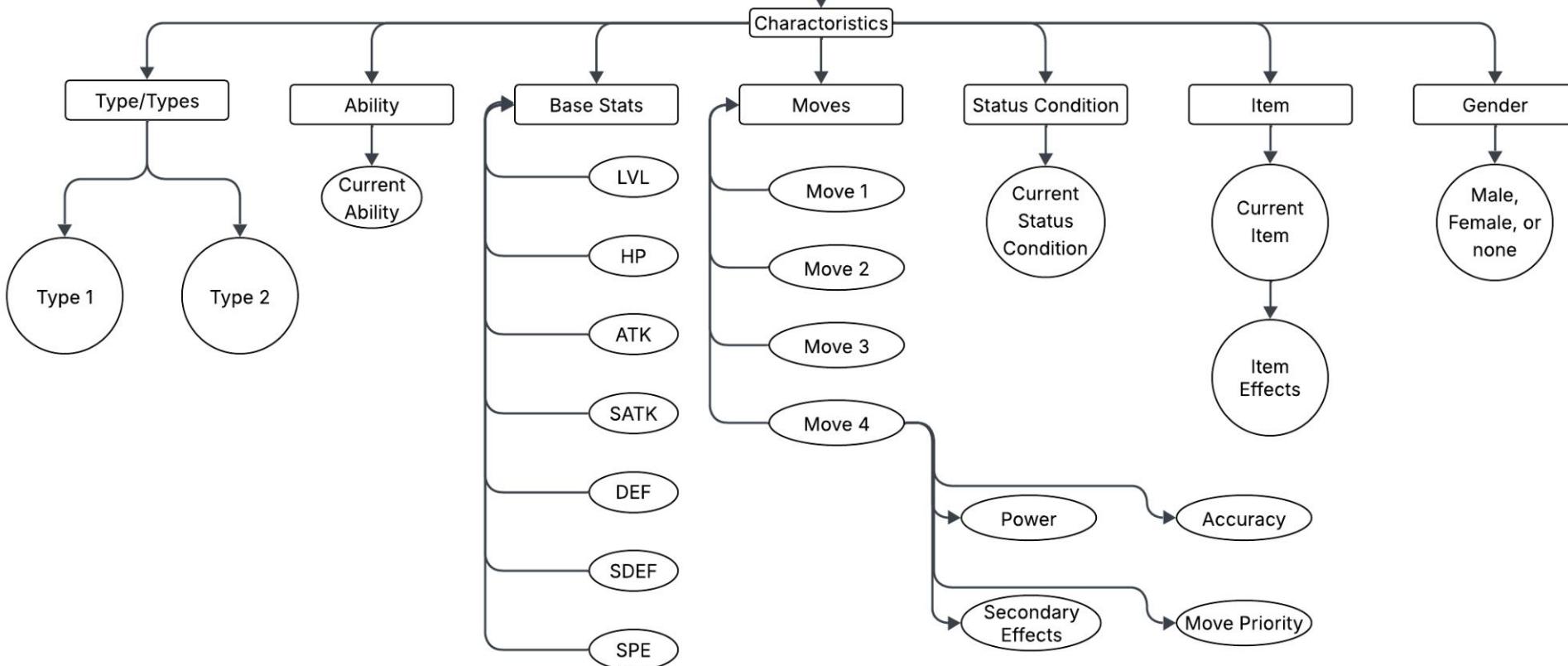




# ADVANCED POKÉMON BATTLE SIMULATOR

By: William Pitts and Caleb Oglesby

# WHAT MAKES A POKÉMON A POKÉMON?



# IMPORTANT POKÉMON CHARACTERISTICS

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1. Types
  1. Type 1: Fire
  2. Type 2: Null
2. Ability
  1. Can increase stat's
  2. Alter moves
  3. Alter Pokémon type
  4. Etc.
3. Stats
4. Moves
  1. 4 per Pokémon
  2. Setup, recovery, and attacking moves
5. Status Condition
  1. Is it burned, poised, asleep, frozen, paralyzed
    1. Some of these have effects besides their primary effect.
6. Item
  1. Works like a second ability if held like Pokémon
7. Gender
  1. Only matter is the move "Attract" is used



Item: Silk scarf increases  
normal type move attack  
power

# Pokémon Type Chart

created by pokemondb.net

Applies to all games since Pokémon X&Y (2013)

# TYPE AND DAMAGE INFO

Pokémon can have up to two types, and their effectiveness multipliers are affected by one another. If a Pokémon is a Grass and Ice type, then a Fire attacking move is 4 times effective against it.

