

Poker Playbook Analysis: A Comparative Study of Winner and Losing players

Presentation n

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Poker Hand Rankings



Straight:

Five consecutive cards of different suits.

Three of a Kind:

Three cards of the same rank.

Two Pairs:

Two sets of two cards with the same rank.

One Pair:

Two cards of the same rank.

High Card:

The highest card in the hand

Poker terminology





Measures winnings per 100 hands 1bb/100 = 0.20 cents per 100 hands 10bb/100 = 2 euros per 100 hands - 10bb/100 = - 2 euros per 100 hands **Voluntarily put money in pot(VPIP)**

Percentage of Hands a Player plays



Background and Methodology

01

Project Details

The primary goal of this project was to dive into players behavior in online poker, focusing on the NL 25 room of PokerKing.

By analyzing strategies employed during gameplay, we aimed to uncover insights into winning and losing player dynamics.

02

Data Details

We acquired a substantial dataset of 1.5 million poker hands from HH dealer.

This raw data was then transformed into a usable format through PokerTracker, facilitating its analysis. The dataset was further refined and processed using Jupyter Notebook and SQL to draw meaningful conclusions.

03

Hypothesis testing

Our project's hypothesis centered around understanding which specific gameplay statistics had the most influence on winnings and losses.

Through rigorous statistical testing, we aimed to pinpoint these influential factors and establish their significance in player performance.

04

Logistic regression

To gain a deeper understanding of player types, we classified participants as either "sharks" (successful players) or "fishes" (less successful players) based on their in-game winnings. Utilizing logistic regression, we modeled the relationships between various statistics and player classification, imrpoving our insights into the distinct strategies adopted by different player categories.

Key findings on hypothesis testing

Null Hypothesis (HO): The means of all the statistics are the same for "Fish" players compared to "Shark" players.

Alternative Hypothesis (Ha): At least one of the means of all the statistics are different for "Fish" players compared to "Shark" players.

With a 95% confidence level, the results indicated that the means of several statistics significantly differ between "Fish" and "Shark" players therefore we reject HO and confirm the Ha:(At least one of the means of all the statistics are different for "Fish" players compared to "Shark" players.)



Sharks(winning players)

- -Play less hands in general (VPIP mean: 24.8%)
- -Call less hands (Call any preflop raise mean: 13.5%)
- -Make less limps (Limp mean: 1.1%)
- -Are more agressive when playing (3 bet mean: 8.7%)(4bet mean: 7.65%)
- -Give up more versus agression when playing (Fold to 3 bet mean: 75%) (Fold to 4 bet + mean: 60%)



Fishes(Losing players)

- -Play more hands in general (VPIP mean: 28.8%)
- -Call more hands (Call any preflop raise mean:21.4%)
- -Make more limps (Limp mean: 4.5%)
- -Are less agressive when playing (3 bet mean: 7.7%) (4bet mean: 6.2%)
- -Give up less versus agression when playing (Fold to 3 bet mean: 70.5%) (Fold to 4 bet + mean: 56.8%)

Diving deeper into findings



Sharks(winning players)

- -Play less hands in general (VPIP mean: 24.8%)
- -Call less hands (Call any preflop raise mean: 13.5%)
- -Make less limps (Limp mean: 1.1%)
- -Are more agressive when playing (3 bet mean: 8.7%)(4bet mean: 7.65%)
- -Give up more versus agression when playing (Fold to 3 bet mean: 75%) (Fold to 4 bet + mean: 60%)

Avg Played hands by sharks (VPIP)

