



**Digital Skill Fair 29.0**

# **Portfolio**

**DATA SCIENCE ASSIGNMENT**

× × × ×

**BY KARINA AURALIA**



01

## Table of Content

- **About Pokémon**
- **Dataset**
- **Data Visualization**
- **Conclusion**



# Pokémon

**Pokémon**, short for "**Pocket Monsters**," is a globally popular media franchise created by **Satoshi Tajiri** and **Ken Sugimori**, and managed by The Pokémon Company, a collaboration between Nintendo, Game Freak, and Creatures. The franchise began with the release of Pokémon Red and Green (Blue in international markets) video games for the Game Boy in 1996.

The Pokémon universe revolves around fictional creatures called Pokémon, which humans, known as **Pokémon Trainers**, catch and train to battle each other for sport. Over the years, Pokémon has expanded to include video games, trading card games, animated TV series, movies, toys, and various merchandise.



× × × ×

# Dataset



# Dataset

This is a small sample of the data that will be analyzed.

#	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary
1	Bulbasaur	Grass	Poison	318	45	49	49	65	65	45	1	FALSE
2	Ivysaur	Grass	Poison	405	60	62	63	80	80	60	1	FALSE
3	Venusaur	Grass	Poison	525	80	82	83	100	100	80	1	FALSE
3	VenusaurMega Venusaur	Grass	Poison	625	80	100	123	122	120	80	1	FALSE
4	Charmander	Fire		309	39	52	43	60	50	65	1	FALSE
5	Charmeleon	Fire		405	58	64	58	80	65	80	1	FALSE
6	Charizard	Fire	Flying	534	78	84	78	109	85	100	1	FALSE
6	CharizardMega Charizard X	Fire	Dragon	634	78	130	111	130	85	100	1	FALSE
6	CharizardMega Charizard Y	Fire	Flying	634	78	104	78	159	115	100	1	FALSE
7	Squirtle	Water		314	44	48	65	50	64	43	1	FALSE
8	Wartortle	Water		405	59	63	80	65	80	58	1	FALSE
9	Blastoise	Water		530	79	83	100	85	105	78	1	FALSE
9	BlastoiseMega Blastoise	Water		630	79	103	120	135	115	78	1	FALSE
10	Caterpie	Bug		195	45	30	35	20	20	45	1	FALSE





# Dataset Information

```
# Mencari informasi dari dataset
data.info()

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 800 entries, 0 to 799
Data columns (total 13 columns):
 #   Column      Non-Null Count  Dtype  
---  --  
 0   #           800 non-null    int64  
 1   Name        800 non-null    object  
 2   Type 1     800 non-null    object  
 3   Type 2     414 non-null    object  
 4   Total       800 non-null    int64  
 5   HP          800 non-null    int64  
 6   Attack      800 non-null    int64  
 7   Defense     800 non-null    int64  
 8   Sp. Atk     800 non-null    int64  
 9   Sp. Def     800 non-null    int64  
 10  Speed       800 non-null    int64  
 11  Generation  800 non-null    int64  
 12  Legendary   800 non-null    bool   
dtypes: bool(1), int64(9), object(3)
memory usage: 75.9+ KB
```

1. **#**: Unique index for each Pokémon.
2. **Name**: The name of each Pokémon.
3. **Type 1**: The main (primary) type of the Pokémon.
4. **Type 2**: The secondary type of the Pokémon. This column has some null values because not all Pokémon have a secondary type.
5. **Total**: Total of all basic attributes of the Pokémon.
6. **HP**: Hit Points, indicating the amount of health of the Pokémon.
7. **Attack**: Indicates the Pokémon's physical attack power.
8. **Defense**: Indicates the Pokémon's physical defense ability.
9. **Sp. Atk**: Special Attack, indicates the Pokémon's special attack power
10. **Sp. Def**: Special Defense, denotes the Pokémon's special defense ability.
11. **Speed**: Indicates the Pokémon's speed.
12. **Generation**: Indicates the generation of the Pokémon, from 1 to 6.
13. **Legendary**: A boolean column indicating whether the Pokémon is Legendary (True) or not (False).

