

# **Data Analysis and Visualization of My Chess.com Games**

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# Introduction

- This project is an analysis and visualization of my chess games played on Chess.com. The goal is to gain insights into various aspects of the games, including player performance, popular openings and game outcomes. The project involves data collection, parsing, analysis, and visualization.

# My Goals

- **Performance Assessment:** Evaluate my overall performance as a chess player by analyzing my win-loss-draw record and identifying areas of strength and improvement.
- **Opening Strategy Optimization:** Identify my most successful and unsuccessful openings when playing as both white and black, helping me refine my opening repertoire for future games.
- **Type of Win/Loss Analysis:** Categorize and analyze the types of wins, losses, and draws in my games to understand the common patterns and scenarios leading to different game outcomes.
- **Opponent Analysis:** Gain insights into my performance against specific opponents, including their playing styles and my success rate against them.
- **Visualization:** Create visual representations of my game data, such as pie charts, bar graphs and other plots to present my analysis findings in an easily understandable and visually appealing format.

# Data Collection

- The data for this project was collected from my Chess.com game archive in a PGN (Portable Game Notation) format.

# Data Parsing

- The collected data was parsed using Python scripts to extract relevant information, including game details (Event, Site, Date, Players, Result, etc.) and the sequence of moves.

# Parsed Data

|   | Event      | Site      | Date       | Round | White     | Black       | Result  | \ |
|---|------------|-----------|------------|-------|-----------|-------------|---------|---|
| 0 | Live Chess | Chess.com | 2023.02.08 | -     | adaylmazs | jonekone69  | 0-1     |   |
| 1 | Live Chess | Chess.com | 2023.02.08 | -     | adaylmazs | AceDuckling | 1/2-1/2 |   |
| 2 | Live Chess | Chess.com | 2023.02.08 | -     | Chrunches | adaylmazs   | 0-1     |   |
| 3 | Live Chess | Chess.com | 2023.02.08 | -     | M3rijnC   | adaylmazs   | 0-1     |   |
| 4 | Live Chess | Chess.com | 2023.02.08 | -     | Slim6284  | adaylmazs   | 0-1     |   |

|   | WhiteElo | BlackElo | TimeControl | EndTime      | \ |
|---|----------|----------|-------------|--------------|---|
| 0 | 594      | 763      | 600         | 13:07:28 PST |   |
| 1 | 595      | 596      | 600         | 13:30:03 PST |   |
| 2 | 563      | 688      | 600         | 13:44:04 PST |   |
| 3 | 702      | 771      | 600         | 13:55:10 PST |   |
| 4 | 785      | 839      | 600         | 14:14:55 PST |   |

|   | Termination                                   | \ |
|---|---|---|
| 0 | jonekone69 won on time                        |   |
| 1 | Game drawn - timeout vs insufficient material |   |
| 2 | adaylmazs won by checkmate                    |   |
| 3 | adaylmazs won by checkmate                    |   |
| 4 | adaylmazs won - game abandoned                |   |

|   | Moves   |
|---|---|
| 0 | 1. d4 1... d6 2. e4 2... Nf6 3. Bd3 3... g6 4.... |
| 1 | 1. e4 1... e5 2. Nc3 2... Qg5 3. Nf3 3... Qe7 ... |
| 2 | 1. d4 1... d5 2. Nf3 2... Nc6 3. Bg5 3... f6 4... |
| 3 | 1. e4 1... d5 2. Nc3 2... Nf6 3. Bb5+ 3... c6 ... |
| 4 | 1. e4 1... e5 2. Bc4 2... d6 3. Nf3 3... f6 4.... |

# Columns

- **"Event"**: The name or description of the event where the chess game was played.
- **"Site"**: The location or site where the game took place.
- **"Date"**: The date when the game was played.
- **"Round"**: The round or stage of the event in which the game occurred.
- **"White"**: The name of the player who played as White in the game.
- **"Black"**: The name of the player who played as Black in the game.
- **"Result"**: The result of the game (e.g., "1-0" for White's win, "0-1" for Black's win or "1/2-1/2" for a draw).
- **"WhiteElo"**: The Elo rating of the White player.
- **"BlackElo"**: The Elo rating of the Black player.
- **"TimeControl"**: The time control or time format used for the game (e.g., "180+2" for 3-minute blitz with 2 second increment).
- **"EndTime"**: The time at which the game ended.
- **"Termination"**: The reason for the game's termination (e.g., "Checkmate" or "Ran out of time").
- **"Moves"**: A string representing the sequence of moves made in the game.

# **Data Analysis and Visualization**



# What Is My Overall Win Rate?

- Total games: 2809
- Number of wins: 1482
- Overall win rate: 52.76%

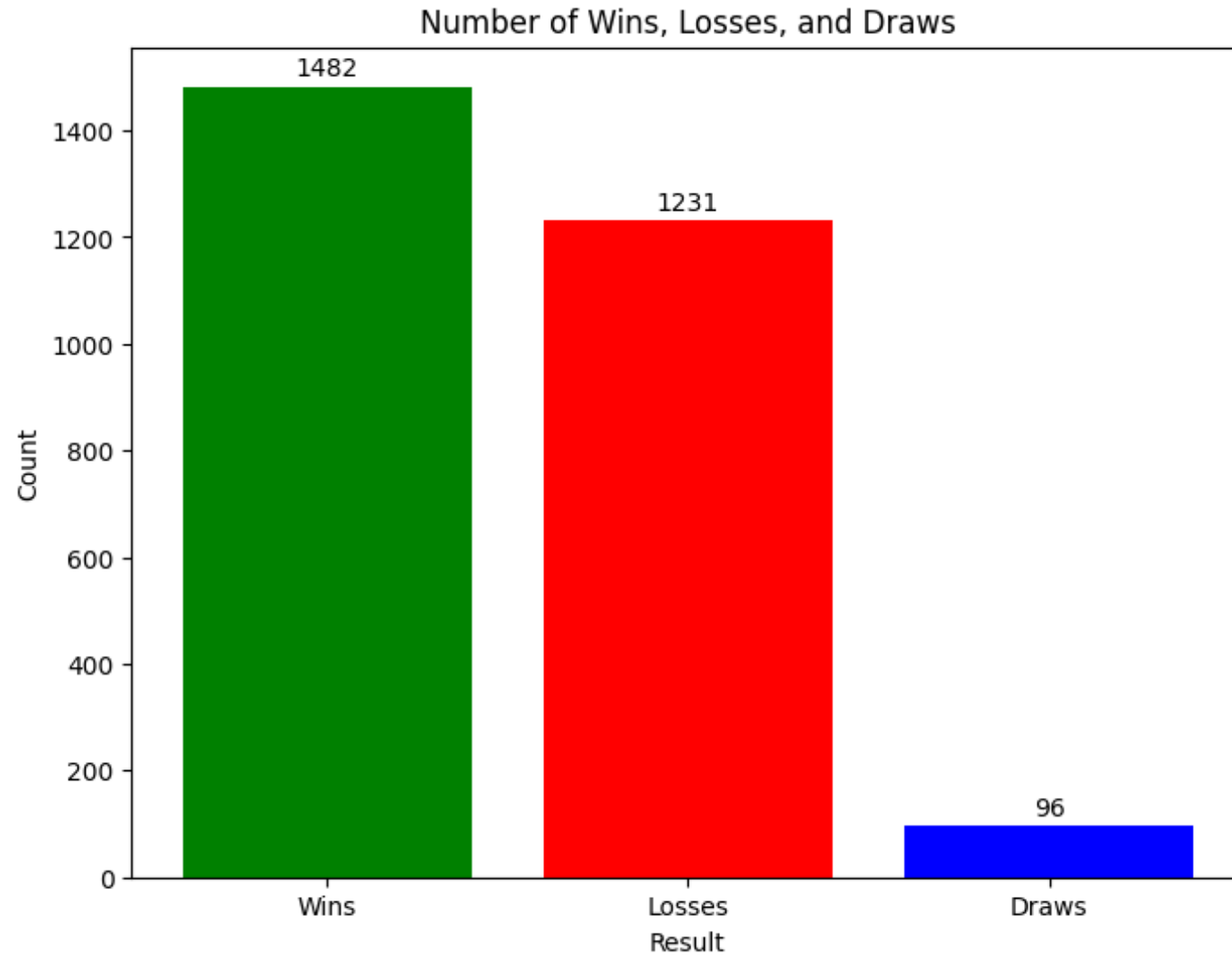
# How Many Games Have I Played In Modes Rapid, Blitz and Bullet?

