



# How 2.b.a Master!

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# Problem Statement

Which Pokemon type tends to win the most 1-on-1 battles?

Which Pokemon stat is the best indicator of a Pokemon's likeliness to win a battle?

How important is making smart move choices when battling Pokemon?



# Background

- Close connection to the Pokemon games
- Results could make it easier for new players and competitive players alike to make viable teams



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# Data Set Description

2 CSV files from [Complete Competitive Pokemon Dataset | Kaggle](#):  
Pokemon dataset contains Pokemon names, stats, abilities, moves, generation

Move dataset contains move names, stats, competitive contest, generation  
Data recorded up to 7th generation of Pokemon (2016)

Data scraped from [Pokemon | SM | Smogon Strategy Pokedex](#) and [List of moves - Bulbapedia, the community-driven Pokémon encyclopedia \(bulbagarden.net\)](#)



# Important Data Points

Pokemon stats to look at: Name, Type, Health, Attack, Defense, Special Attack, Special Defense, Speed (All play a factor into how much damage is done), and Move list

Move stats to look at: Name, Type, Category, Power

For battle simplification, we decided to ignore PP (how much a move can be used), Accuracy, and healing items. Pokemon can only use 4 moves.





# How are Pokemon Moves Chosen?

- 1) Pokemon must have at least one Physical and one Special move
- 2) Pokemon must have at least one move that is a different type from the others
- 3) Pokemon will choose the strongest move (move with the most power) when they can



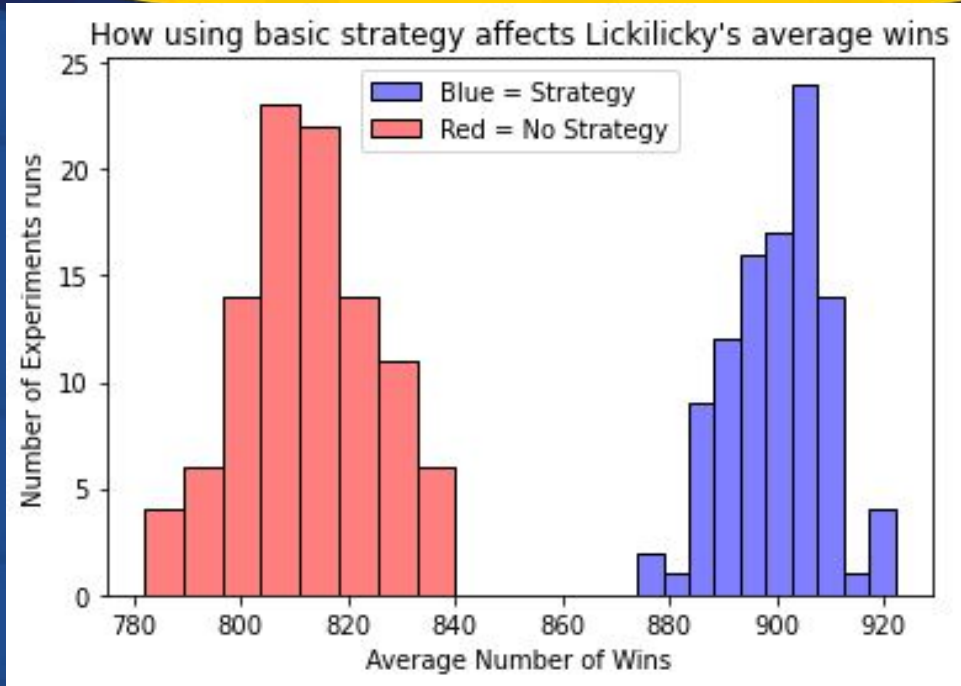
# Battle Setup

- Pokemon with the higher speed moves first
- Each Pokemon automatically chooses the move that will do the most damage
- Repeat until a Pokemon faints and a winner is declared!