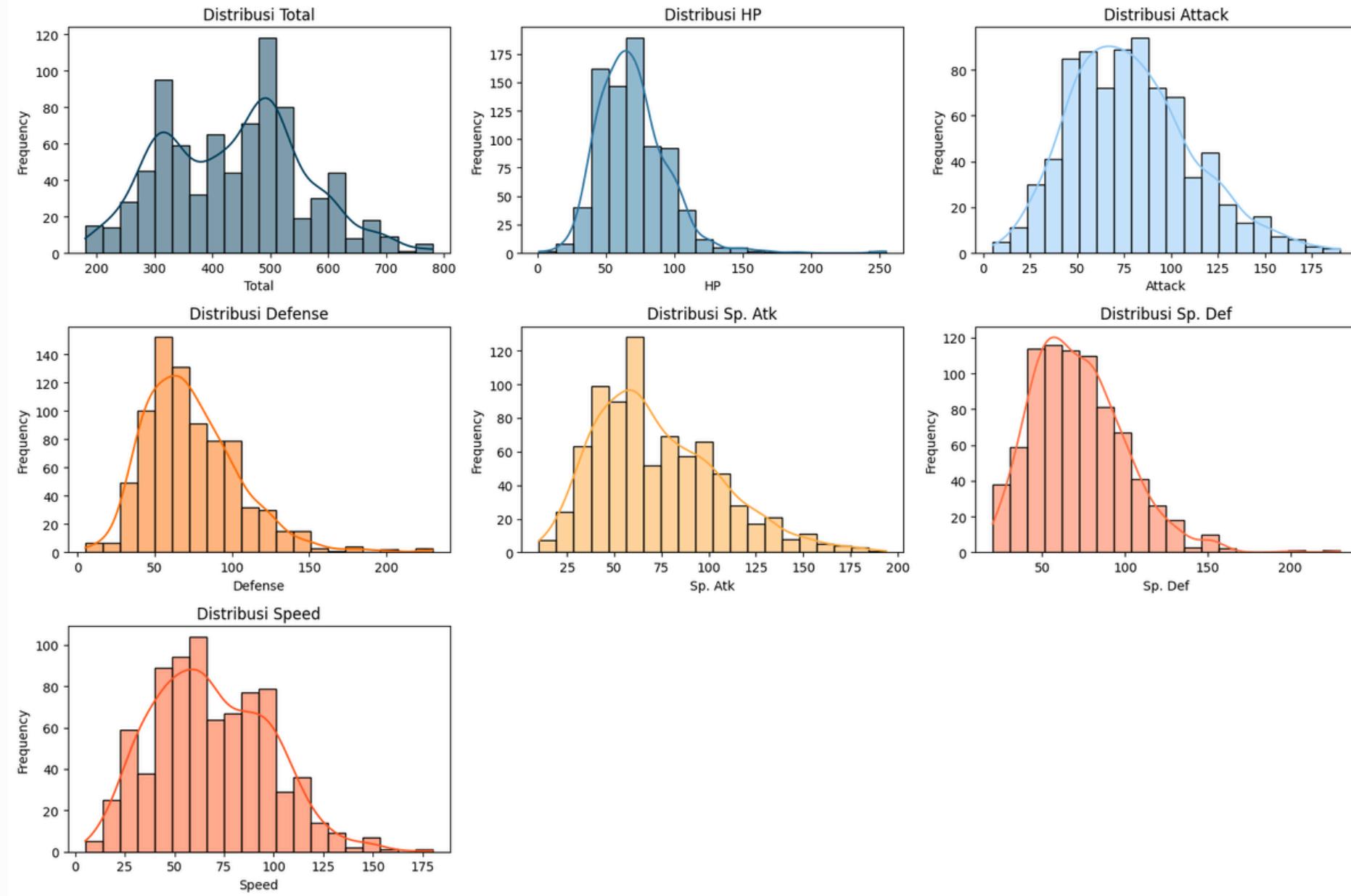




# Data Visualization



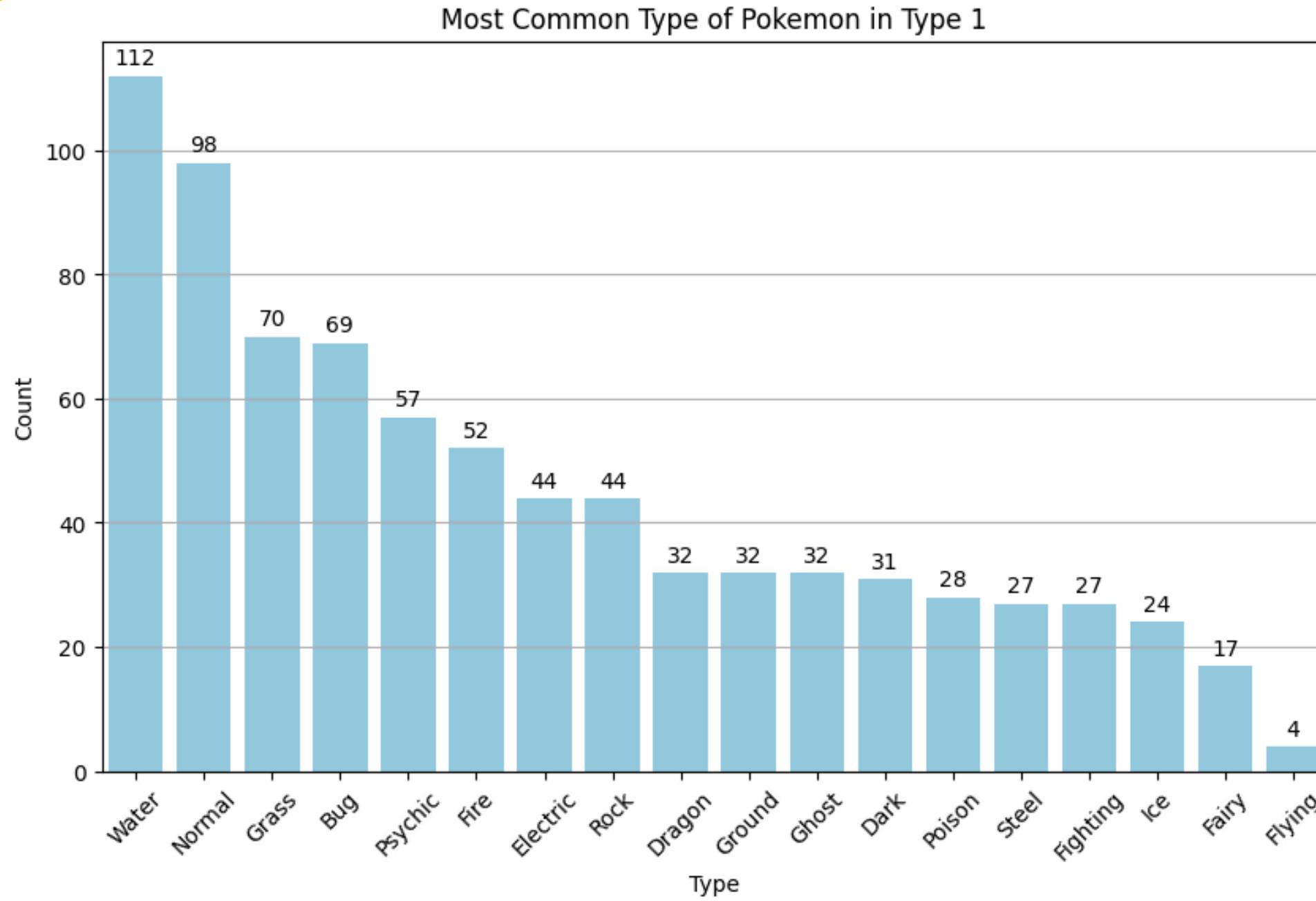
# Pokémon Attributes Distribution



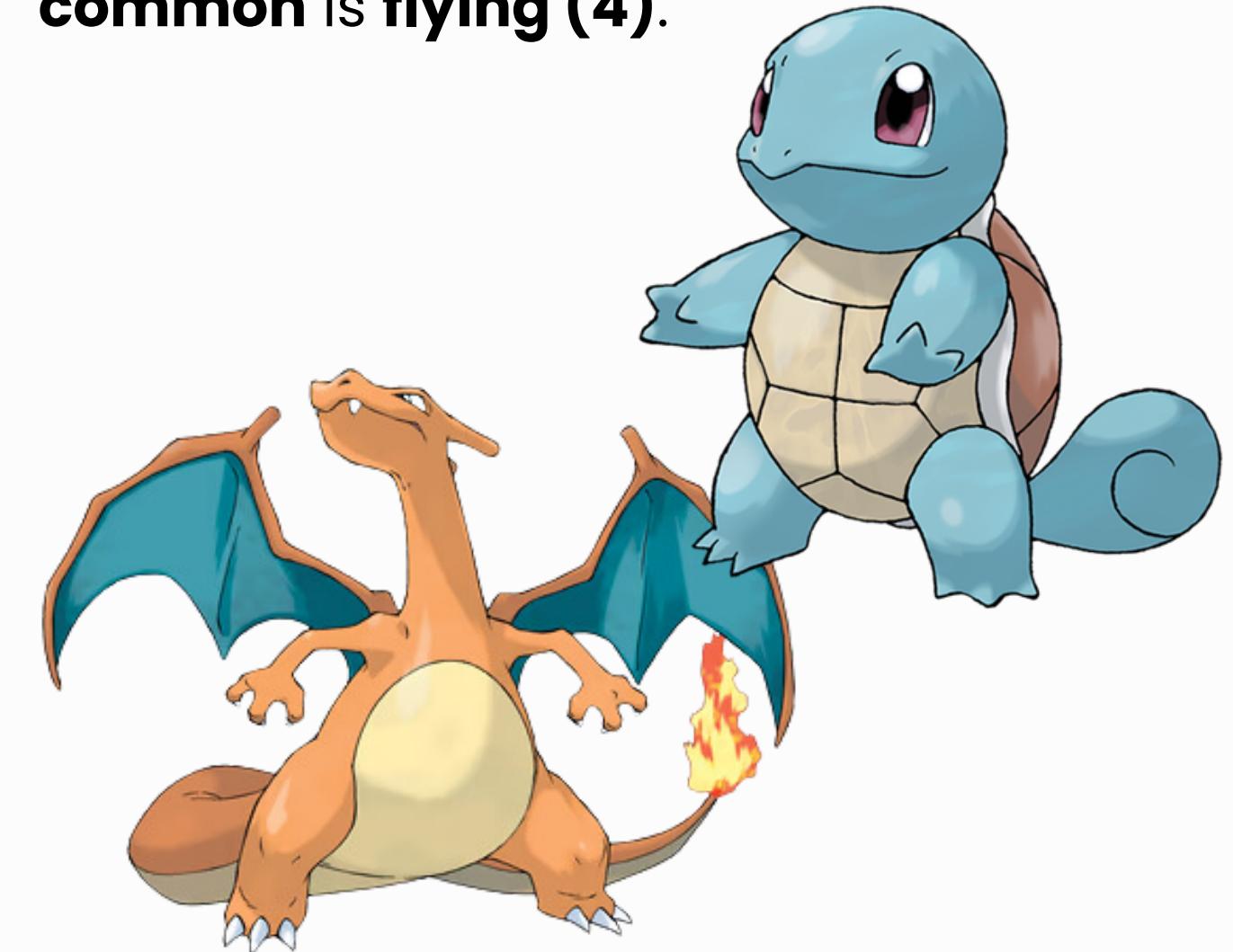
Overall, most Pokémon attribute distributions are close to **normal** but **skewed to the right**. The right skewed shape of the distribution indicates that most Pokémon have **lower to medium** stats, with only **a few** having **very high stats**. This may reflect the game design that makes most Pokémon have average stats, while only a few have high stats, perhaps to maintain balance in the game.