## Other Factors to Damage:

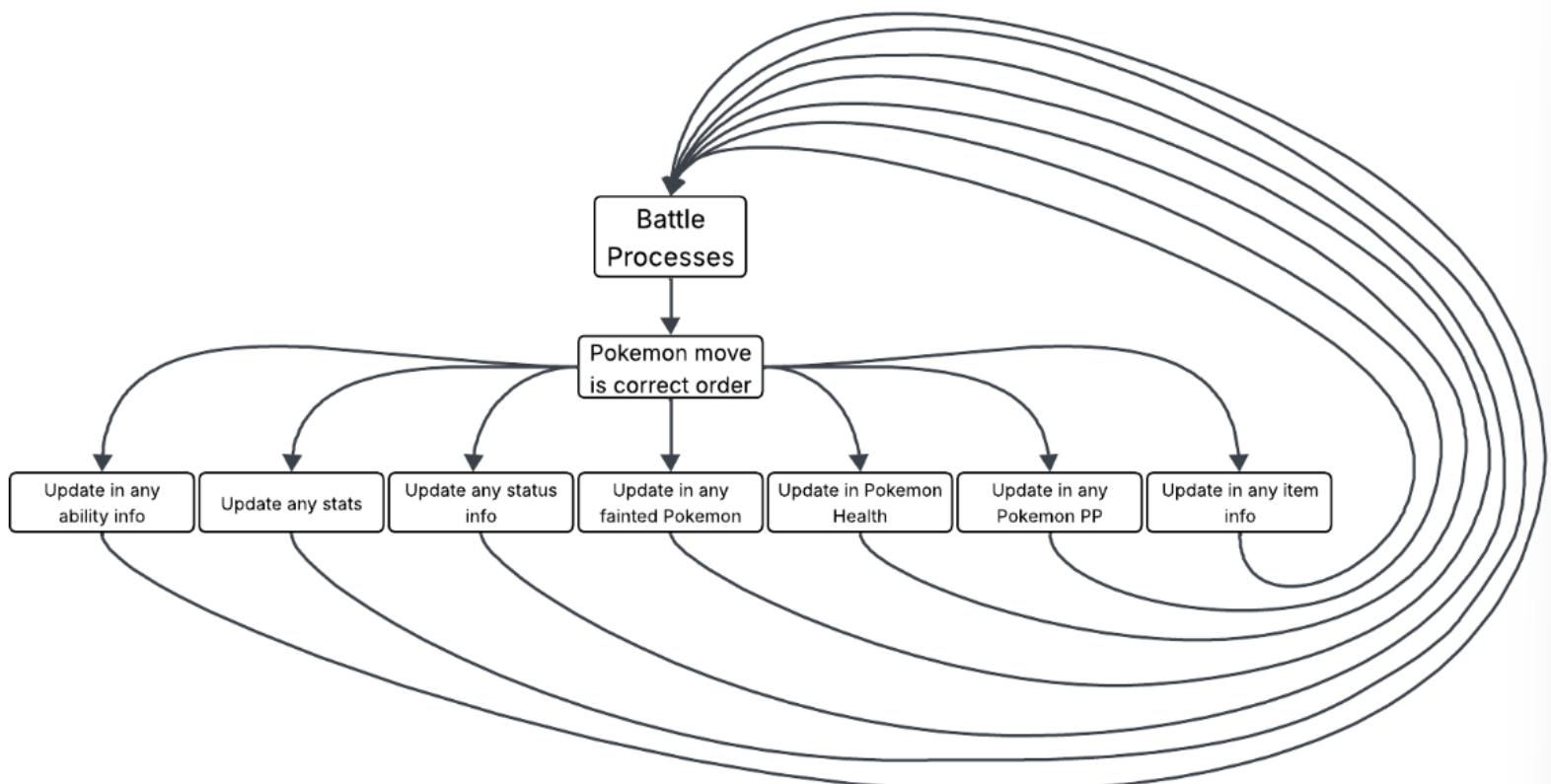
