



TRADERS AT
BERKELEY

FEBRUARY 12-13TH, 2022

TRADERS AT BERKELEY TRADING COMPETITION CASE PACKAGE

HOSTED BY

Traders at Berkeley
traders.berkeley.edu

Berkeley, CA

TABLE OF CONTENTS



I. INTRODUCTION

<i>Welcoming Remarks</i>	3
<i>Sponsors</i>	4
<i>About Us</i>	5
<i>Event Schedule</i>	6
<i>Technology</i>	7
<i>Logistics</i>	8

II. TAHOE

<i>Introduction</i>	10
<i>Game Schedule</i>	15

III. NAPA

<i>Introduction</i>	16
<i>Game Schedule</i>	22

IV. YOSEMITE

<i>Introduction</i>	23
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V. CONCEPTS

<i>Expected Value vs Variance</i>	26
<i>Bid vs Ask</i>	27
<i>Market Making vs Market Taking</i>	28

INTRODUCTION



WELCOMING REMARKS

Thank you for participating in Traders at Berkeley's Intercollegiate Trading Competition! You will join fellow undergraduate and graduate students in various quantitative fields of study, including but not limited to Computer Science, Statistics, Mathematics, and Data Science, in a stimulating day of trading games and networking opportunities.

Participants will have the opportunity to network with trading firms throughout the full-day event. The competition will kick off with an opening ceremony after which participants will be put into random groups to trade against one another on a simulated trading platform developed by Traders at Berkeley. Throughout the day, participants have exclusive access to networking sessions hosted by our sponsors.

Participants are required to attend all sessions to be eligible for food vouchers and prize money. We encourage participants to get involved in as many opportunities as available to them to make the most out of the event.

Traders at Berkeley is dedicated to facilitating stimulating conversations and bridging the gap between professionals and students. We believe that this will be an unparalleled opportunity for students to explore their interest in a career in quant and trading. We are excited to kickstart that opportunity for all students.

SPONSORS



OUR SPONSORS

The Berkeley Trading Competition is proudly sponsored by:

PLATINUM SPONSORS



GOLD SPONSORS



SILVER SPONSORS



ABOUT US



TRADERS AT BERKELEY

Traders at Berkeley is UC Berkeley's undergraduate quantitative finance club dedicated to cultivating professional and academic interests in quantitative finance and trading. We are a group of students strongly interested in the field of quantitative finance who aim to spark interest in a wide range of quantitative strategies and trading schemes and create a real-time trading environment for future quants and traders. We contribute to the community by hosting a trading competition, teaching an introductory quantitative finance course, and connecting with industry professionals.

BERKELEY TRADING COMPETITION

The Berkeley Trading Competition is the first intercollegiate trading competition on the West Coast hosted by Traders at Berkeley.

For this year's edition, the club designed three proprietary games with various twists and turns to simulate an environment like the markets. The games are engineered to test the participant's intuitive understanding of probability and statistics.

Starting next year, we will build a competition that will support algorithmic capabilities. The electronic edition will test contestants on the capability of building a trading strategy that is dynamic and efficient to effectively respond to changing environments.

EVENT SCHEDULE

All times in Pacific Time (PT)



SATURDAY, FEB 12TH

9:10 AM	Opening Remarks
9:30 AM	Flow Traders Info Session
10:00 AM	Jane Street Info Session
10:30 AM	Game NAPA Round 1
11:30 AM	Break
11:45 AM	SIG Info Session
12:15 PM	Break
12:30 PM	Optiver Info Session
1:30 PM	Game NAPA Round 2
2:15 PM	HRT Info Session
2:45 PM	Game YOSEMITE (Office Hours)
4:45 PM	DRW Info Session
5:15 PM	Game NAPA Round 3
6:00 PM	End of Saturday

SUNDAY, FEB 13TH

9:00 AM	Game TAHOE
10:15 AM	Citadel Info Session
11:15 AM	Awards
12:00 PM	End of competition

TECHNOLOGY



ZOOM

The competition will be held virtually through Zoom, and all games will be held in breakout rooms. It will be extremely important for participants to have an environment with a good internet connection as you will be constantly sending information through Zoom and attending company networking events.