- Rapid: 482 games
- Blitz: 1069 games
- Bullet: 1258 games

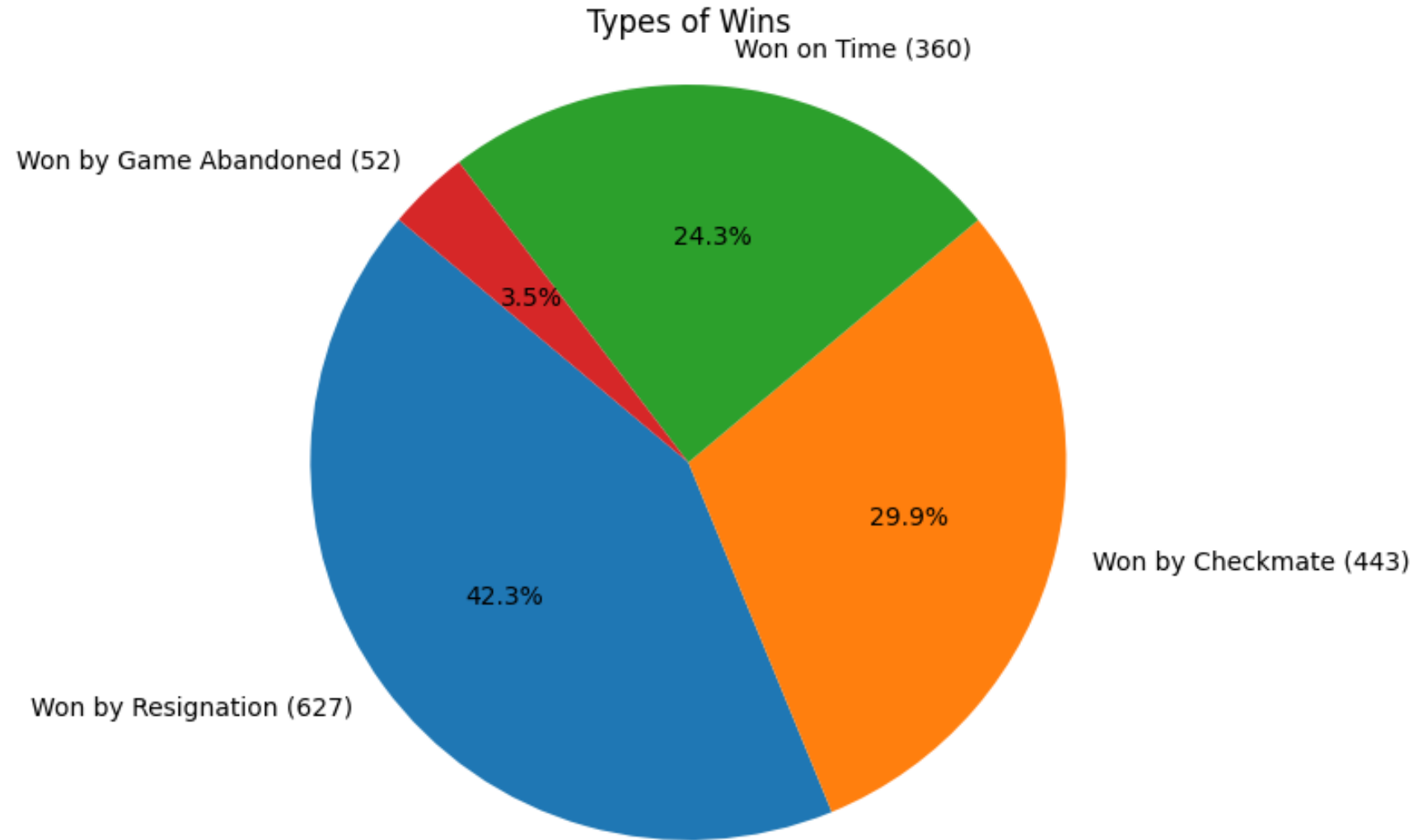
# What Is My Win Rate In Each Time Control?