KQs QQ QJo QTo Q9o	KJs QJs JJ JTo	UTs UTs IT	(K9s) (Q9s) (J9s) (T9s)	K8s Q8s J8s T8s	Q7s J7s T7s	Q6s J6s	K5s Q5s J5s	K4s Q4s J4s	K3s Q3s J3s	K2s Q2s J2s
QJo QTo Q9o	JTo J9o	JT:	J9s T9s	J8s	J7s	J6s	J5s	J4s		
QTo Q9o	JTo J9o	II	T9s						J3s	J2s
Q9o	J9o			T8s	T7s	Title	ve.			
		T90	00			100	T5s	T4s	T3s	T2s
Q8o			99	98:	97s	96s	95s	94s	93s	92s
	J8o	T8o	98o	88	87s	86s	85s	84s	83s	82s
Q7o	J7o	T70	97o	87o	77	76s	75s	74s	73s	72s
Q6o	J6o	T6o	96o	86o	76o	66	65s	64s	63s	62s
Q5o	J5o	T5o	95o	85o	75o	65o	55	54s	53s	52s
Q4o	J4o	T4o	94o	840	740	64o	54o	44	43s	42s
Q3o	J3o	T3o	93o	830	730	630	530	430	33	32s
Q2o	J2o	T2o	92o	82o	72o	62o	52o	42o	32o	22
	Q60 Q50 Q40 Q30 Q20	Q60 J60 Q50 J50 Q40 J40 Q30 J30 Q20 J20	Q60 J60 T60 Q50 J50 T50 Q40 J40 T40 Q30 J30 T30 Q20 J20 T20	Q60 J60 T60 960 Q50 J50 T50 950 Q40 J40 T40 940 Q30 J30 T30 930 Q20 J20 T20 920	Q60 J60 T60 960 860 Q50 J50 T50 950 850 Q40 J40 T40 940 840 Q30 J30 T30 930 830 Q20 J20 T20 920 820	Q60 J60 T60 960 860 760 Q50 J50 T50 950 850 750 Q40 J40 T40 940 840 740 Q30 J30 T30 930 830 730 Q20 J20 T20 920 820 720	0 Q60 J60 T60 960 860 760 66 Q50 J50 T50 950 850 750 650 Q40 J40 T40 940 840 740 640 Q30 J30 T30 930 830 730 630 Q20 J20 T20 920 820 720 620	Q60 J60 T60 960 860 760 66 65s Q50 J50 T50 950 850 750 650 55 Q40 J40 T40 940 840 740 640 540 Q30 J30 T30 930 830 730 630 530 Q20 J20 T20 920 820 720 620 520	Q60 J60 T60 960 860 760 66 65s 64s Q50 J50 T50 950 850 750 650 55 54s Q40 J40 J40 T40 940 840 740 640 540 44 Q20 J20 T20 920 820 720 620 520 420	Q60 J60 T60 960 860 760 66 65s 64s 63s Q50 J50 T50 950 850 750 650 55 54s 53s Q40 J40 T40 940 840 740 640 540 44 43s Q20 J20 T20 920 820 720 620 520 420 320

Avg call any preflop raise by sharks(cpfr))

AA	AKs	AQs	AJs	ATs	A9s	A8s	A7s	A6s	A5s	A4s	A3s	A2s
AKo	KK	KQs	KJs	KTs	K9s	K8s	K7s	K6s	K.5s	K4s	K3s	K2s
AQo	KQo	QQ	QJs	QTs	Q9s	Q8s	Q7s	Q6s	Q5s	Q4s	Q3s	Q2s
AJo	KJo	Q١٥	IJ	JTs	J9s	J8s	J7s	J6s	J5s	J4s	J3s	J2s
ΑTο	KTo	QTo	JΤο	TT	T9s	T8s	T7s	T6s	T5s	T4s	T3s	T2s
A90	К9о	Q9o	J90	T90	99	98\$	97s	96s	95s	94s	93s	92s
A8o	K8o	Q8o	J8o	T8o	980	88	87s	86s	85s	84s	83s	82s
A70	K70	Q7o	J7o	T70	97o	87o	77	76s	75s	74s	73s	72s
A6o	K6o	Q6o	J6o	T6o	960	86o	760	66	65s	64s	63s	62s
A50	K50	Q5o	J5o	T5o	950	85o	750	65o	55	54s	53s	52:
A40	K4o	Q4o	J40	T4o	940	84o	740	64o	54o	44	43s	420
A30	K3o	Q3o	J3o	Т3о	930	83o	730	63o	53o	430	33	32s
A20	K2o	Q2o	J2o	T2o	920	82o	720	620	52o	42o	32o	22
	•		,									
PFR:	: 8.7 VPIP: 22.3						atrix					

Avg limp by sharks





Fishes(Losing players)