We strongly encourage you to turn on your camera when you can to fully interact with professionals and your fellow participants.

SLACK

We will primarily use Slack as the main form of communication for the competition. Participants will be constantly updated about game instructions through Slack, so please have notifications on for the workspace!

We will also use Slack to send Zoom breakout room numbers, distribute food vouchers, and submit requests.

#announcements

A channel for all official announcements for the Trading Competition

#logistics

A channel to clarify competition logistics

#networking

A channel to meet fellow participants and find teammates

#napa

#yosemite

#tahoe

Game channels to clarify game rules and match participants into teams

#random

A channel for anything!

LOGISTICS



TIME

This competition is a two-day virtual event from 9:10 AM PT to 6:00 PM PT on Saturday, Feb 12th, and from 9:00 AM PT to 12:00 PM PT on Sunday, Feb 13th. All events will be held in one zoom session and breakout rooms, and we expect all participants to be present on the zoom call throughout the event (except during breaks). Please be sure to join 10-15 minutes before the start of the event on both days.

Participants are required to attend all sessions to be eligible for the food vouchers and prize money. We will be taking attendance through Zoom throughout the day.

COMMUNICATION

All communication will be conducted through Slack. Participants must pay close attention to all incoming messages on Slack leading up to and throughout the event for pertinent logistical announcements and day-of updates.

Should any technical or logistical issue regarding zoom connection, breakout room assignment, etc., arise during the event, we will use a type of slack communication to address the problem. More information will be announced closer to the event.

GAMES

We will assign each participant to a Zoom breakout room for each game. Participants should promptly join the breakout rooms. All games will begin approximately one minute into each round.

LOGISTICS



SPONSOR EVENTS

We proudly present 7 of our sponsors who are innovators and leaders in the quantitative trading space. Participants are strongly encouraged to come prepared with questions for the professionals. All participants are required to attend all sessions to be eligible for food vouchers along with prize money.

VOUCHERS

A Doordash voucher will be distributed to each participant through email on Saturday morning, Saturday afternoon, and Sunday morning respectively. All voucher distributions will be contingent upon attendance at all sessions.

PRIZES

Participants are eligible for prize money upon completion of all game rounds and networking events. Tax information may be required after the competition for distribution. Competition team members will be in contact with winners shortly after the competition.



INTRODUCTION

On Sunday morning, we will play a fun game that will require you to estimate three unknown numerical facts, which are usually facts about members of our club or you (the participants of the trading competition). Your goal is to guess the true value of each of the three questions and trade them in the “market” consisting of other players of the round. You will be scored at the end of the round based on how close you are to the true values of the numbers and how much profit you’ve made by trading.

The game is meant to be simulating the trading activities in the actual market. You will be playing the roles of market makers in this game (See notes about Market Making in this package). For instance, you will be asked an unknown numerical fact such as the sum of age of participants of the trading competition. You will be guessing this number as if you are evaluating the true value of an Apple stock and trading this fact as if you are buying or selling the stock on your brokerage. You want to evaluate accurately the value of this fact because it helps you make trade decisions in the long term, but you also want to be able to trade consistently with other players so that you earn short-term profits.

HOW TO PLAY

You will be matched with 5 to 7 other players, and in each round, you will be able to make 4 trades for each of the 3 different numerical facts.

QUESTIONS

Three questions will be asked at the beginning of the 15 minutes. These questions will be carefully selected by the competition board to ensure that every participant has an equal chance of estimating the true value. You are required to make a market for the answer to each of the questions.



Because this competition will be held virtually, there will not be any “hard” facts, numbers that are googleable, but instead, the questions will require each participant to carefully adjust their expectations to existing known values.

An example question (not included in the actual competition) might be "What is the average SAT score among all participants?" A quick google search indicates that the average total score is 1051, but if we could assume that if there is a strong correlation between SAT scores and high academic achievement, our “guess” would most likely be closer to the 1500 range.