- Win rate in Rapid: 59.13%
- Win rate in Blitz: 52.2%
- Win rate in Bullet: 50.79%

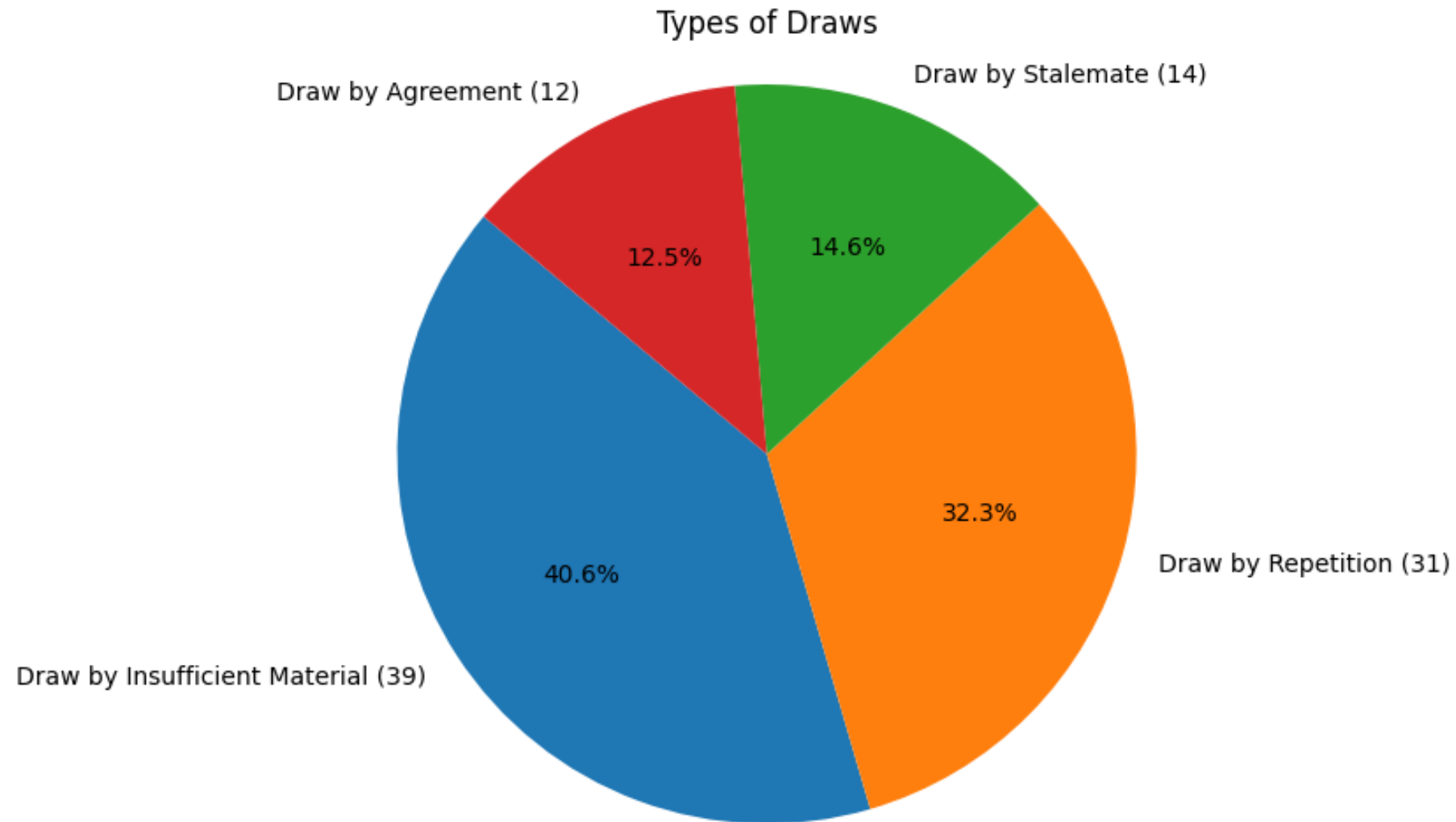
# Visualization of My Results



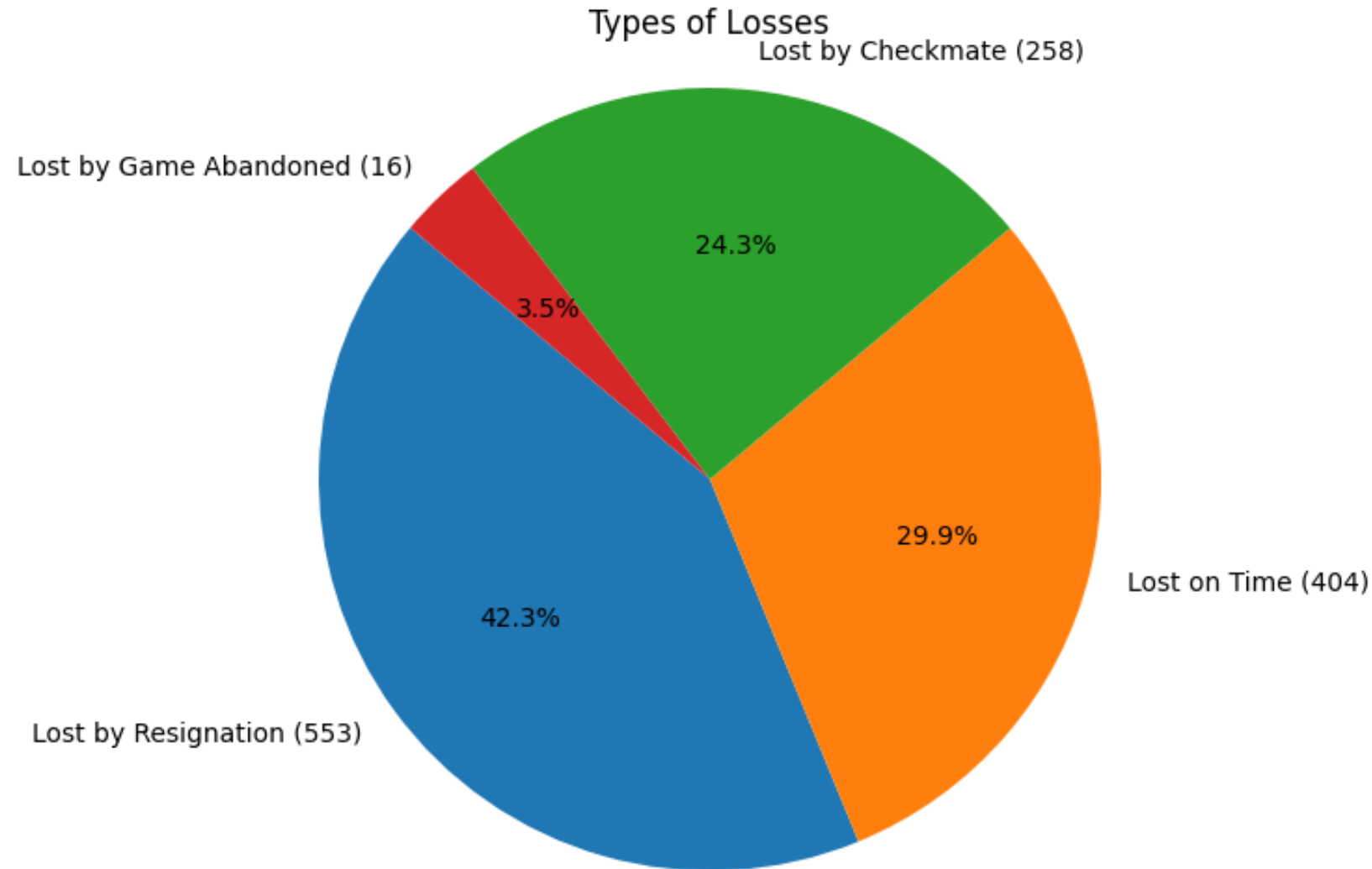
# How Did My Wins Occur?