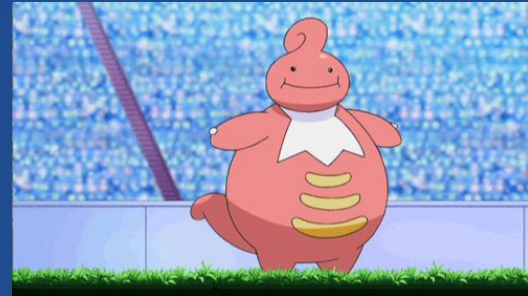


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# Random VS “Smart” Strategy



- Monte Carlo Simulation
- Use of strategy makes clear improvements



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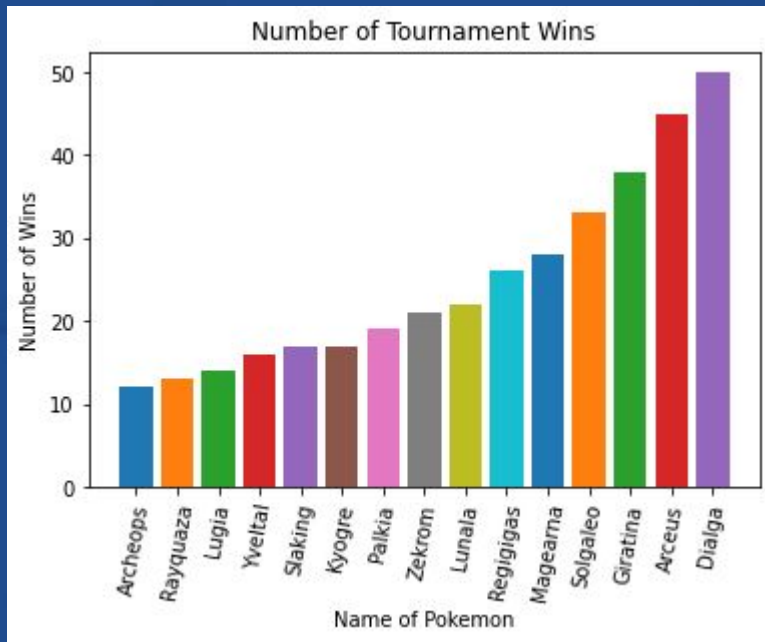


# Tournament Setup

- Simulates a Tournament between all Pokemon in the data set
- Pairs up randomized pokemon for battles
- Runs many times in order to find the commonalities between the winners



# Strongest Pokemon



Dialga: Steel/Dragon



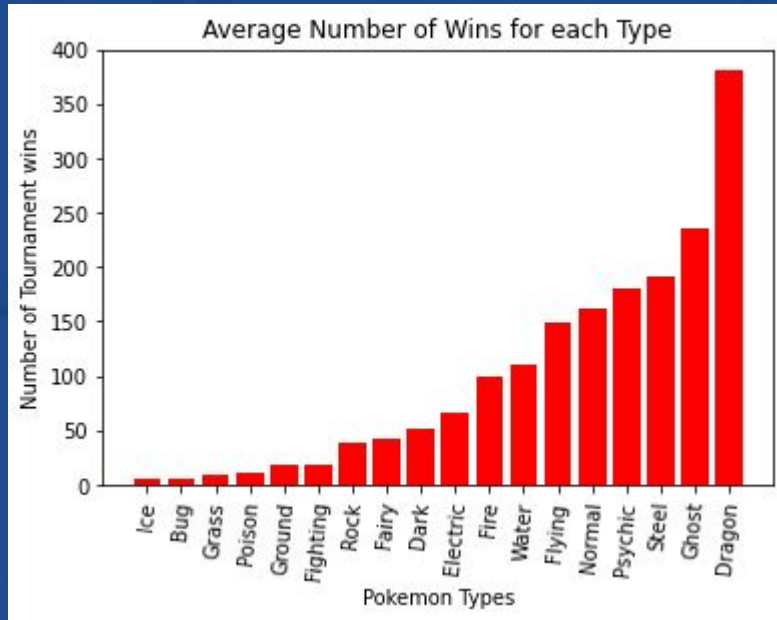
Arceus: Normal



Giratina: Ghost/Dragon

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# Pokemon Type Chart



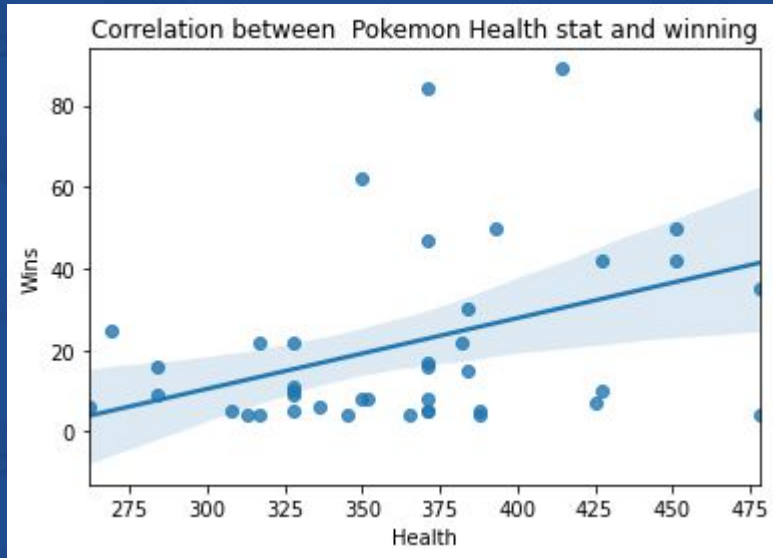
Dragon, Ghost, and Steel types generally win more tournaments compared to other Pokemon types. This may be because these Pokemon types have strong resistances and even immunities to popular move types, such as Normal moves.