BID AND ASK

In each round, you will submit a bid and an ask price based on your guess (the meaning of bid and ask is explained later in the package), and the system will automatically match your prices with other players in the round: if your bid price has a greater value than the asking price of another player, you will be trading with that person at the average value of your bid and their ask. The system will prefer the more aggressive order, that is someone who is willing to buy at a higher price(bid) or sell at a lower price(ask). If your bid is 10 and there are two asks at 7 and 9, the system will match your bid of 10 with someone’s 7 instead of 9.

Going back to the SAT example, if you expect that the true average is 1500, you would submit a bid for 1495 and ask at 1505. You could also make the spread tighter at 1499 and 1501, given your confidence in the answer.

If your ask is lower than someone else’s bid, your trades will be matched at a midpoint price, giving price improvement for both parties. Your ask of 100, if matched with someone’s 120, will result in a trade at 110.

SIZING

You may also size your bid and ask, which means that you can offer different amounts of each quantity. If you are feeling cautious about a trade, you may want to offer 2 lots for each bid and ask.



For example, going back to the average SAT score example, if you are uncertain about the given estimate, you could submit a bid of 5 lots at 1495 and 5 lots at 1505. This would limit your loss in cases if your estimates are wildly off; however, this action would also limit your potential upside as well.

The maximum number of lots that you can submit for this round is 20 lots, and the minimum is 5 lots.

You may also submit asymmetric bids and ask sizes. For example, instead of submitting a symmetrical 5 lots at 1495 and 5 lots at 1505, you could submit a skewed one of 5 lots at 1495 and 15 lots at 1505 if you are more confident about the answer being slightly higher than 1500 or if you would like to cover more for your short position.

SPREAD

One of the most important components in the bid and ask is the spread. To facilitate more transactions and prevent players from playing too defensively, we will implement a spread limit on each question.

For each trade, you are allowed to submit a spread of 2, 5, and 10 once each. You can mix and match the spread to the question to your preference (i.e. Q1 - a spread of 5, Q2 - a spread of 2, Q3 - a spread of 10 or Q1 - a spread of 10, Q2 - a spread of 2, Q3 - a spread of 5, etc). As another example, you cannot use a spread of 5 twice (i.e. Q1 - 2, Q2 - 5, Q3 - 5 is not allowed as you used 5 twice and did not use a 10).

For example, if the 3 questions of the round were Q1 - Average SAT score of California, Q2 - Average SAT score of Texas, Q3 - Average SAT score of New York, you could submit q1 - 1499 and 1501 (2 spread), q2 - 1490 and 1500 (10 spread), and q3 - 1501 and 1506 (5 spread).



MARKET NEWS

To facilitate better estimations and add more twists to each game, we have prepared three market news events for each question. A sample market news for the SAT question would be over 50% of the participants have a score higher than 1500.

After each trade, you will be able to see the bid/ask prices and sizes of other players, the values of each trade, and your PnL (Profit and Loss) for this round. With this information and the additional market news, you would be able to make more educated guesses about the true value of each question.

SUBMISSION

For every trade, you will submit a market for all of the questions. To make a market, you must private message the moderator on zoom chat.

For each question, you must submit the bid and ask with the corresponding lots. For the first question, if you would like to make a bid for 5 with 6 lots and an ask of 10 with 8 lots, you will type q1 5 10 6 8. The first two numbers indicate the bid-ask and the last two numbers indicate the lots for each.

You will follow the same procedure for question 2 and question 3 as well. When it is time for submission, you should send a chat with a message like: "q1 5 10 6 8 q2 20 30 5 12 q3 210 212 10 11." This indicates that for question 1 your bid is \$5 with 6 lots and ask is \$10 with 8 lots, for question 2 your bid is \$20 with 5 lots and ask is \$30 with 12 lots, and for question 3 your bid is \$210 with 10 lots and ask is \$212 with 11 lots.

We will also provide a form where you can easily fill out the above information, and please make sure that your spread and the number of lots follow the rules as above!