- -Play more hands in general (VPIP mean: 28.8%)
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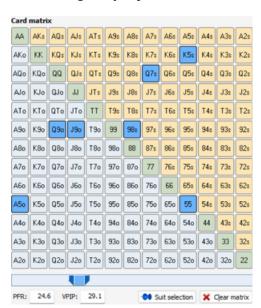
Avg Played hands by fishes (VPIP)



Avg call any preflop raise by fishes(cpfr))



Avg limp by fishes



List of hands that Fishes play and sharks don't: List of hands that Fishes call and sharks don't:





List of hands that Fishes limp and sharks don't:



Logistic regression

Our logistic regression model was designed to predict player types (Fish or Shark) using significant gameplay statistics. The model achieved a high accuracy of 93.55%, showcasing its ability to classify players.

Precision, recall, and F1-score metrics further validate its performance. Fish players were classified with a precision, recall, and F1-score of 0.95 each, while for Shark players, these metrics were at 0.91.

By selecting statistics with proven influence on winnings through hypothesis testing, we crafted a model capable of differentiating good players from bad players.

These insights allowed us to create a robust classification model.

The detailed confusion matrix revealed that only 6 instances each of sharks and fishes were misclassified, highlighting the model's reliability in player type prediction.

In summary, our logistic regression model is a potent tool for predicting player types based on gameplay statistics. This predictive capability allows us to understand player behavior and refine poker strategies with actionable insights.

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_cation Report:\n", reportusion Matrix:\n", conf_matrix)

odel Accuracy: 0.9354838709677419

Classification Report:

	precision	recall	f1-score	support
Fish	0.95	0.95	0.95	116
Shark	0.91	0.91	0.91	70
accuracy			0.94	186
macro avg	0.93	0.93	0.93	186
weighted avg	0.94	0.94	0.94	186

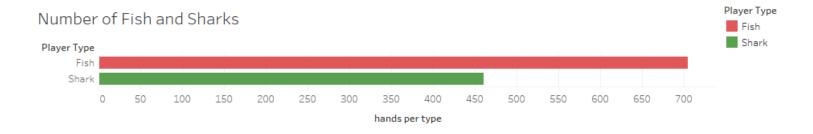
Confusion Matrix:

[[110 6] [6 64]]

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Data Visualizations with Tableau: Insights through Interactive Graphics

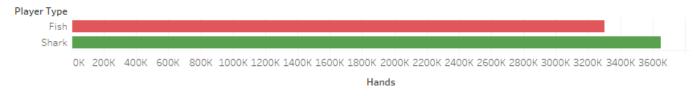


Number of player by type:

Fishes: 704 Sharks:460

Total players: 1164



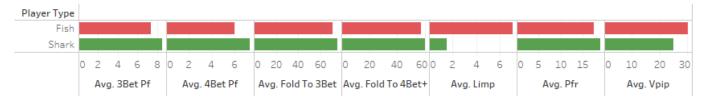


Total hands played by type:

Fishes: 3 301 180 Sharks:3 652 707

Total hands played: 6 953 887

Average statistics for sharks(winning) and fishes(losing) players



Avg

winnings/100

hands

Player Type

Fish -19.88

Average winnings bb/100 by type:

Fishes: $-19.88 == -(0.25 \times 19.88) == Lose 4.97\$$ per 100 hands on average

Sharks: 10.15 == 0.25 +10.15 == Win 2.54\$ every 100 hands on average

Lab: Identifying fishes through statistics

Read Me: The goal of this lab is to identify if a player is likely to be a fish or a shark and state at least 3 reasons for your decision.

Next to each player, you will be able to see a HUD(Heads-up Display) a tool frequently used by poker players to visualize each player statistics.

Hints

Fishes (Losing players) profiling according to our findings:

- -Play more hands in general (bigger VPIP%)
- -Call more hands (bigger Call any preflop raise%)
- -Make more limps (bigger Limp%)
- -Are less agressive when playing (smaller 3 bet%)(smaller 4bet%)
- -Give up less versus agression when playing (smaller Fold to 3 bet %) (smaller Fold to 4 bet%)







The floor is open for questions!