# The Most Common Type of Pokémon in Type 1



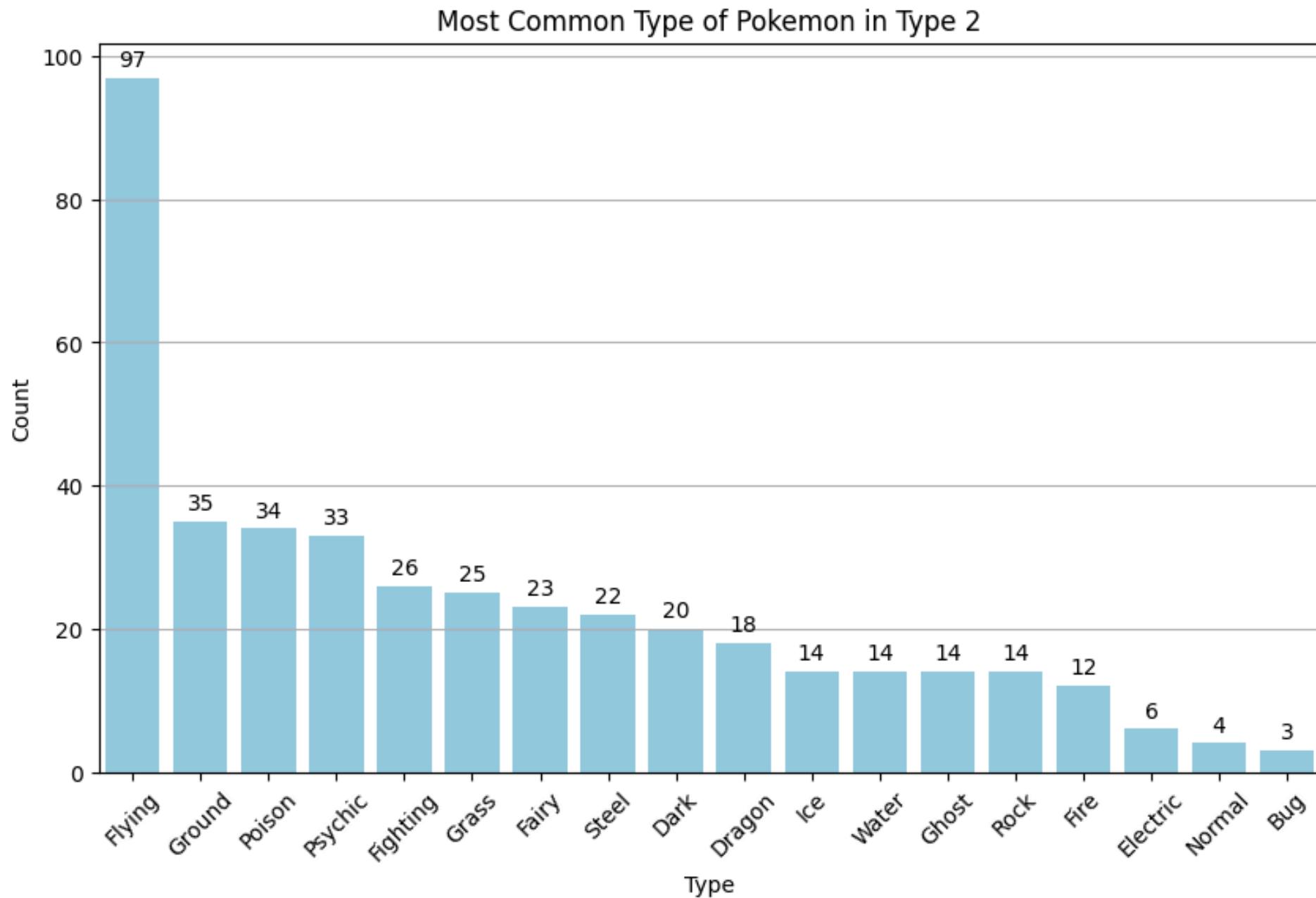
Based on the analysis, the **most common** type of pokémon in Type 1 is **water (112)** and the **least common** is **flying (4)**.





# The Most Common Type of Pokémon in Type 2

From the analysis, the **most common** type 2 (secondary type) in Pokémon is **Flying**, with **97** Pokémon having it as a secondary type. Meanwhile, the **least common** secondary type is **Bug**, with only **3** Pokémon having it.



