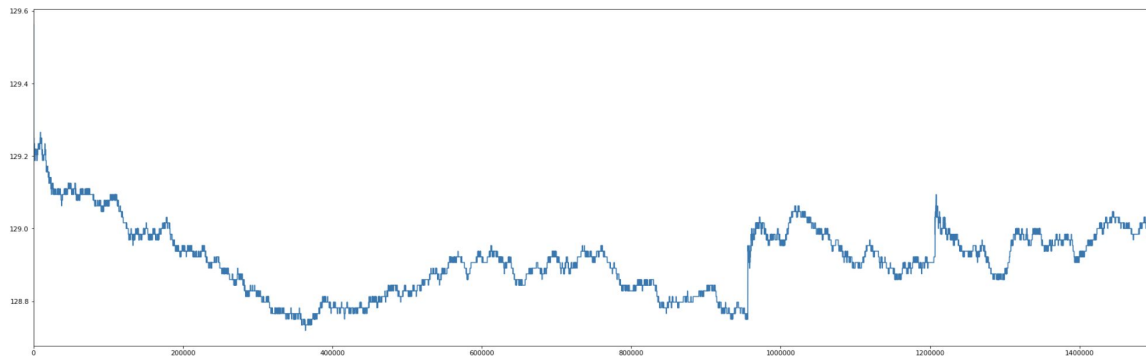
— -By Simran Arora —

OBJECTIVES

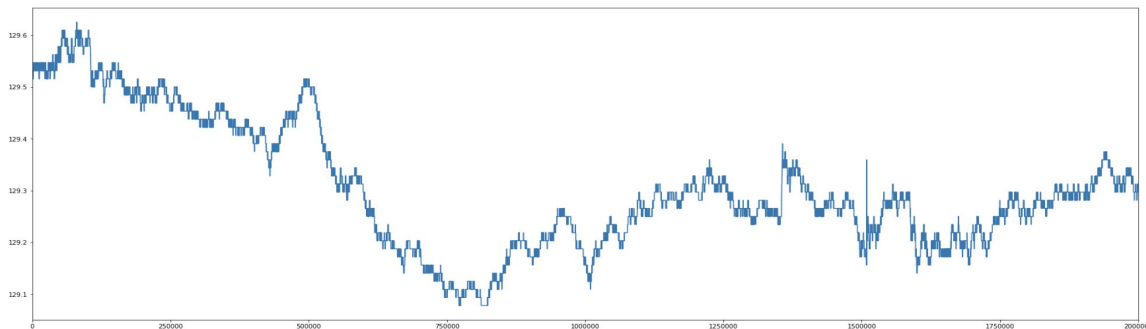
- Design and develop a trading env for offline learning that encapsulates various trading strategies, supports training on multiple commodities, and keeps implementation modular and simpler to adapt.
- Train and evaluate agents on offline data with tensor board support and result logging.
- Develop an infrastructure that supports running multiple training seeds and experiments.
- Train agents to make profit over their net worth

Training and Testing Data

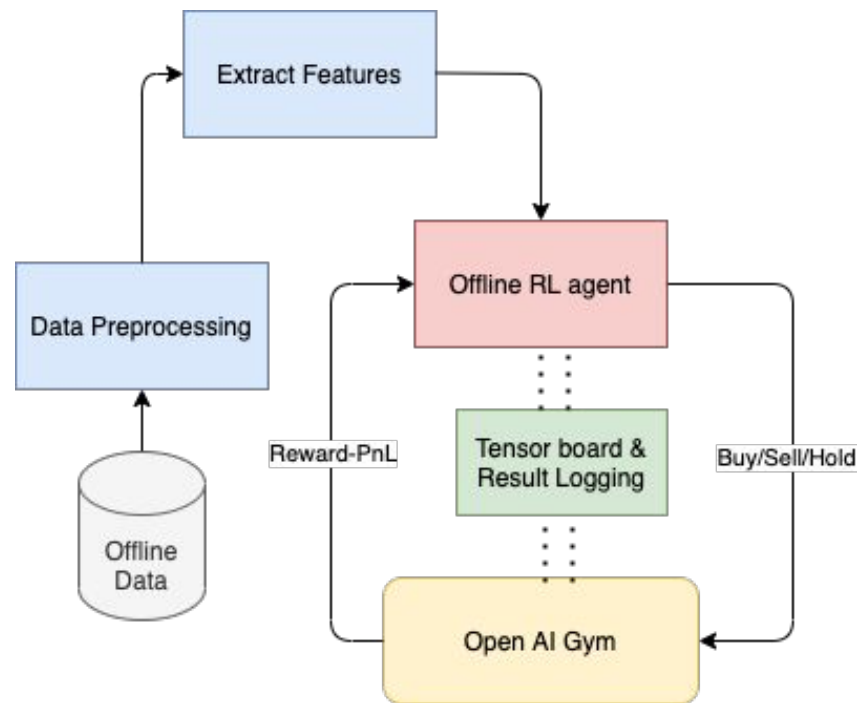
**Training Set for
Commodity ZNH0_MBO**



**Testing Set for
Commodity ZNH0_MBO**



DESIGN



EXPERIMENT DESIGN

- TRADING STRATEGIES
 - Simple: Buy at ask; Sell at bid
 - Midpoint: Buy at midpoint; Sell at midpoint
- ACTION SPACE
 - Discrete(11): [-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5]
 - Box: [-1, 1]
- OBSERVATION SPACE
 - Account_Securities_Bid_Ask
 - Account_Securities_DiscreteAction_Bid_Ask
 - Account_Securities_ContinuousAction_Bid_Ask
- NUMBER OF SEEDS PER EXPERIMENT = 2
- STARTING BALANCE = \$10,00,000
- TRAIN STEPS = 1.5 M
- TEST STEPS = 1.5 M

EXPERIMENT DESIGN continue...