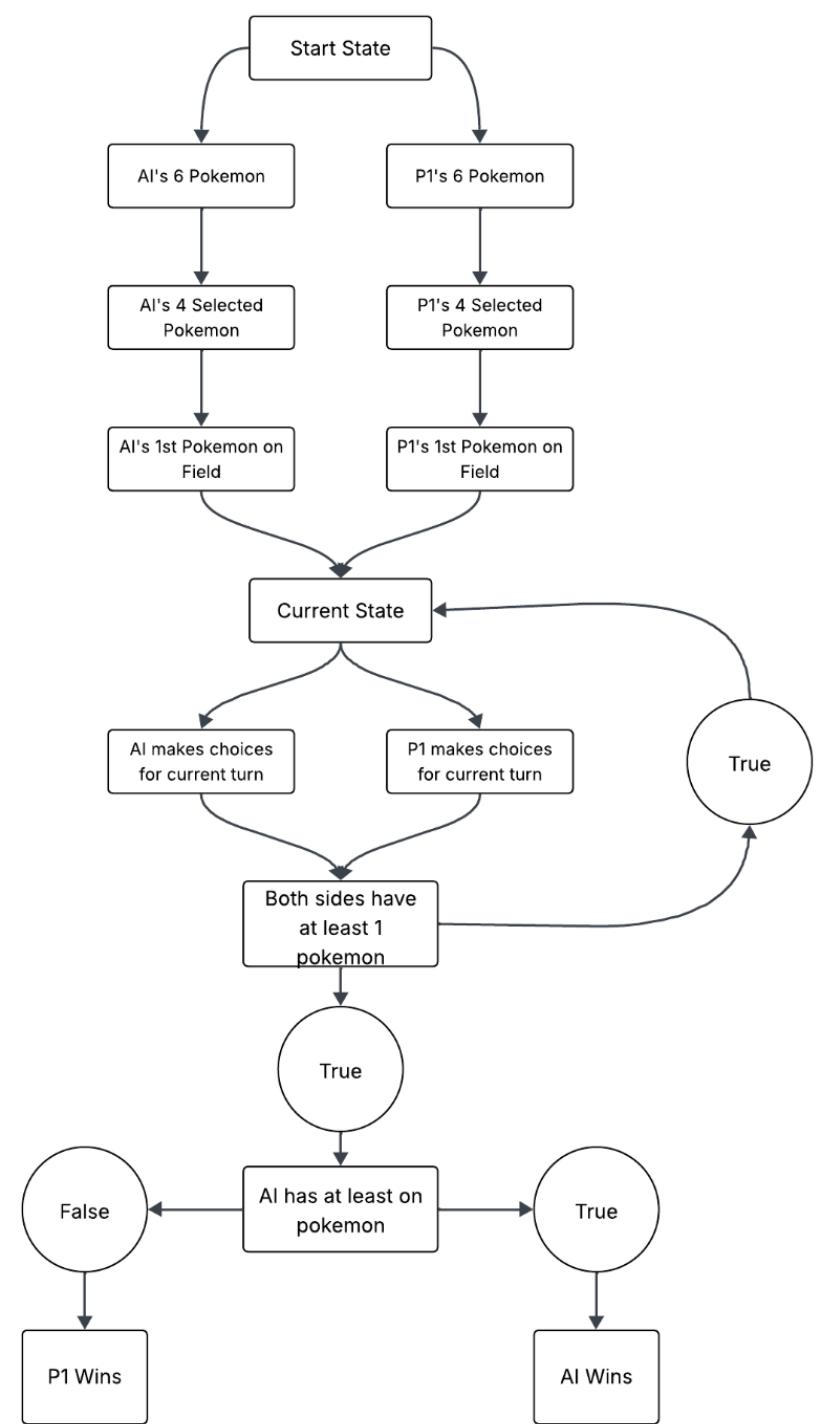
- Item Effects
- Ability Effects
- Etc.