SCORING

The PnL (Profit and Loss) of each trade will be calculated in the following method:

(The average value of your sells - The average value of the trades made on this numerical fact during this trade) x Your number of sells

- (The average value of your buys - The average value of the trades made on this numerical fact during this trade) x Your number of buys

The average value of trades made on this numerical fact during this trade is a value that changes each time. Just because Question 2 had an average value of 1450 from Trade 1 does not indicate that Q2 will have an average value of 1450 for Trade 2. This value will constantly change based on the participants' submitted bid and ask values.

Your PnL of the entire round will be calculated by the sum of PnL from each trade and the settled value.

The settled value indicates your position settled to the true value of the numerical fact. After 5 rounds if you are long 10 lots at an average price of 1450 and the true value is 1500, you will gain an additional $10 * (1500 - 1450) = 500$ to the score. If after 5 rounds you are short 3 lots at an average price of 1470 and the true value is 1500, you will add $3 * (1470 - 1500) = -90$ to the final score.

TIPS

1. You should not only keep in mind the bid/ask values of the other players but also try to guess the value as close to the true value as possible
2. However, don't be fixated on the true value. Similar to real life, company valuations and prices can be disconnected from its fundamental understanding due to many different reasons. It is important as a trader to evaluate situations where the disconnect from the true value is required.
3. Sizing will help out immensely for those who want to play defensively or offensively. You could also unload your long or short positions earlier if you do not wish to be affected by the "settled value" trade.

TAHOE SCHEDULE

All times in Minutes



- 1 Join your corresponding Breakout Room
- 2 Distribute the 3 Questions
- 3 (Time for Participant to Estimate)
- 4 (Time for Participant to Estimate)
- 5 Submit First Round Trades
- 6 Distribute First Market News
- 7 (Time for Participant to Estimate)
- 8 Submit Second Round Trades
- 9 Distribute Second Market News
- 10 Submit Third Round Trades
- 11 Distribute Third Market News
- 12 Submit Fourth Round Trades
- 13 Reveal True Value
- 14 (Extra Time)
- 15 Go on to next round



INTRODUCTION

As part of the competition, we will play another fun game that will test your ability to adapt to new information and respond to other player's actions.

At the start of the game, each player draws a card, without replacement, from a deck of cards numbered A to B, where A and B will be announced at the beginning of the game by the moderator. Each player gets to see only the value of their card, and the game's true value is computed as the sum of each player's card.

To help players deduce the value of the game, we will also periodically reveal the value of some of the cards still in the deck. In other words, the revealed cards were not drawn by any player, and are not involved in the calculation of the game's true value. Players are expected to adjust their strategies based on the new information (Hint: check out the section on expected value in this packet).

HOW TO PLAY

In this turn-based game, each round is defined as one person making a new market, and everyone else transacting the previously created market. A cycle is complete when each person has had a chance to make a new market (there will be X rounds in a cycle, where X is the number of players).

MAKING A MARKET

On your turn, you will create a market for the other players. If you made an order in the previous round, you can pick your new bid and ask independently of the previous market. However, if you did not make an order in the previous round, your new market must either have a higher bid or a lower ask than the previous market. For example, if the previous market had a bid of 130 and ask of 140, you can make the bid higher with 131 and 140, make the ask lower with 130 and 139 or do both with 131 and 139.



SIZING

Similar to Tahoe, you may also size your bid and ask, which means that you can offer different amounts of each quantity. If you are feeling cautious about a trade, you may want to offer 5 lots for each bid and ask. You may have a bid for 120 with 5 lots and an ask at 130 with 5 lots or have a bid for 120 with 20 lots and an ask at 130 with 10 lots.

Note that even if your bid (or ask) price is the same as the previous market's bid (ask), the lot size you choose will replace the previous one. For example, if the previous market has a bid of 5 lots at 130 and you place a bid of 10 at 130, the market will now have a bid of 10 at 130, and the other players, if they choose to sell, will transact with you.

The minimum and maximum allowed lot sizes will be announced at the beginning of the game by the moderator.

SPREAD

Similar to Tahoe, we will implement a spread limit on the market.