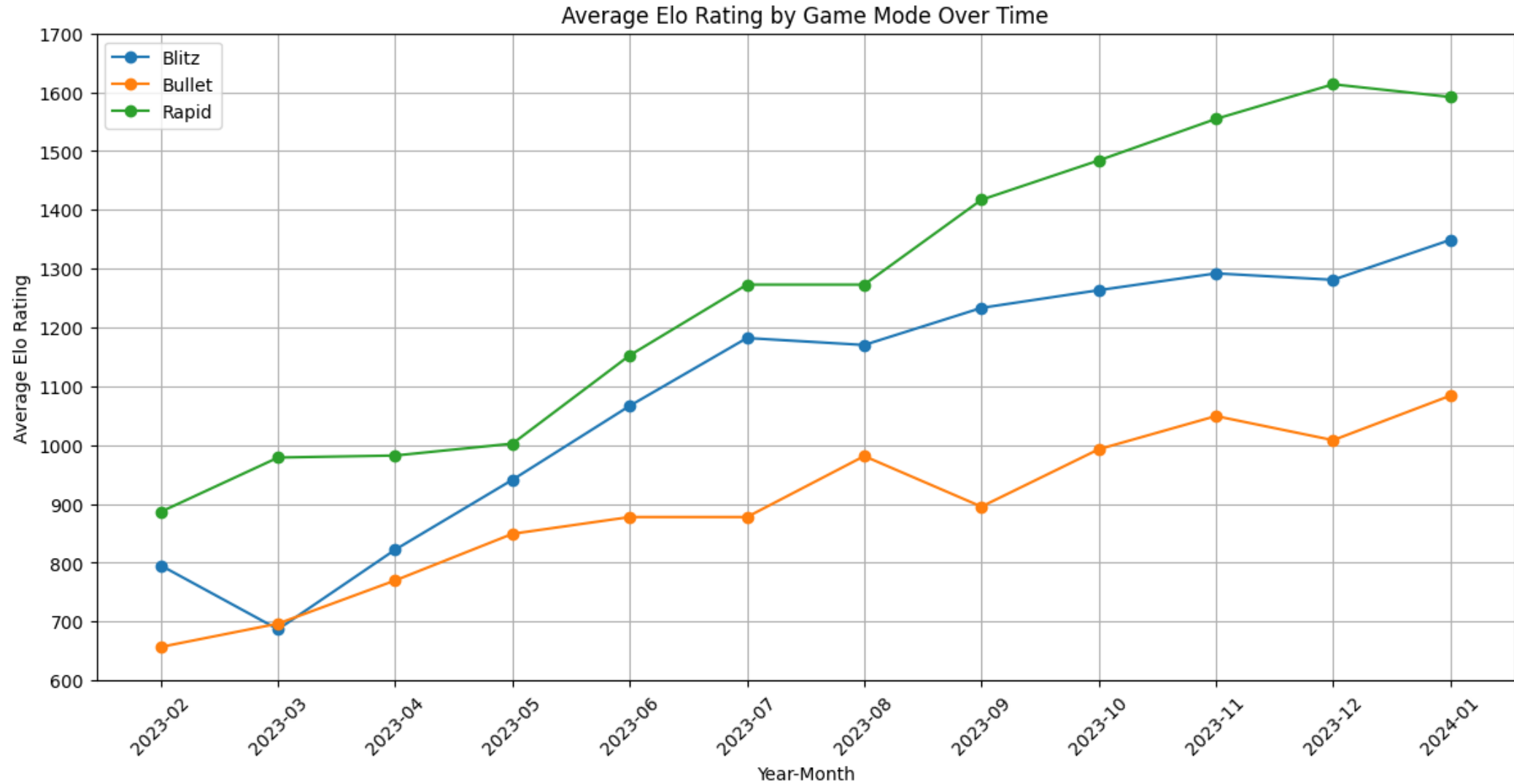
# How Did My Draws Occur?



# How Did My Losses Occur?



# My Average ELO for Each Game Mode by Month





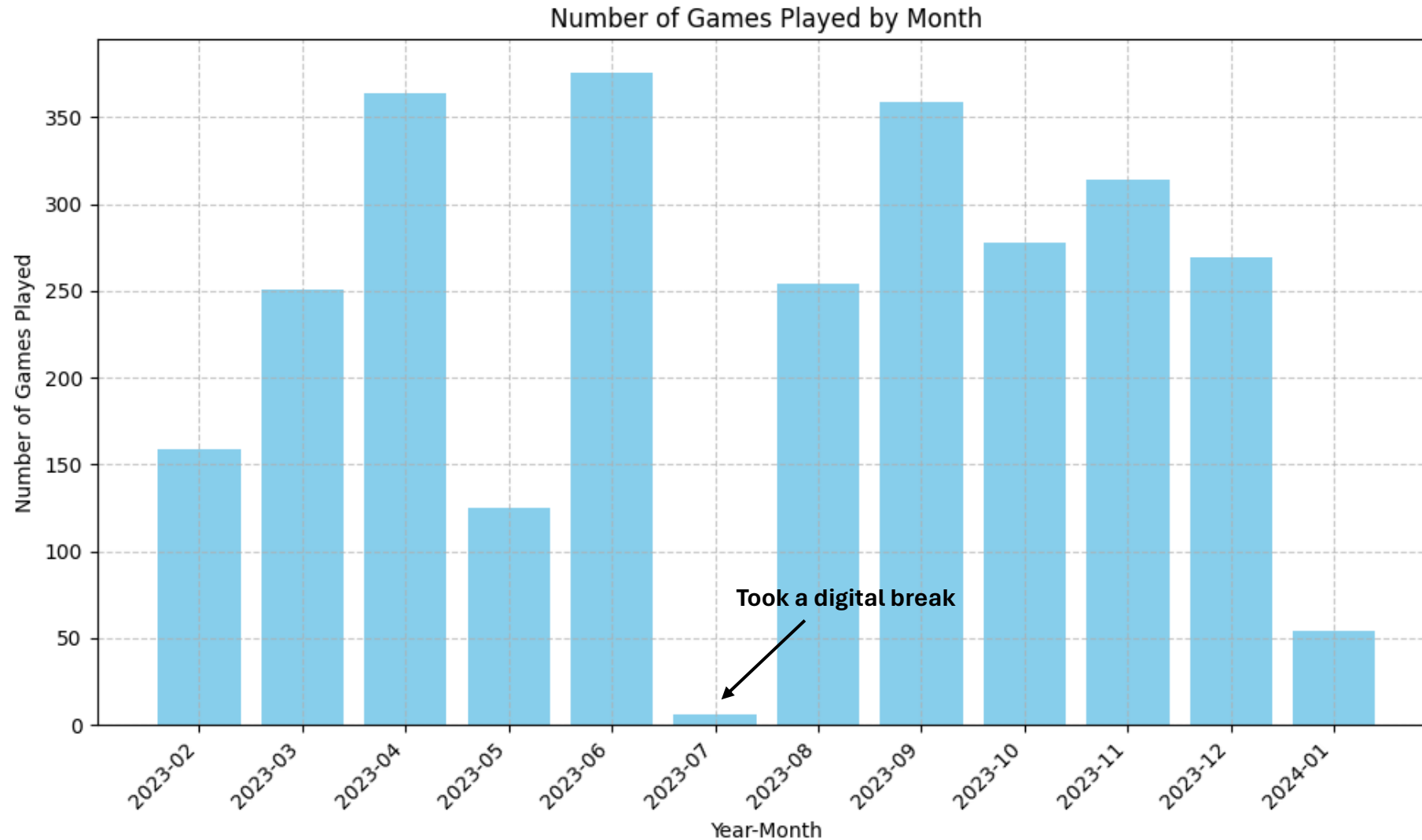
# What Is My Peak Rating For Each Time Control?