On the flip side, Ice, Bug, and Grass type Pokemon win the least amount of tournaments.

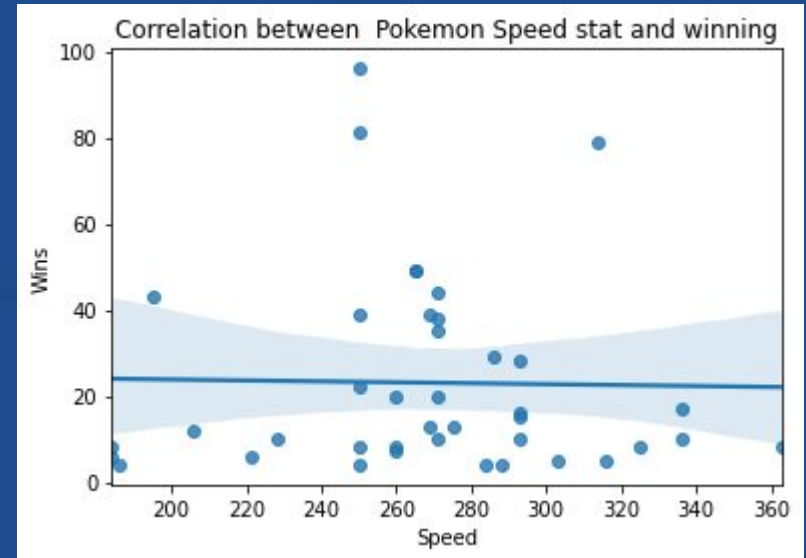


# Health and Speed Lin Reg

Correlation: -0.0196



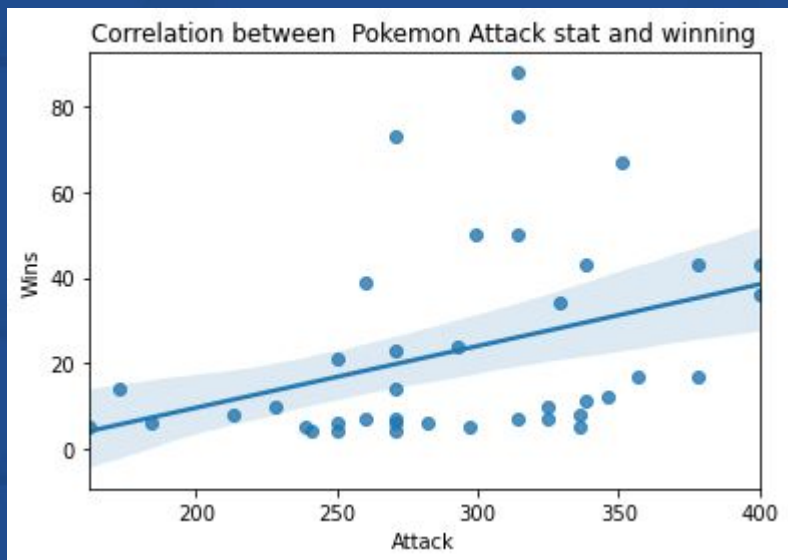
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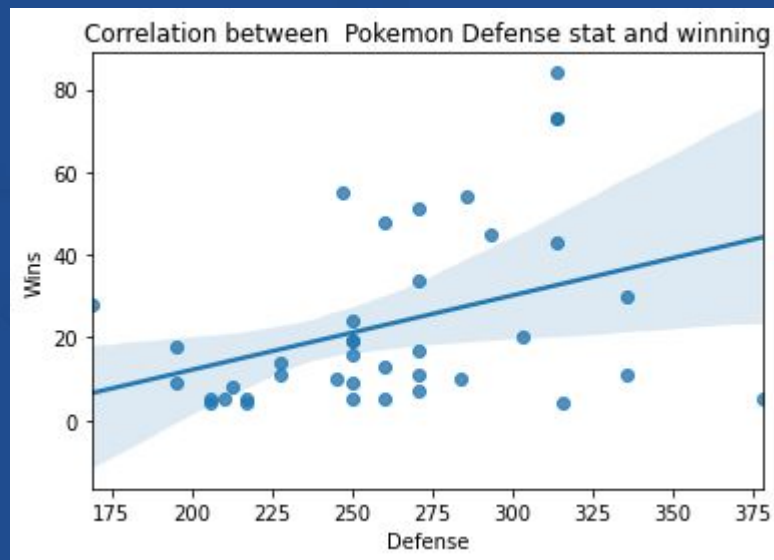
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# Attack and Defense Lin Reg

