

## Arbitrage Betting

Legalized sports betting has become one of the fastest growing industries across the globe. Since it became legal in the US 4 years ago, the industry has garnered almost \$8.7 billion dollars and is expected to reach \$99.2 billion by the end of this year, as reported by the American Gambling Association. There are 3 main factors that make up the sports betting industry: the bettor, the game being bet on, and the bookie. A bookie is a term for a person, website or company that facilitates gambling on the sports event. A bookie sets the odds (who is more likely to win), accepts and places bets, and pays out the winnings on behalf of the bettor. One factor that goes unnoticed by amateur sports bettors is the “juice”. Every single bet has juice attached to it, which generally plays in favor of the bookie. Here’s how the juice behind a bet works:

Consider a football game where the Bears are set as 3.5 point favorites over the Lions. Whether bettors want to wager on the Bears at -3.5 or Lions at +3.5, the bet will rarely be offered at even money (meaning spend \$100 to make \$100). Most oddsmakers will offer each side at -110 odds. This means bettors will have to spend \$110 to win \$100. The \$10 on the \$100 is what we call the “juice”, and is what bookies take home. From the bookies perspective, if they run a perfectly balanced book offering 9% juice on each bet, they will make a profit of 9%. With these factors in play, bookmakers have a big advantage in every scenario, as long as they have multiple people willing to take these bets. We want to give the bettor a leg up, which is what we plan to do with our final project app.

For our solution, we created an app that can identify discrepancies of odds between different bookies and formulate a betting strategy that guarantees the bettor a profit. This style of betting is called Arbitrage betting. Our app supplies live real time odds from each bookie and it

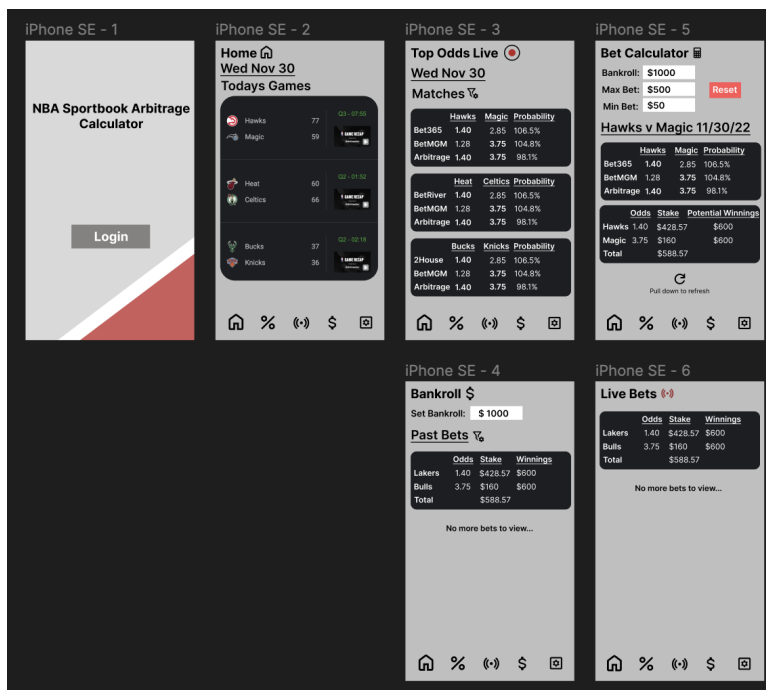
shows the user the best odds for each team playing in the game chosen. This tool gives a massive advantage to the bettors, and puts the bookies at more risk than the bettor. In order to ensure the bet hits, we used this equation  $(1/\text{Odds Team 1} + 1/\text{Odds Team 2}) = \%$ . If the outcome of the equation is 100% or below, the bet will hit, but if the outcome is above 100%, the certainty of the bet hitting decreases, and the odds will start to drift back in favor of the Bookies. Once the user has found a certain bet that satisfies the outcome, the app will show the amount of money they will need to bet on each team in order for profit. Our app will focus on the odds that pertain to the NBA, which consists of thirty teams.

An area of work that is similar to our project is the world of Crypto Currencies. Crypto Currencies are digital assets, which are made by cryptographic techniques that allow people to buy, sell or trade them in a safe manner. The main goal of Crypto Currency is to take away power from the government's traditional currency. Crypto is referred to as coins or tokens, which are meant to be exchanged for goods and services. Its value is determined by how high the demand is for the reason that different currencies may set a limit on how much is available. The world of Crypto and Sports betting are very similar because just like sports betting, Crypto is also a form of gambling because there are very few ways of knowing how the value of crypto will change. Luckily, there is a way to use the arbitrage method for crypto currencies. The way to find discrepancies in Cryptocurrencies is by using a specific type of arbitrage called Spatial arbitrage. This is the simplest arbitrage method in the crypto space and it involves trading Crypto across two different exchange platforms. This creates a discrepancy which allows people to make profits in a straightforward manner. One easy way to find discrepancies in different exchange platforms is by using calculators online that follow the same methods our app uses. One crypto arbitrage calculator is called CoinGlass and it lists multiple different exchange platforms with

different cryptos in each, which is similar to how we list different bookies with different odds for teams.

Bookies		Games		Odds		Outcomes
Name PK		Game, PK		Game, PK FK		Game, PK, FK
ID		Status		Commencement		Team_1
		Team_1		Status		Team_2
		Team_2		Sportsbook		Winner_Team
				Odds 1		
				Odds 2		
				Team_1		
				Team_2		

Here is an outline of our schema diagram. Everything falls under the Bookies and the order goes from bookies to games to odds to outcomes, and connecting outcomes back to bookies.



Here are the results of how the app would look if it was finished. It showcases the process of how the user would navigate the app.

## References

- <https://www.coinglass.com/FrArbitrage>
- <https://www.sofi.com/learn/content/crypto-arbitrage/#:~:text=Cryptocurrency%20arbitrage%20is%20a%20strategy,on%20one%20exchange%20versus%20another.>
- <https://thearbacademy.com/arbitrage-basketball/>