- Highest ELO in Rapid: 1633
- Highest ELO in Blitz: 1367
- Highest ELO in Bullet: 1129

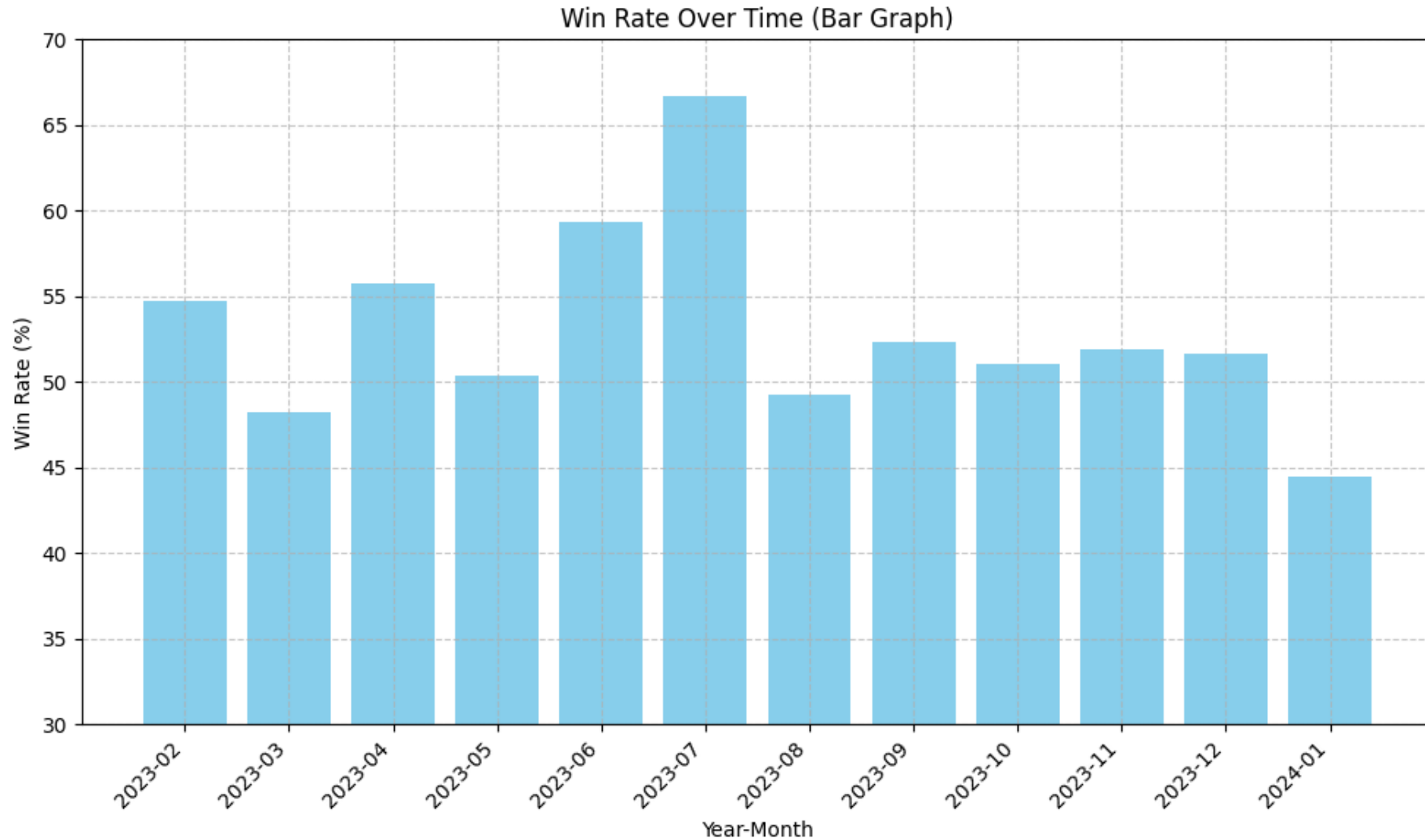
# How Many Games Did I Play As White or Black?