# Pokémon with Dual Type

## # Menghitung jumlah Pokémon yang memiliki dua tipe

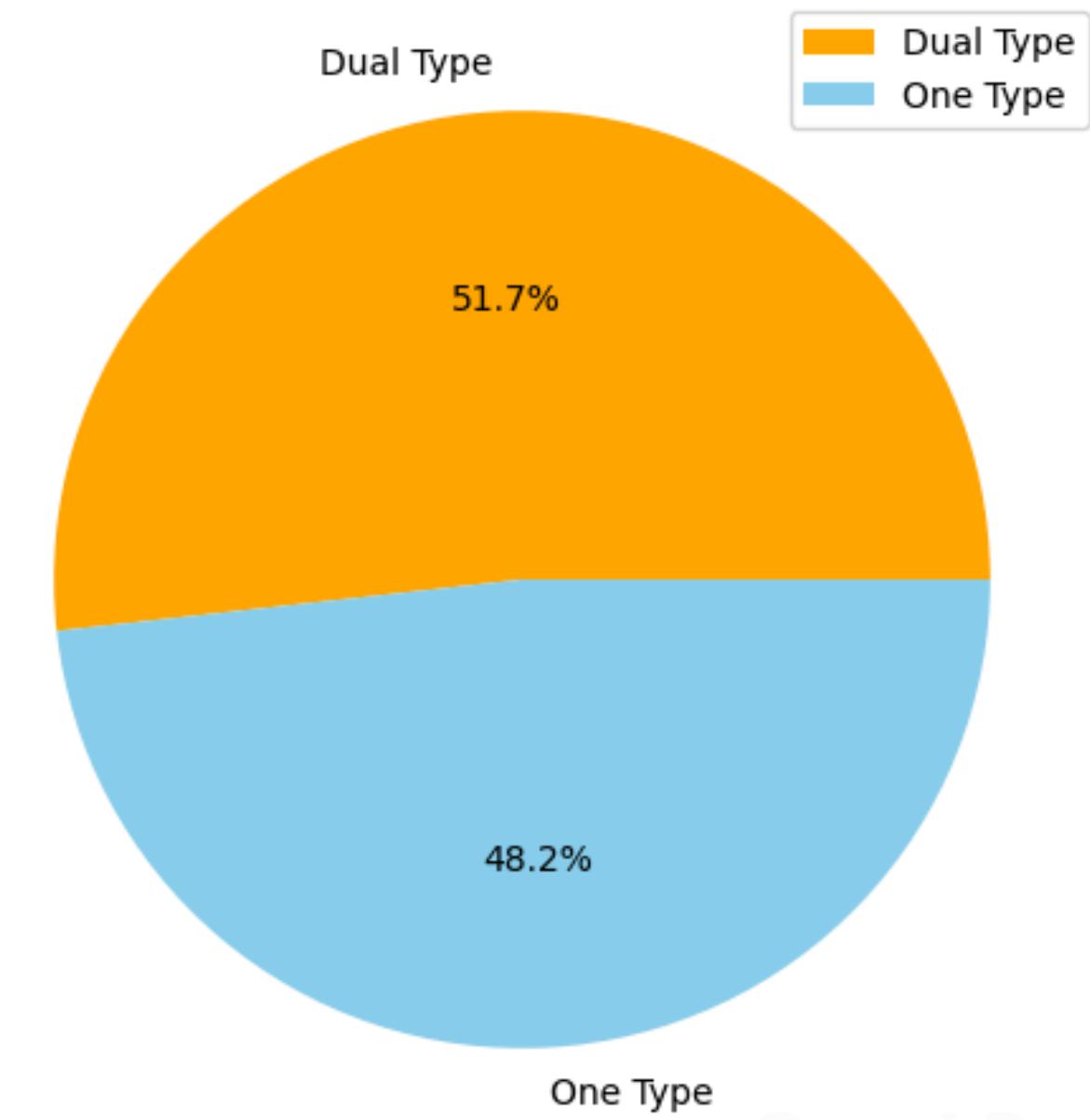
```
Dual_Type = data['Type 2'].notnull().value_counts()  
print(Dual_Type)
```

## # Visualisasi Data

```
labels = ['Dual Type', 'One Type']  
plt.figure(figsize=(6, 6))  
plt.pie(Dual_Type, labels=labels, autopct='%.1f%%', colors=['orange', 'skyblue'])  
plt.title('Percentage of Pokemon with Dual Type')  
plt.legend(labels=labels, loc='upper right')  
plt.show()
```