Correlation: 0.3752



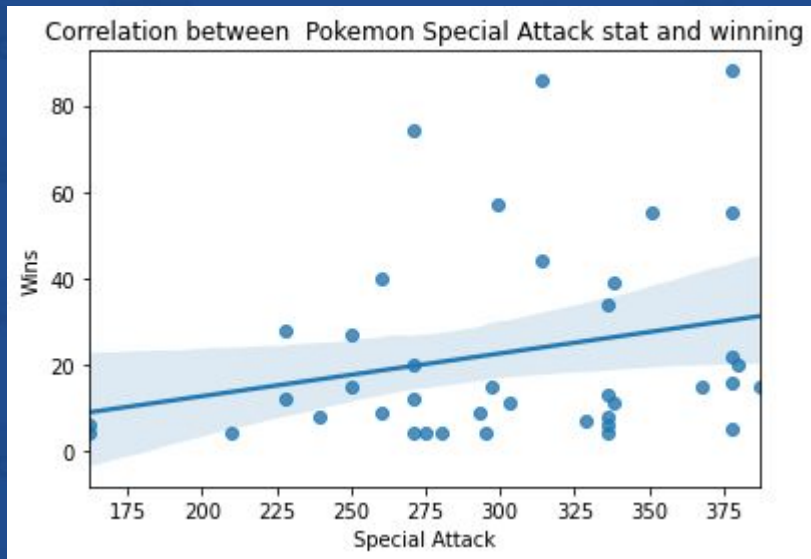
Correlation: 0.3629



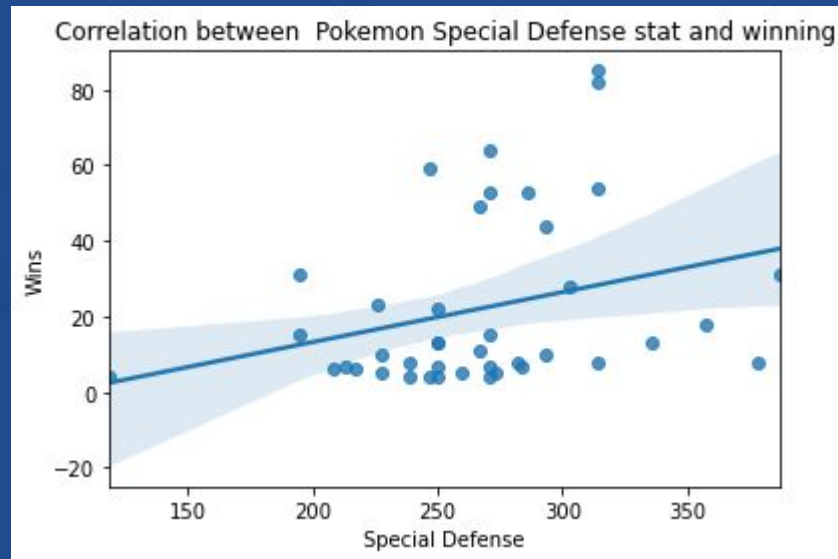


# Special Attack and Special Defense Lin Reg

Correlation: 0.2948



Correlation: 0.2530



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# Conclusion

- Most important Stats:
  - Health
  - Defense
  - Attack
- Best Types:
  - Dragon
  - Psychic
  - Steel
- Least important Stats:
  - Speed
  - Spe. Attack
  - Spe. Defense
- Worst Types:
  - Ice
  - Bug
  - Grass



# Drawbacks / Future Work

- Elements of battle not included:
  - Status and healing moves
  - Move accuracy and PP
  - Weather effects
  - Status effects
  - Items
  - Pokemon abilities

Nevertheless, this can help competitors choose which Pokemon would likely win based on stats and types. In addition, this can inform developers on which pokemon types tend to win battles disproportionately for balancing.



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**Thank You!**



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