- Games played as White: 1403 (49.95%)
- Games played as Black: 1406 (50.05%)

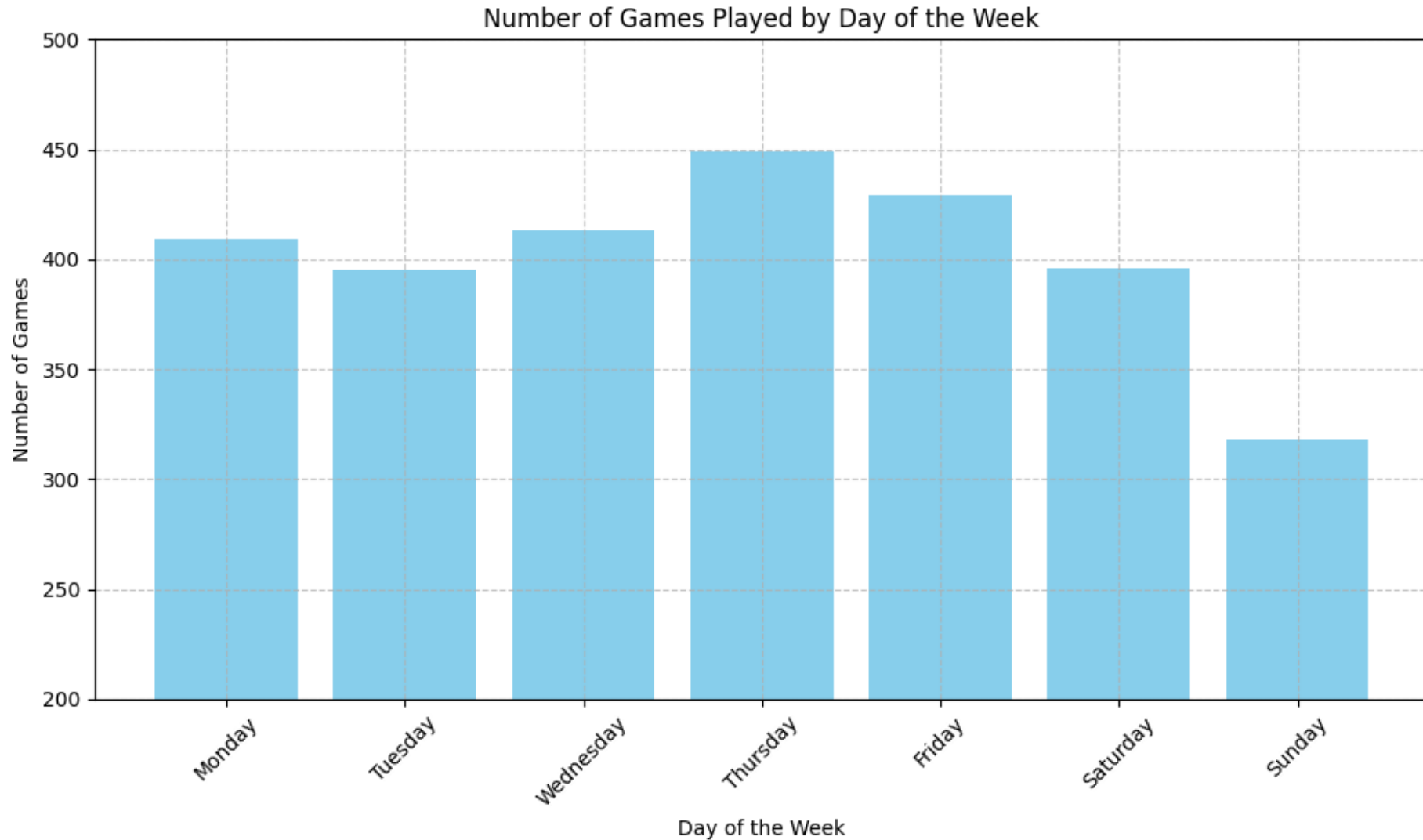
# Number of Games Played Each Month



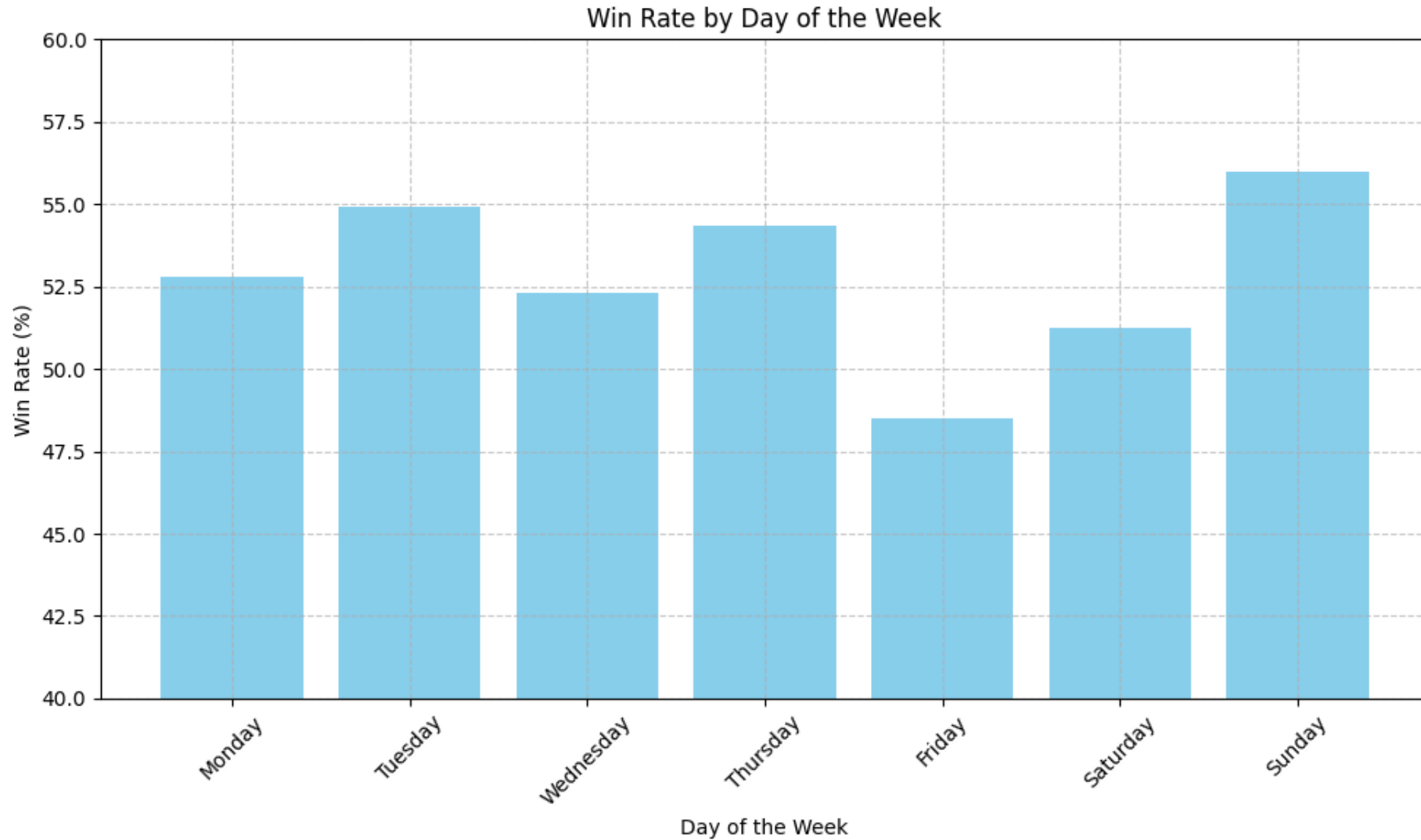
# What Was My Most Successful Month?