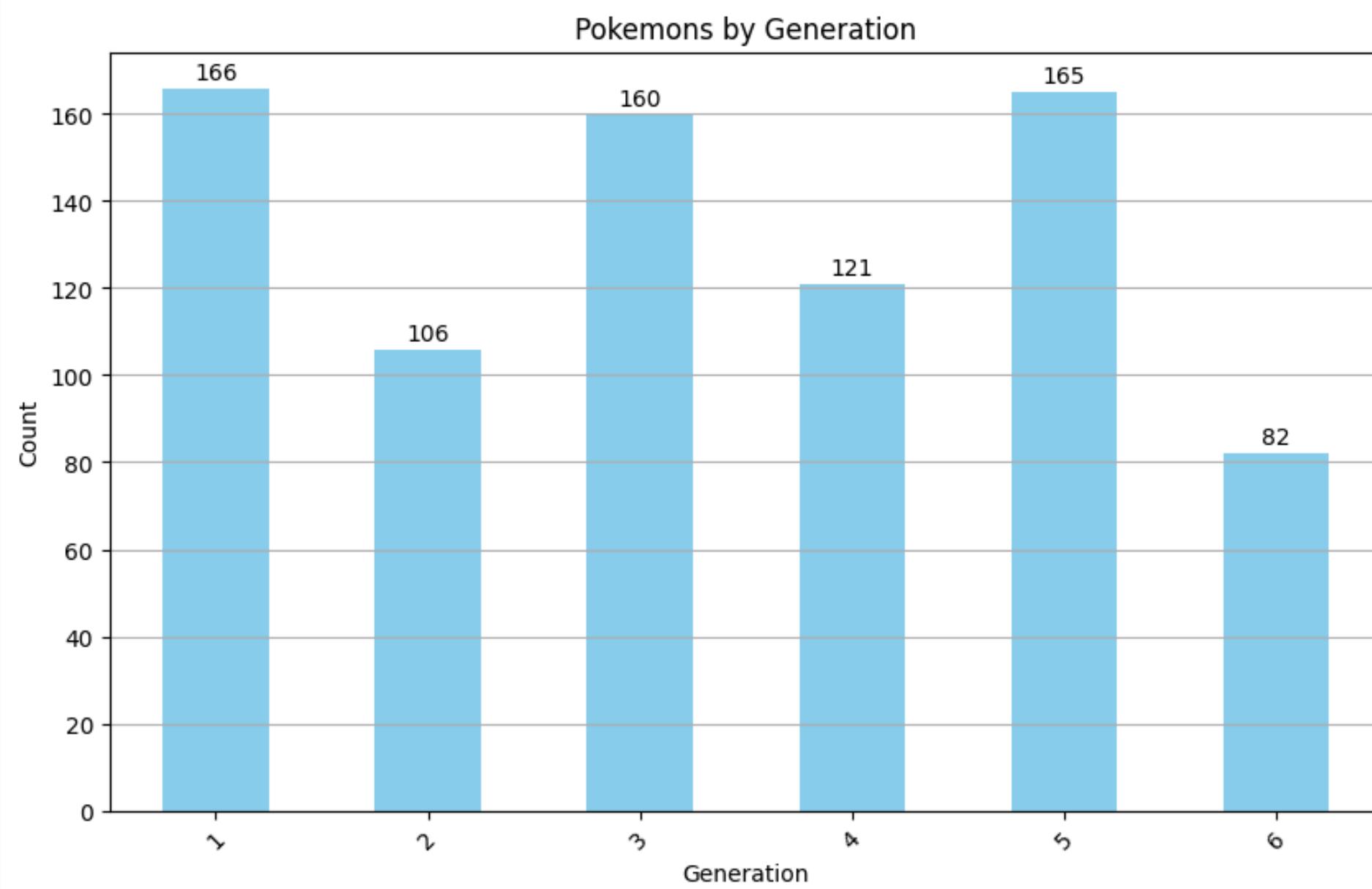
From the analysis, most of the Pokémons in the dataset have **dual types**, with a total of **414 Pokémons (51.7%)**, while **386 Pokémons (48.2%)** only have **one type**. The majority of Pokémons that have dual types shows that Pokémons often combine two types to provide advantages in battle, such as having access to attacks and resistances of two different types.

Percentage of Pokemon with Dual Type





# Pokémon by Generations



The chart shows the number of Pokémons by generation. The **first generation** has the **most Pokémons**, with **166**, followed by the **fifth** with **165** and the **third** with **160**. The **fourth generation** has **121** Pokémons. The **second** and **sixth generations** have the fewest, at **106** and **82**, respectively. This shows the variation in the number of Pokémons introduced in each generation.