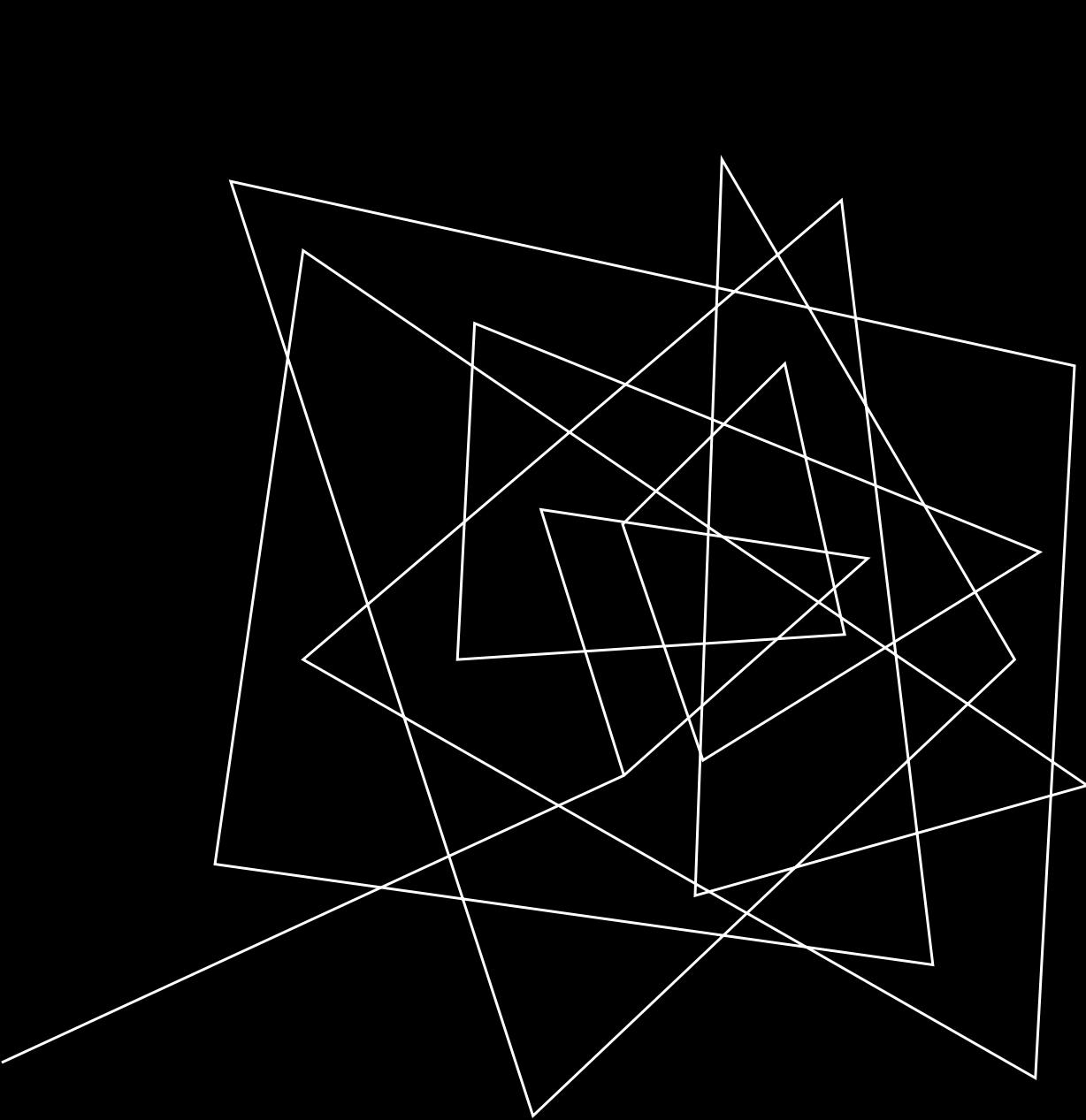


	NOR	FIR	WAT	ELE	GRA	ICE	FIG	POI	GRO	FLY	PSY	BUG	ROC	GHO	DRA	DAR	STE	FAI	
NORMAL	0	½	No effect (0%)	½	Normal (100%)	2	Super-effective (200%)	½	0	½	Normal (100%)	2	Super-effective (200%)	½	0	½	½	½	
FIRE	½	½	No effect (0%)	2	Normal (100%)	2	Super-effective (200%)	½	0	½	Normal (100%)	2	Super-effective (200%)	½	0	½	2	2	
WATER	2	½	No effect (0%)	½	Normal (100%)	2	Super-effective (200%)	2	0	2	Normal (100%)	2	Super-effective (200%)	½	0	½	½	½	
ELECTRIC	2	½	½	½	Normal (100%)	2	Super-effective (200%)	0	2	Normal (100%)	2	Super-effective (200%)	½	0	½	½	½	½	
GRASS	½	2	No effect (0%)	½	Normal (100%)	2	Super-effective (200%)	½	2	½	Normal (100%)	2	Super-effective (200%)	½	0	½	½	½	
ICE	½	½	No effect (0%)	2	Normal (100%)	2	Super-effective (200%)	2	2	Normal (100%)	2	Super-effective (200%)	2	0	2	½	½	½	
FIGHTING	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	½	½	½	2	0	2	2	2	½	
POISON	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	½	Normal (100%)	2	Normal (100%)	2	0	2	0	2	2	
GROUND	2	Normal (100%)	2	Normal (100%)	½	Normal (100%)	2	Normal (100%)	2	0	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	
FLYING	Normal (100%)	½	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	Normal (100%)	½	
PSYCHIC	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	
BUG	½	Normal (100%)	2	Normal (100%)	½	Normal (100%)	½	Normal (100%)	½	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	Normal (100%)	2	Normal (100%)	½
ROCK	2	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	
GHOST	0	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	
DRAGON	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	
DARK	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	
STEEL	½	½	½	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	Normal (100%)	2	Normal (100%)	2	Normal (100%)	2	Normal (100%)	½	Normal (100%)	2
FAIRY	½	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	Normal (100%)	

$$Damage = \left( \left( \frac{\left( \frac{2 \times Level}{5} + 2 \right) \times Power \times \frac{A}{D}}{50} + 2 \right) \times Targets \times PB \times Weather \times GlaiveRush \times Critical \times random \times STAB \times Type \times Burn \times other \times ZMove \times TeraShield \right)$$