# Number of Games Played Each Day of the Week



# Which Day of the Week Is My Most Successful?



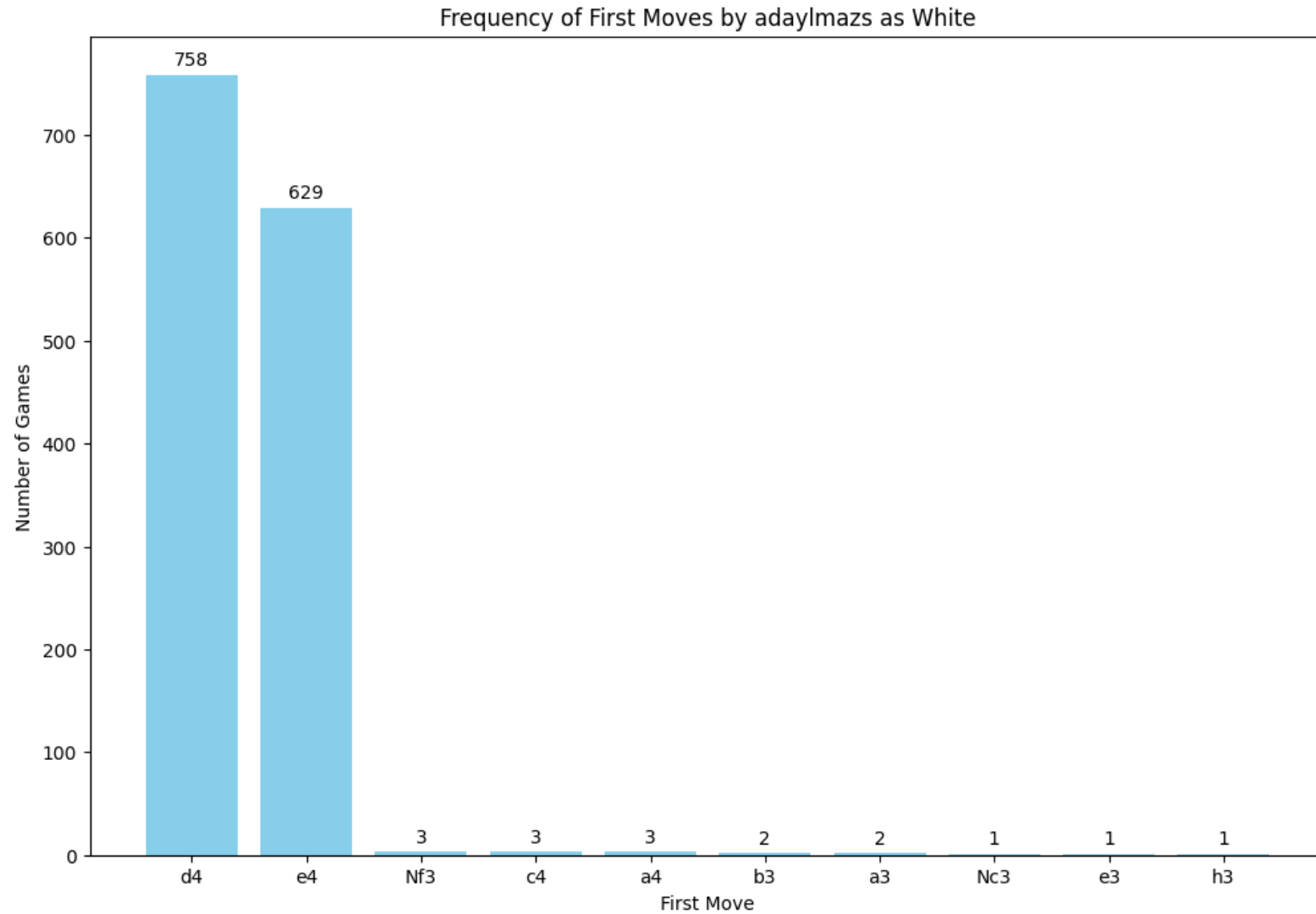
# **Deeper Dive into the Games**

# What Is the Average Number Of Moves In a Game?

- Average number of moves per game: 71.56



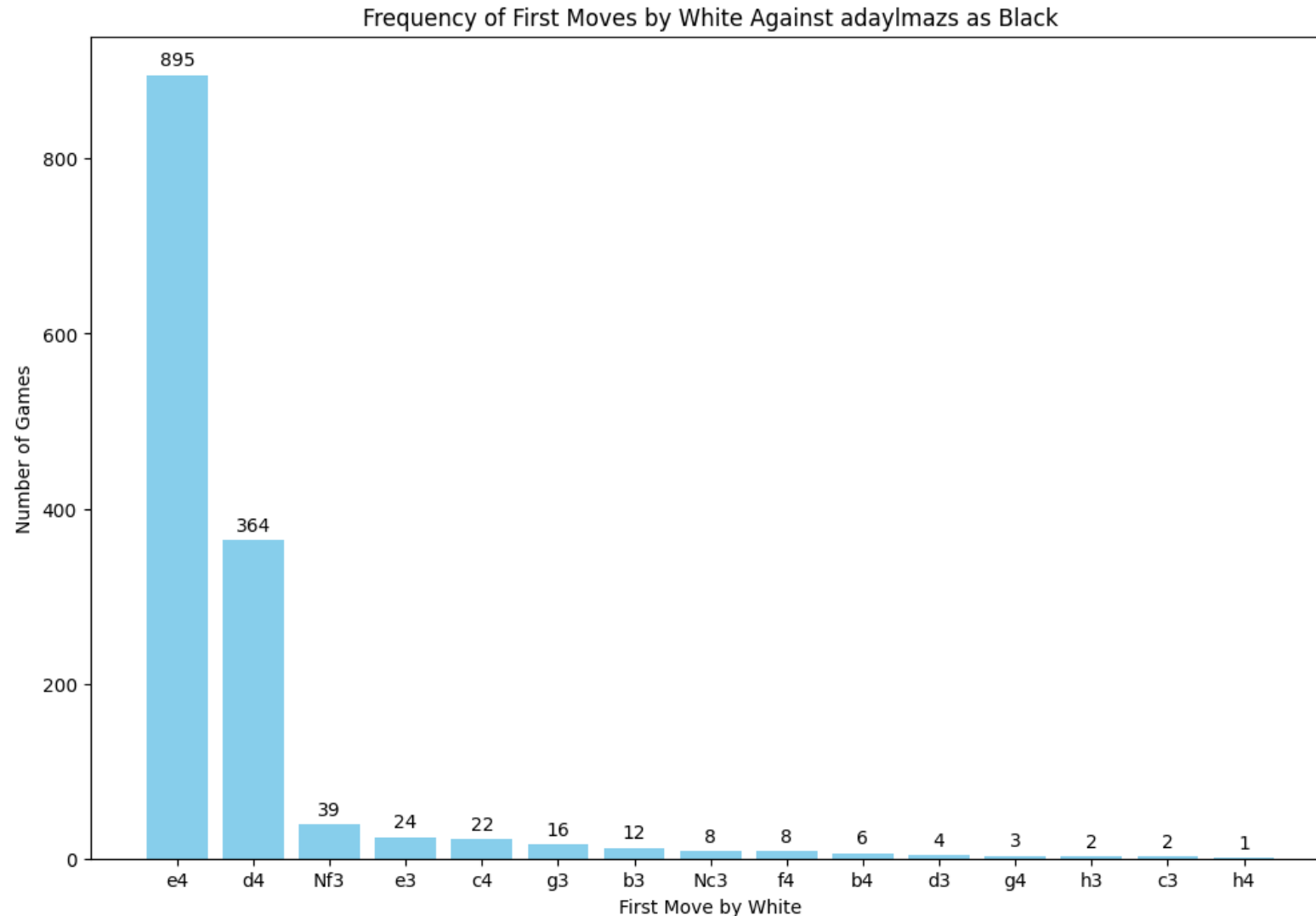
# What Are My First Moves as White?