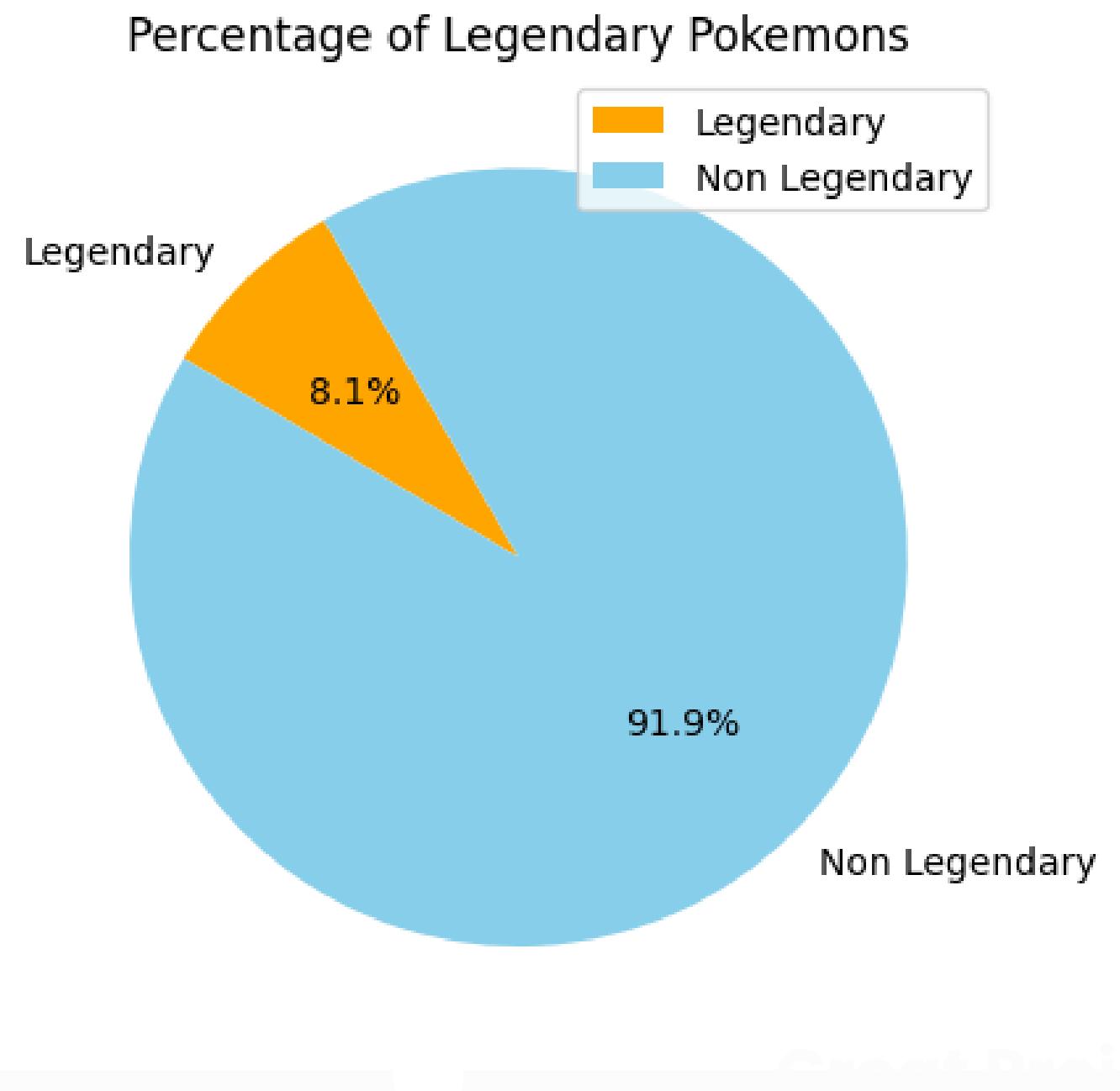


# Legendary Pokémons

```
# Pokemon berdasarkan legendari
Legendary = data.groupby('Legendary').size()
Legendary

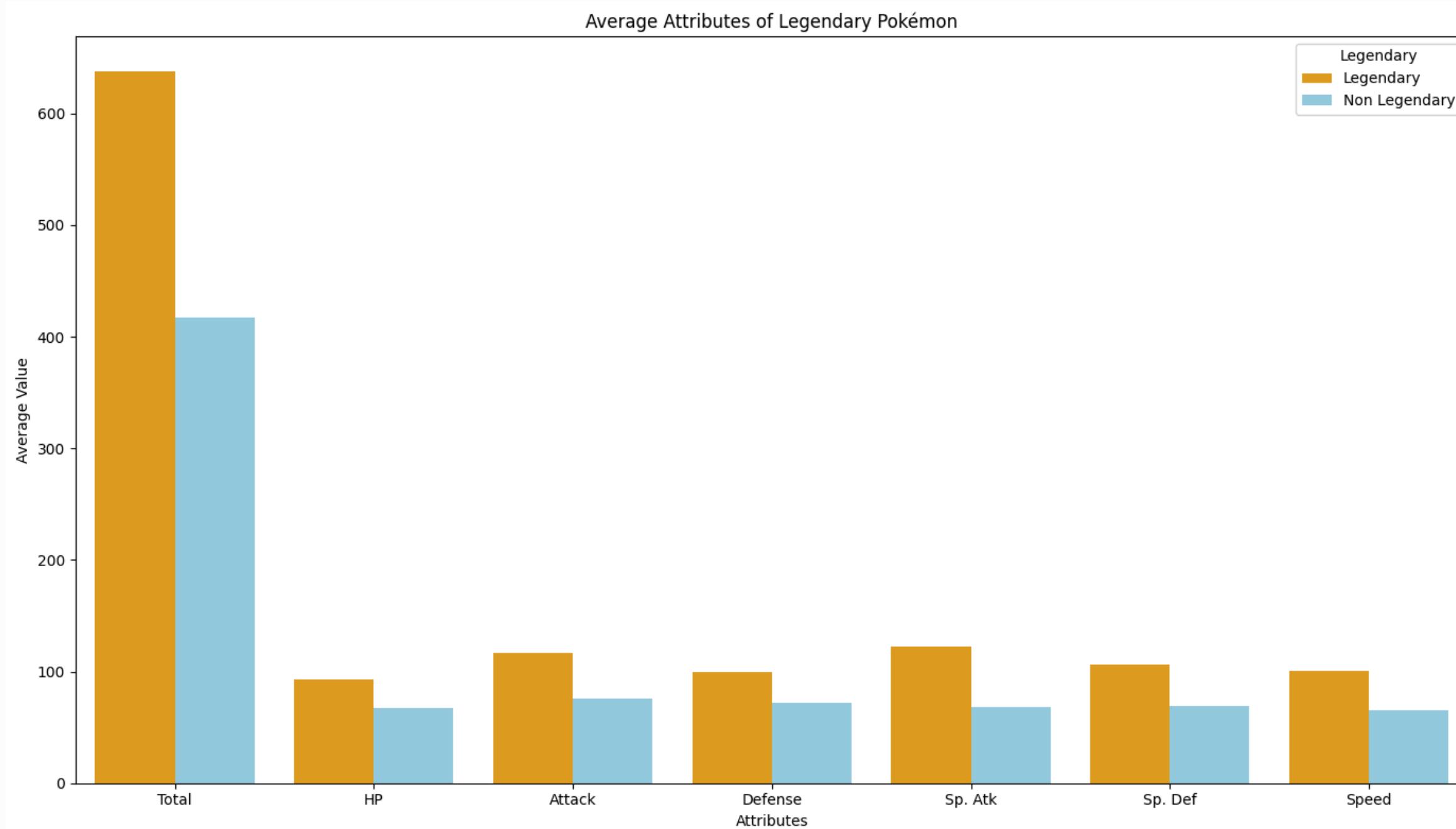
Legendary          65
Non Legendary     735
dtype: int64
```