As an example, if the maximum spread is 50, you may submit a market with a bid for 100 and an ask at 150. You may not submit a market with a bid for 100 and an ask at 160. Similarly, if the minimum spread is 4, you may also submit a market with a bid for 100 and an ask at 104. If the previous market has a spread of 4, you must transact.

The maximum and minimum spreads will be announced at the beginning of the game.



TRANSACT

Once someone else has made a market, it will be your turn to transact. You will submit a transaction by deciding if you would like to buy or sell and choosing the size of the transaction. The size of the transaction cannot exceed the sizing provided by the market maker. If the player before you created a market of 5 lots at 130 and 8 lots at 140 and you would like to transact, you can either buy up to 8 lots at 140 or sell up to 5 lots at 130.

As a note, you are not required to transact the full order book. You may choose to only purchase 1 lot even though 8 are provided. This spread and sizing can be any number that is under the previous rules that adhere to the maximum/minimum spread and maximum/minimum lots.

Periodically, a card from the deck (not the ones drawn by each player at the start) will be revealed. You may wish to adjust your expected value according to the new value.

ORDER

The order of the market makers within each cycle will be randomly decided for each cycle. Thus, you may be the first market maker in one cycle but the fourth market maker in the next cycle. This random ordering forces each player to be alert to every new trade as you won't know that it is your turn until your name shows up on the screen.

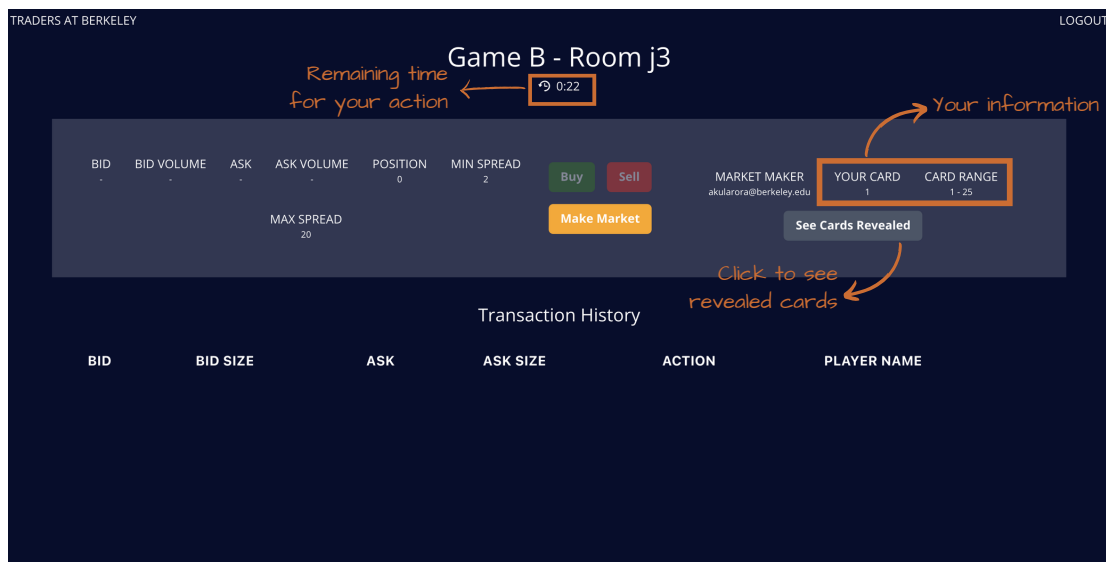
TIMING

When it is your turn to make a market, you will have 40 seconds. When it is your turn to transact, you and the other players will have 25 seconds to submit your buy/sell orders, and the orders will be implemented on a first-come, first-serve basis (speed of order submission matters).