# 1.e4 or 1.d4?

- My win rate as white with 1.e4: 51.35%
- My win rate as white with 1.d4: 53.83%

# What Are The First Moves Against Me When I Am Playing As Black?



# 1.e4 or 1.d4 Against Me?

- My win rate as black against 1.e4: 55.42%
- My win rate as black against 1.d4: 47.53%

# Which Openings I Play / Encounter Most Often As White?

(At least 20 times)

- Other Openings: 418 times
- London System: 222 times
- Ruy Lopez: 181 times
- Accelerated London System: 136 times
- Sicilian Defense: 107 times
- Caro-Kann Defense: 95 times
- Scandinavian Defense: 53 times
- French Defense: 49 times
- Pirc Defense: 26 times
- Philidor Defense: 22 times
- Petrov Defense: 20 times

# Which Openings Am I Most Successful With/ Against As White?

- Opening: Petrov Defense, Winrate: 70.00%
- Opening: London System, Winrate: 58.11%
- Opening: Sicilian Defense, Winrate: 57.94%
- Opening: Pirc Defense, Winrate: 57.69%
- Opening: Accelerated London System, Winrate: 55.15%
- Opening: Ruy Lopez, Winrate: 52.49%
- Opening: Other, Winrate: 50.24%
- Opening: Philidor Defense, Winrate: 50.00%
- Opening: Scandinavian Defense, Winrate: 49.06%
- Opening: French Defense, Winrate: 46.94%
- Opening: Caro-Kann Defense, Winrate: 43.16%

# Which Openings I Play / Encounter Most Often As Black?

(At least 20 times)

- Caro-Kann Defense: 678 times
- Other Openings: 307 times
- Queen's Gambit: 84 times
- Accelerated London System: 74 times
- Italian Game: 48 times
- Reti Opening: 39 times
- London System: 34 times
- English Opening: 22 times
- Scandinavian Defense: 21 times

# Which Openings Am I Most Successful With/ Against As Black?

- Opening: Reti Opening, Winrate: 64.10%
- Opening: Scandinavian Defense, Winrate: 61.90%
- Opening: Italian Game, Winrate: 58.33%
- Opening: Caro-Kann Defense, Winrate: 55.75%
- Opening: Other, Winrate: 53.42%
- Opening: London System, Winrate: 50.00%
- Opening: Accelerated London System, Winrate: 47.30%
- Opening: Queen's Gambit, Winrate: 40.48%
- Opening: English Opening, Winrate: 27.27%



# Conclusions

# Performance Statistics

- I have a substantially higher win rate in Rapid chess compared to Blitz and Bullet.
- Compared to my opponents, I win by checkmate more often and lose on time more frequently.
- The number of games I play significantly decreases during months when I have my finals.
- June and July 2023 were my most successful months, while January 2024 is currently my worst month.
- I've only had 3 months with a win rate under 50%, including the current month of January 2024.

# Playing Habits

- I play the least on Sundays by a significant margin.
- I play the most on Thursdays, but the margin is relatively small.
- Sunday is the best day of the week for my chess with over a 55% win rate, while Friday is the worst day, being the only day with a win rate below 50%.

# Gameplay Details

- The average game I play has a total of 71 moves.
- I play both 1.e4 (629 times) and 1.d4(758 times).
- When playing as White, I have the win rate of 51.3% with 1.e4 and 53.8% with 1.d4.
- Against me when I'm playing Black, 1.e4 is more popular (895 times) than 1.d4 (364 times).
- I have more success against 1.e4 (55.4% win rate) compared to 1.d4 (47.5% win rate) when playing as Black.

# Openings As White

- When playing as White, I have played the London System (222 games), Ruy Lopez (181 games), and the Accelerated London System (136 games) the most.
- When playing as White, I have played against the Sicilian Defense (107 games), Caro-Kann (95 games), Scandinavian Defense (53 games), and French Defense (49 games) the most.
- I have the highest success rate when playing the London System (58.1% win rate), Accelerated London System (55.1%), and Ruy Lopez (52.5%) as White.
- I have the highest success rate when playing against the Petrov Defense (70.0% win rate), Sicilian Defense (57.9% win rate) and Pirc Defense (57.7%) as White.
- I struggle the most against the Caro-Kann Defense (43.1% win rate) and the French Defense (46.9%) when playing as White.

# Openings as Black

- When playing as Black, I have played the Caro-Kann Defense (678 games) the most.
- When playing as Black, I have played against the Queen's Gambit (84 games) and Accelerated London (74 games) the most.
- I have the highest success rate when playing the Scandinavian Defense (61.9% win rate) and Caro-Kann Defense (55.7%) as Black.
- I have the highest success rate when playing against the Reti Opening (64.1% win rate) and Italian Game (58.3%) as Black.
- I struggle the most against the English Opening (27.2% win rate) and Queen's Gambit (40.5% win rate) when playing as Black.

# **Future Enhancements**

# Future enhancements for this project may include:

- Real-time data updates using the Chess.com API.
- Additional statistical analysis and machine learning to predict game outcomes.
- Enhanced interactive visualizations for exploring individual games.
- Integration with a web application for greater accessibility.