#	Trading_Si mple	Trading_Mi dpoint	Action_ Discrete	Action_Conti nuous	Obs_noac tion	Obs_DisA ction	Obs_Co n_Action	# Commoditi es
1.	✓		✓		✓			1
2.	✓			✓	✓			1
3.		✓	✓		✓			1
4.		✓		✓	✓			1
5.	✓		✓			✓		1
6.	✓			✓			✓	1
7.		✓	✓			✓		1
8.		✓		✓			✓	1
9.	✓			✓	✓			3

EXPERIMENT 6

- TRADING STRATEGIES: Simple: Buy at ask; Sell at bid
- ACTION SPACE: Continuous
- OBSERVATION SPACE: Account_Securities_ContinuousAction_Bid_Ask

TRAIN

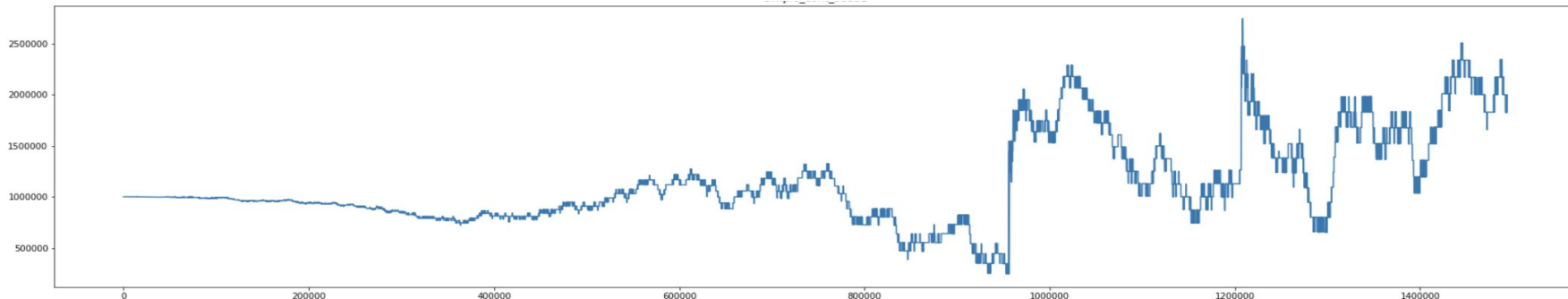
Net Worth: \$1,997,416

PnL: +\$997,416

OBSERVATIONS

- This policy only learned to make profit by borrowing. Might not be suitable in cases where we don't allow infinite borrow.
- Since it learned to maximize reward the policy converged at a very high value.

Net worth during Training



EXPERIMENT 9

- TRADING STRATEGIES: Simple: Buy at ask; Sell at bid
- ACTION SPACE: Continuous
- OBSERVATION SPACE: Account_Securities_Bid_Ask

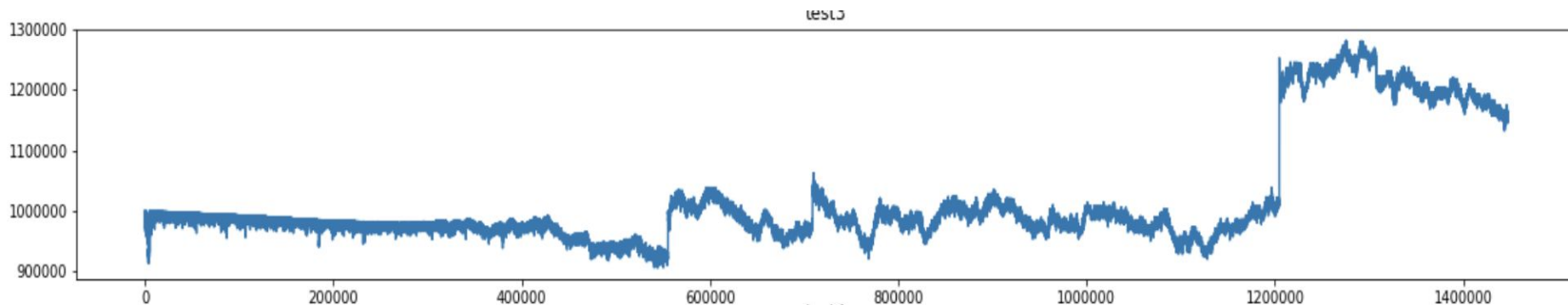
TRAIN

Net Worth: \$1149626
PnL: +\$149885

OBSERVATIONS

- It learned to maximize reward the policy converged at a very high value.

Net worth during Training



THANK YOU!