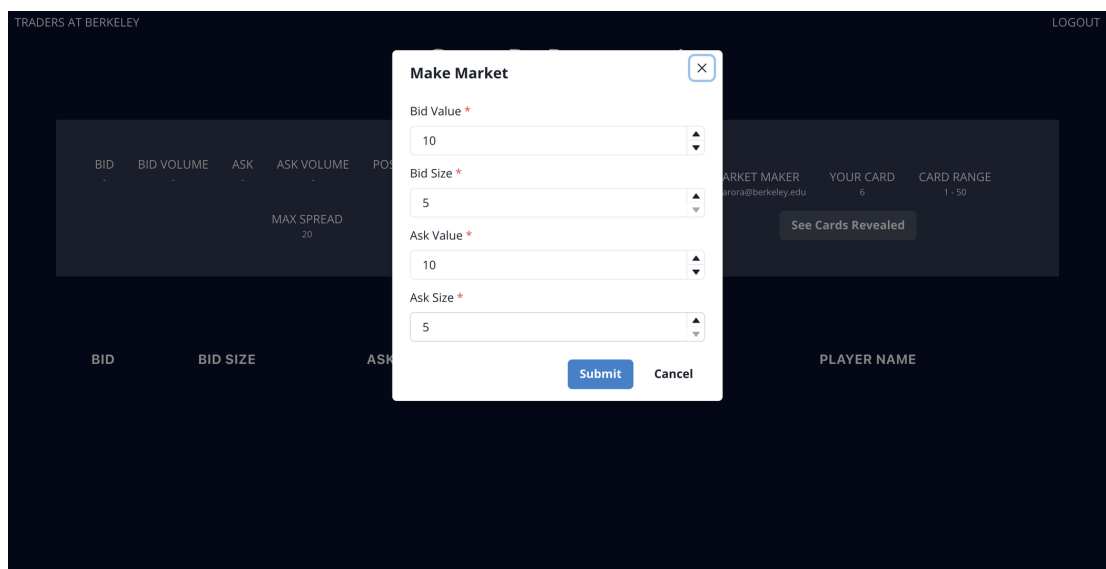


NAVIGATING THE PLATFORM

To transact or make a market, you will enter your commands in a web GUI.



When it is your turn to make a market, you will see a screen such as the above. Note the annotated features to keep track of the game state. Click on **Make Market** to submit your market.





TRADERS AT BERKELEY LOGOUT

Game B - Room j3

🕒 0:04

BID	BID VOLUME	ASK	ASK VOLUME	POSITION
5	5	25	20	5

MIN SPREAD	MAX SPREAD
2	20

Buy
Sell

MARKET MAKER
 abhishek.kumar@berkeley.edu

YOUR CARD
 1

CARD RANGE
 1 - 25

Make Market
See Cards Revealed

Transaction History

→ Previous actions

BID	BID SIZE	ASK	ASK SIZE	ACTION	PLAYER NAME
5	5	25	20	MADE MARKET	abhishek.kumar@berkeley.edu
				SELL 5 AT 8	abhishek.kumar@berkeley.edu
8	5	20	5	MADE MARKET	akularora@berkeley.edu

When it is your turn to transact, you will see a screen such as the above. Note the annotated features to keep track of the game state. Click on either **Buy** or **Sell** to submit your order.

TRADERS AT BERKELEY LOGOUT

Buy

Size *

1

Submit
Cancel

BID	BID VOLUME	ASK	ASK VOLUME	MIN SPREAD	MAX SPREAD
5	5	25	20	2	20

Make Market
See Cards Revealed

Transaction History

BID	BID SIZE	ASK	ASK SIZE	ACTION	PLAYER NAME
5	5	25	20	MADE MARKET	abhishek.kumar@berkeley.edu
				SELL 5 AT 8	abhishek.kumar@berkeley.edu
8	5	20	5	MADE MARKET	akularora@berkeley.edu



SCORING

At the end of the game, your final score will be computed as the sum of your PnL and the value of your current position. For example, if player A has accrued a PnL of 35 and a position of +3 (ie. a long position), and the true value of the game is 100, then player A's final score is $35 + 3 \cdot (100) = 335$. On the other hand, if player B has accrued a PnL of 500 and a position of -4 (ie. a short position), then player B's score will be $500 - 4 \cdot (100) = 100$. Having the higher score of the two, player A would be declared the winner.