# HOW DOES A SINGLES POKEMON BATTLE WORK



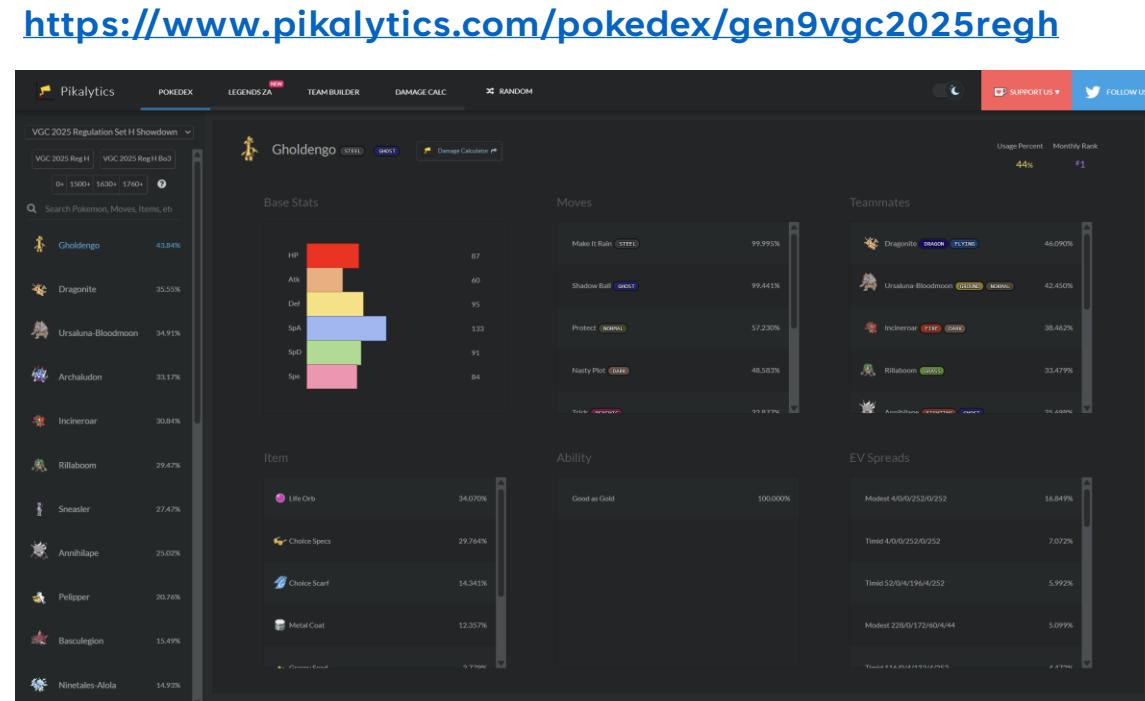


# DATA LOADING AND PROCESSING

# PIKALYTIC.COM

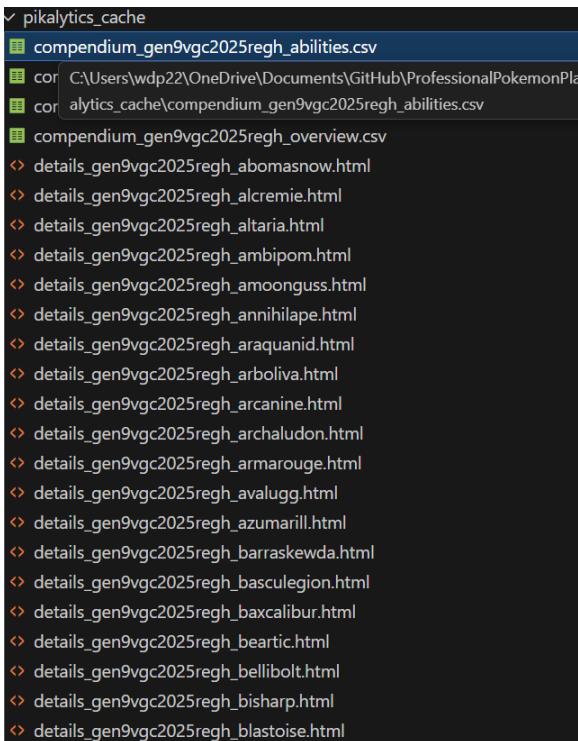
## How we used this website

1. We scanned all HTML for every Pokémon page by using two files (generate\_pikalytics\_compendium.py and pikalytics.util.py):
  - a. Adding /Pokémon\_Name to "<https://www.pikalytics.com/pokedex/gen9vgc2025regh>"
2. It would then generate separate HTML files for each Pokémon
3. These files would later be used to as the source of important data like what percentage of time a Pokémon is used Competitively, what moves it uses, etc.
4. That is done by our Data loader script.



# DATA LOADER

1. Data Loader read several important csv files using pandas so it can better parse through the HTML files.
2. It has key words that it will look for within the HTML
3. Data Loader enables Team Builder AI Battler to function using the algorithm we designed, while also making Team Builder GUI for the Player More understandable and helpful for a competitive team builder.
4. Pikalytics files and Data Loader scripts are the most important and unique files we made.