You will receive a penalty if your turn times out. However, due to the possibility of internet issues causing timeout, we will not be including penalties in your final score unless you have more than three timeouts.

TIPS

1. Unlike Tahoe, the true value of the number matters as the profit and loss are directly correlated with your ability to estimate the number and a reasonable confidence interval.
2. Adjust your sizings to take advantage of your remaining lots. If you are heavily long, you may want to reduce your risk by increasing your lot size for the ask.
3. If you heavily skew your market in a certain direction, you may reveal too much information about your card and lose your advantage.

NAPA SCHEDULE

All times in Minutes



- 1 Join your corresponding Breakout Room
- 2 Distribute Cards
- 3 Play Game
- 4 Play Game
- 5 Play Game
- 6 Play Game
- 7 Play Game
- 8 Play Game
- 9 Play Game
- 10 Play Game
- 11 Play Game
- 12 Play Game
- 13 (Extra Time)
- 14 (Extra Time)
- 15 Release Next Round Information



EDGE MODELING

Traders at Berkeley recently created their own high frequency trading strategy, acting on 4 stocks traded across 3 markets. However, we have noticed that there has been a large discrepancy between our predicted and realized edge and want to understand where this slippage is coming from. Your goal is to predict the realized edge, or how much Traders is actually earning per trade, and use that information to decide which trades in the test set will have positive realized edge. We have provided relevant information about each trade, explained in the Dataset section. You may use any of the features provided.

DATASET

In *train.csv*, we provided information about each of the trades from our strategy. The features included are

- *pred edge*: The predicted edge, or returns, that our strategy generated
- *stock*: Stock that was being traded (A, B, C, or D)
- *location*: Exchange the trade took place (NYSE, NASDAQ, or CSE)
- *price*: Price of the shares in the transaction
- *size*: Size of the transaction
- *dir*: Whether our strategy bought or sold (B or S)
- *counterparty*: Who we traded against (HF, MF, or R)
- *sentiment*: A score from -100 to 100 on how bearish/bullish retail investors

We are trying to predict

- *realized edge*: The amount Traders actually earned on that trade

While developing the strategy, Traders hired some unpaid interns to scrape data on the *counterparty* and *sentiment*. However, because we never paid them, the interns did a bad job on recording the data and we believe that 30-40% of the data in those columns are incorrect.

Additional files will include *test.csv*, the test set which you will predict on, and *sample.csv*, which shows a sample submission.



SCORING

For each data point provided, your goal is to predict which trades in the test set had realized positive edge. You are going to predict whether these trades were positive or negative as a one-hot encoded vector and submit to Kaggle. An alternative way of thinking about this is classifying which trades in the test set are going to make Traders at Berkeley money. Your score will be the PnL of trades you think would lead to a positive realized gain.

At some point in the competition, we are going to host an auction where teams can pay for higher quality data. Each team will independently put in a bid and we will provide the top 5 teams data sourced by paid experts and may assume that the data is entirely accurate at that point. However, we will deduct the 6th highest bid from each team's PnL that obtained the accurate data. The bid will be due on Saturday at 3 pm and any team that does not submit a bid will automatically bid 0. In the event that there is a tie in bidding, we will give priority to whoever submitted their bid earlier.

TIMELINE

The data will be released and the Kaggle competition will open on Friday night of the competition, along with a message on Slack signaling its release. The Kaggle will be open until Sunday at 9 am and you may submit up to 10 times per day. Please familiarize yourself with the Kaggle platform before the start of the competition to avoid any technical difficulties.

We will be having office hours on Saturday from 2-4 pm, where you can come in a Zoom call and ask whatever questions you may like.

Finally, the auction bids are due on Saturday at 3 pm and we will send the expert data to the top 5 bidders by 3:30 the same day.



TEAM FORMATION

Everyone will form groups of 2-3 people prior to the competition beginning. We will have an Introductions channel in the Slack to find and meet teammates. There will be a Google Form for submitting team members and we ask that one person from each team complete the form. The form will be due Thursday at 11:59 pm PST. Anyone who does not submit a form will be randomly assigned to a team. Official teams will be released on Friday afternoon. We will then release a second Google Form asking for team name and corresponding team members. Please use the team name you submit when submitting to the Kaggle.