Build Your Team

Type: All types

Your Team (max 4)

Abomasnow  
Altaria  
Amoonguss  
Annihilape  
Araquanid  
Arboliva  
Arcanine  
Armarouge  
Azumarill  
Barraskewda  
**Baxcalibur**  
Beartic

Add Remove Clear

Moves

Available moves

Selected moves (max 4)

Protect (88.3%)  
Ice Shard (81.9%)  
Icicle Spear (77.3%)  
Scale Shot (69.0%)  
Glaive Rush (29.3%)  
Icicle Crash (15.8%)  
Earthquake (12.5%)  
High Horsepower (10.4%)

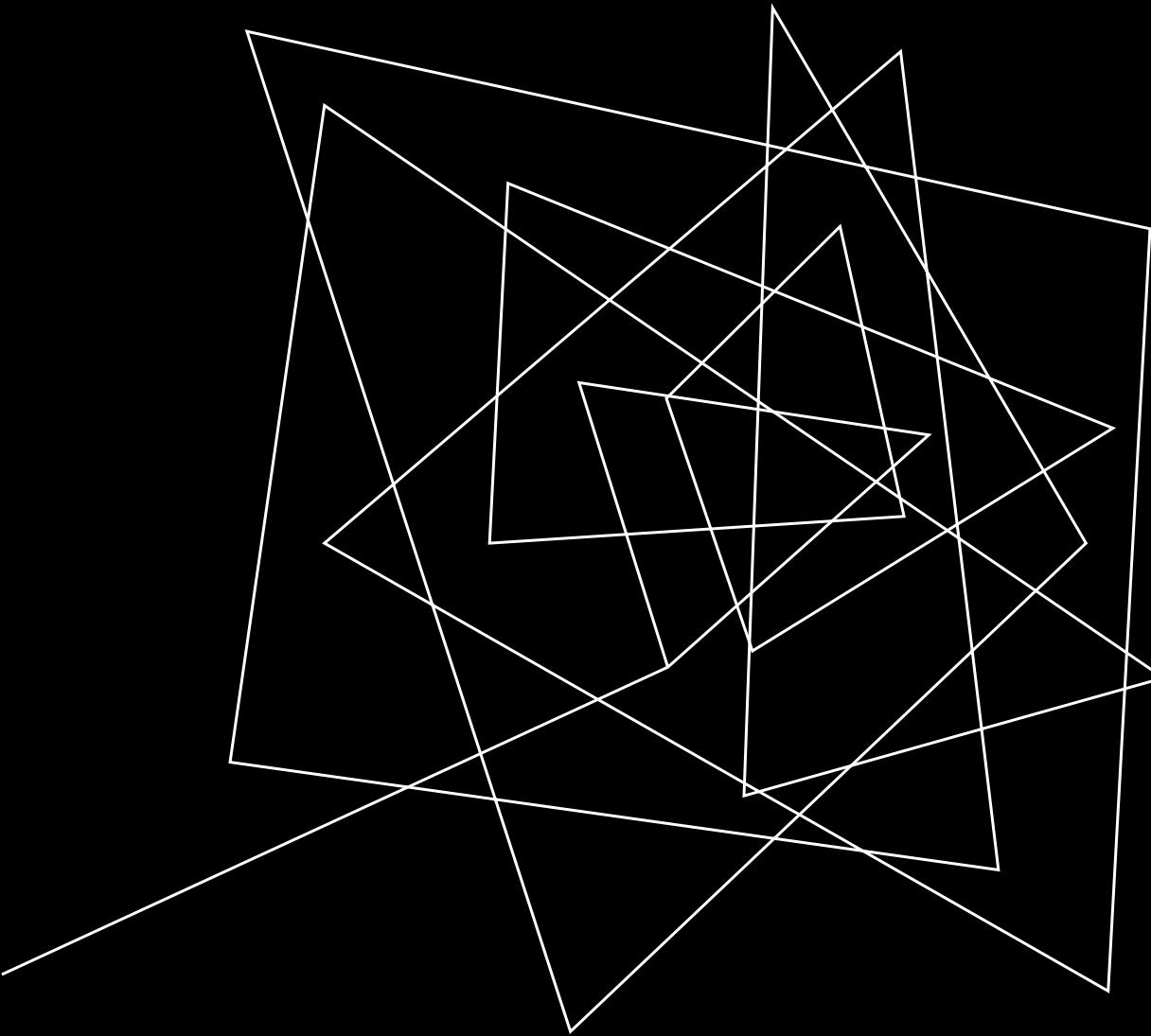
Add ? Remove Clear

Select up to four moves (4/4 chosen).

Ability: Thermal Exchange Item: Loaded Dice

Item style: balanced

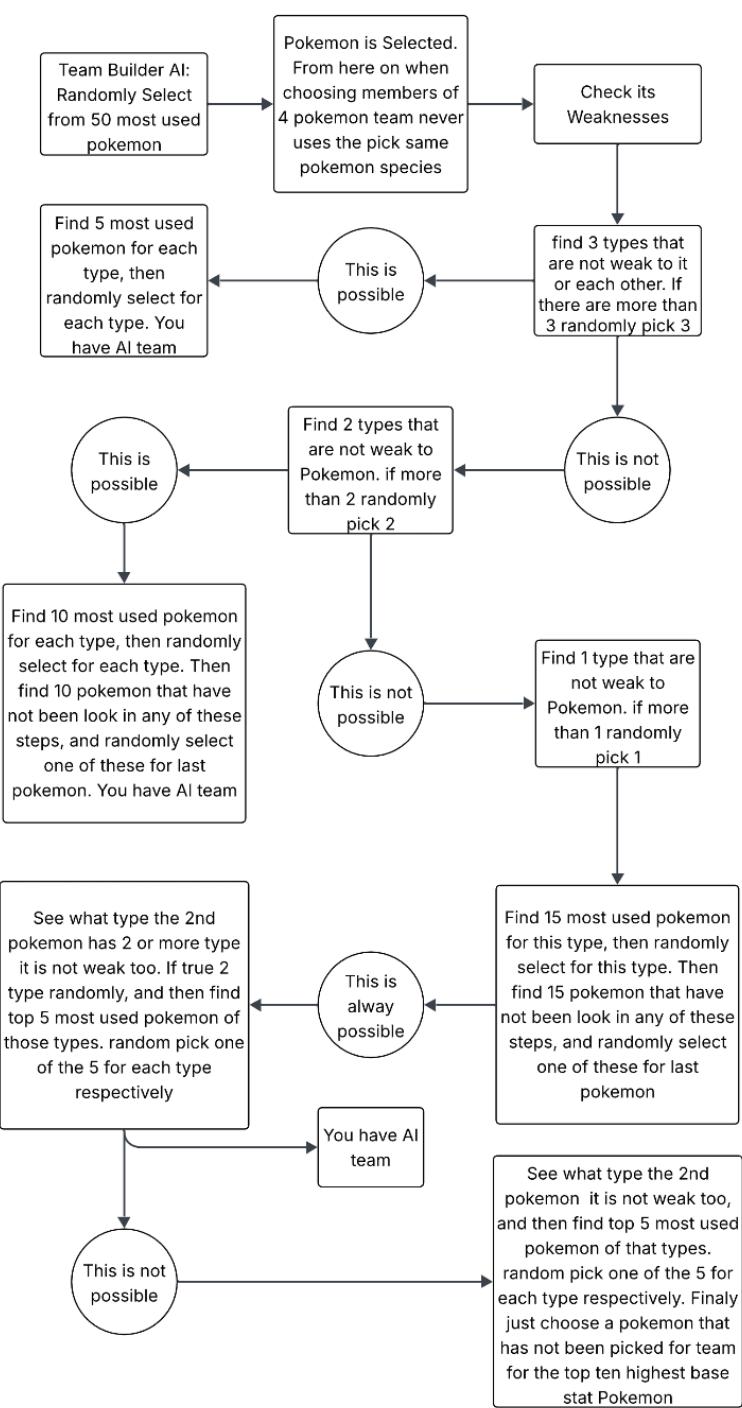
Loaded Dice  
Assault Vest  
Clear Amulet  
Thermal Exchange  
Ice Body