EXPECTED VALUE VS VARIANCE



Here are some useful concepts for playing probabilistic games.

EXPECTED VALUE

Suppose we have a distribution X of several possible real-valued outcomes x_1, x_2, \dots, x_n , occurring with probabilities p_1, p_2, \dots, p_n respectively. The expectation (or expected value) of X , denoted $E(X)$, then gives an “average” over the possible outcomes of X – if we sampled the distribution many times, the average of the results would be close to $E(X)$.

$E(X)$ is calculated using this formula: sum of all $x * p$. For example, the expected value of rolling a fair 6-sided dice would be the average of the numbers 1 to 6 (ie. 3.5), since every outcome has equal probability. Another example: Suppose we are betting on the outcome of a fair coin toss - we win \$100 for heads, and lose \$50 for tails. The expected payout of the game would then be $\$100(0.5) - 50(0.5) = 25\$$.

Of course, this concept applies to much more than dice rolls and coin tosses - for any probabilistic process (including those in our games and the markets), the expected value gives us a quantitative “average” of the possible outcomes. We can then use this quantity to make decisions. For instance, if we expect a stock's final value to be \$100 and the current ask is \$80, we should buy the stock.

VARIANCE

The variance $\text{var}(X)$, on the other hand, gives a sense of how “risky” a strategy is, or how close the actual outcome might be to the expected value. Given a distribution X , it is computed as $E((X-E(X))^2)$.

Generally, a strategy with lower variance is better, because its outcome is likely to be closer to the average, which means it is less risky. For example, suppose you were preparing for finals and you had 2 options: take the exam fairly, which guarantees you 80 points, or to cheat, which might get you 100 points. If you choose the latter, however, there is a 20% chance of getting caught and receiving 0 points. Both strategies have an expected value of 80 points, but the second option has a much higher variance, and therefore more risk, so we would (hopefully) choose the former.

BID VS ASK



BID AND ASK

A bid refers to the maximum price of an asset at which a buyer is willing to pay, and it is typically lower than the asset's last traded price. An ask refers to the minimum price of an asset at which a seller is willing to give, and it is typically higher than the asset's last traded price.

THE BID-ASK SPREAD

The bid-ask spread refers to the difference in the value of an asset between the bid and the ask prices. It usually depends on the liquidity and volatility of the asset: if the trading volume is high, the spread is more likely to be smaller, and vice versa. Market makers make a profit from this spread, and it is up to the maker the range of the spread, and sometimes they have to adjust the range not only to balance the asymmetric information in the market but also to make more profit for themselves.

By setting the range of the spread, the market makers face a tradeoff between profit per trade and overall market participation: If the spread is too narrow, the maker is likely to earn less profit per trade, but more investors are willing to trade from them; however, if the spread is too wide, the market maker may earn more profit per trade, but fewer or no investors may take the price. So market makers should constantly balance their risks and returns by making a market and their frequency of trading.

MARKET MAKING VS MARKET TAKING



Traders usually take the role of either a market maker or a market taker.

MARKET MAKER

Market makers act as middlemen that match the buyers and sellers. They generate liquidity in the market to ensure that trades on both sides (buy or sell) can get executed at the best price available by providing a bid price (lower) for potential sellers and an ask price (higher) for potential buyers based on the volatility and current price of the asset. Market makers typically do not take positions (i.e. not betting if the security will go up or down) but constantly adjust their risk parameters to be as involved in many transactions as possible. They are also paid maker-taker fees, also known as the payment of order flow so that they are encouraged to make more liquidity.

MARKET TAKER

Market takers are urgent in entering a trade or covering their position so that they are willing to take whatever price that is offered by the market makers. Usually, market takers make a profit based on their positions (whether it is a long or a short depending on their discretion of the market) and enter the market when they need to, so they are not as active as the market makers. They are charged the maker-taker fees to pay the market maker for the liquidity the makers generate.