# AI TEAM BUILDER AND BATTLER ALGORITHMS

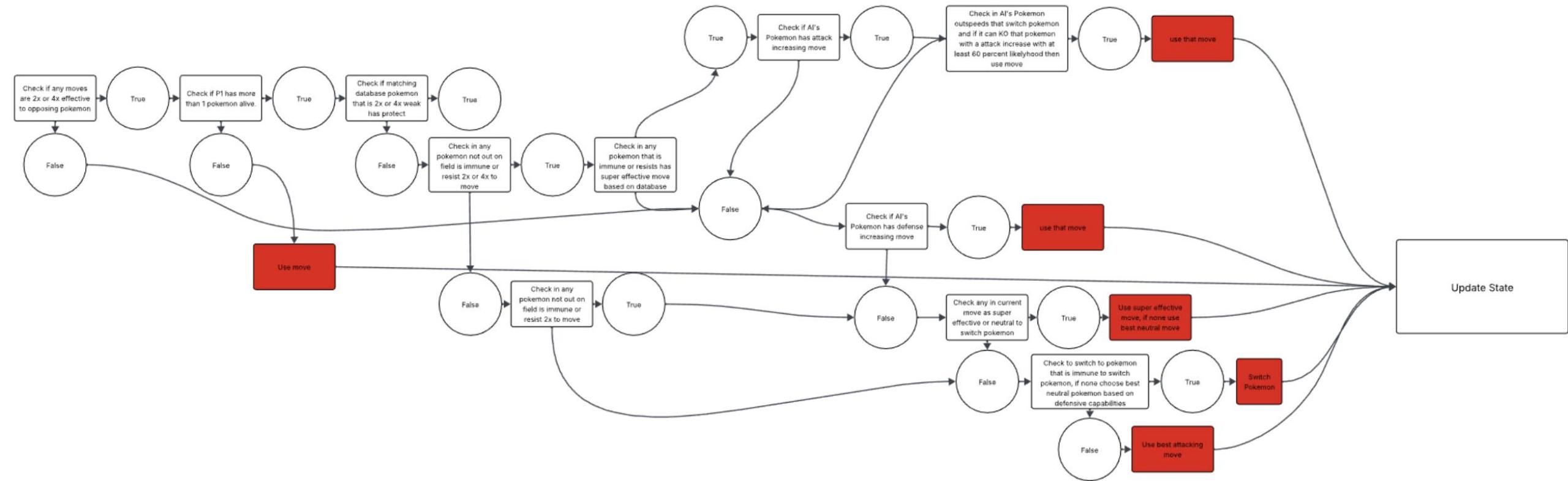
# TEAM BUILDER

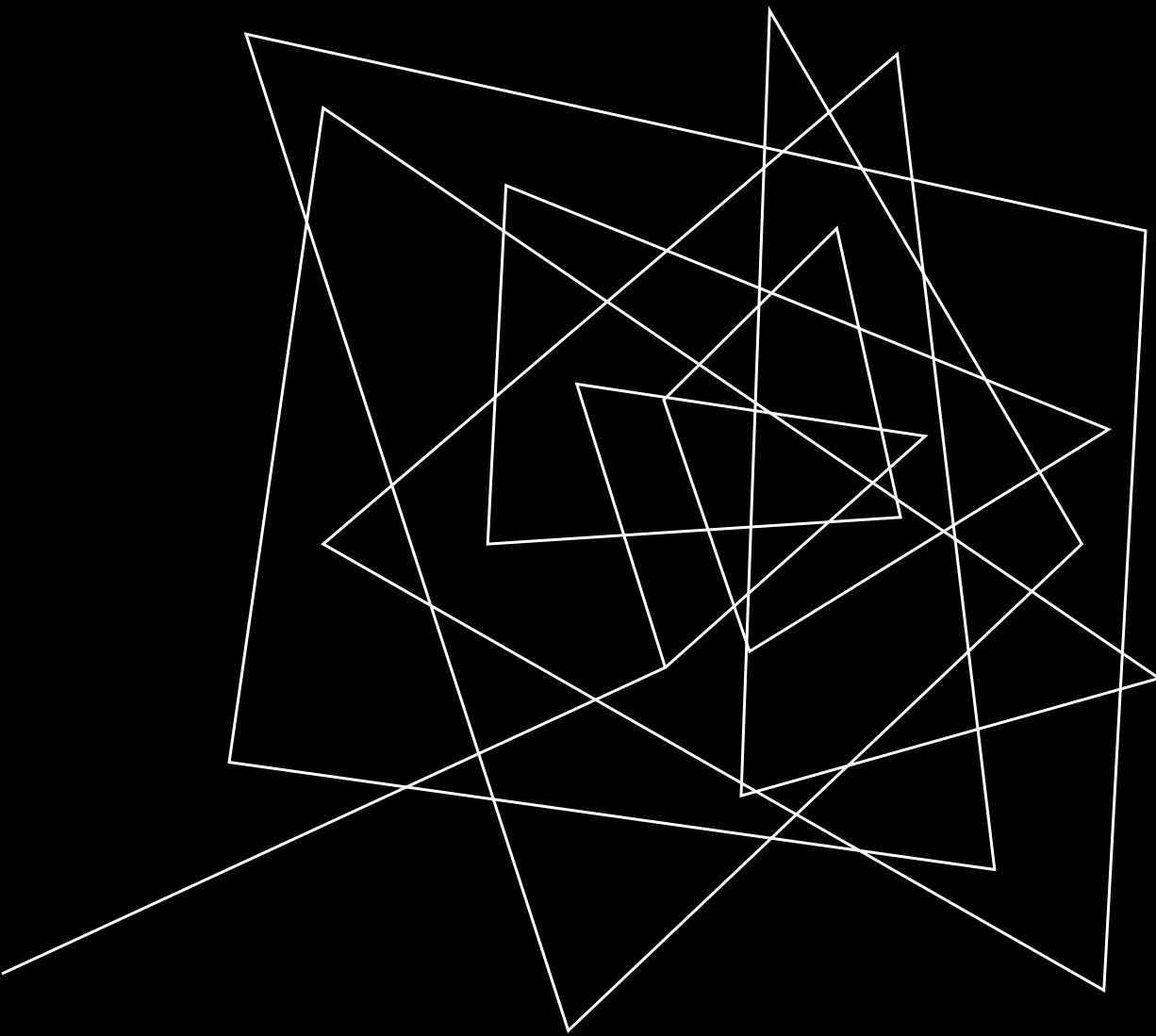
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When we were designing the team builder, our original Algorithm would always poke the same Pokémon. Since it was deterministic, we used the statistics from Pikalytics to design a team builder for the AI to used with elements of randomized selection. We mad it pick the most used Pokémon because they are typically the best Pokémon while making sure to pick complementary types.

# AI BATTLER ALGORITHM





Now Let's Run  
our Application!