Only **65** of the **800 Pokémons** are **Legendary**. This shows that Legendary Pokémons are **rare**. They account for only about **8%** of the Pokémons population. Their special status and unique power make them highly valued. They are often the main objective in various Pokémons games and stories.





# Pokémon Attributes by Legendary



Overall, **Legendary Pokémon** have significantly **higher** attribute averages compared to **Non-Legendary Pokémon** in all measured attribute categories. This shows that **Legendary Pokémon** are designed to be **stronger** and **superior** to **Non-Legendary Pokémon**, in accordance with their rarer and more powerful status in the game context.



# Pokémon with Above Average Scores

```
Rata-rata dari Total, HP, Attack, Defense, Sp. Atk, Sp. Def, dan Speed:  
Total      435.10250  
HP        69.25875  
Attack    79.00125  
Defense   73.84250  
Sp. Atk    72.82000  
Sp. Def    71.90250  
Speed     68.27750  
dtype: float64
```

Pokémon that are **above average** on any of the attributes are considered **stronger** or **superior Pokémons** in terms of that particular attribute.

Pokemon dengan nilai di atas rata-rata:													
	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary	
366	Altaria	Mega Altaria	Dragon	Fairy	590	75	110	110	110	105	80	3	Non Legendary
64	Arcanine	Fire		Nan	555	90	110	80	100	80	95	1	Non Legendary
552	Arceus	Normal		Nan	720	120	120	120	120	120	120	4	Legendary
156	Articuno	Ice	Flying	580	90	85	100	95	125	85	1	Legendary	
11	Blastoise	Water		Nan	530	79	83	100	85	105	78	1	Non Legendary
...	...	...	...	...	...	...	...	...	...	...	...	...	...
792	Xerneas	Fairy		Nan	680	126	131	95	131	98	99	6	Legendary
793	Yveltal	Dark	Flying	680	126	131	95	131	98	99	6	Legendary	
157	Zapdos	Electric	Flying	580	90	90	85	125	90	100	1	Legendary	
707	Zekrom	Dragon	Electric	680	100	150	120	120	100	90	5	Legendary	
794	Zygarde50% Forme	Dragon	Ground	600	108	100	121	81	95	95	6	Legendary	

Using this analysis, players can identify Pokémons that have **greater** potential in battle or that are **better** in certain aspects, so as to make more **effective strategies** in the game.





# Pokémon with The Highest and Lowest Status



## Pokémon with The Highest Status by “Total” Column

index	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary
164	Mewtwo Mega Mewtwo Y	Psychic	NaN	780	106	150	70	194	120	140	1	Legendary
163	Mewtwo Mega Mewtwo X	Psychic	Fighting	780	106	190	100	154	100	130	1	Legendary
426	Rayquaza Mega Rayquaza	Dragon	Flying	780	105	180	100	180	100	115	3	Legendary
422	Kyogre Primal Kyogre	Water	NaN	770	100	150	90	180	160	90	3	Legendary
424	Groudon Primal Groudon	Ground	Fire	770	100	180	160	150	90	90	3	Legendary

## Pokémon with The Lowest Status by “Total” Column

index	Name	Type 1	Type 2	Total	HP	Attack	Defense	Sp. Atk	Sp. Def	Speed	Generation	Legendary
206	Sunkern	Grass	NaN	180	30	30	30	30	30	30	2	Non Legendary
322	Azurill	Normal	Fairy	190	50	20	40	20	40	20	3	Non Legendary
446	Kricketot	Bug	NaN	194	37	25	41	25	41	25	4	Non Legendary
13	Caterpie	Bug	NaN	195	45	30	35	20	20	45	1	Non Legendary
16	Weedle	Bug	Poison	195	40	35	30	20	20	50	1	Non Legendary





# Pokémon Attributes

HP

## Pokemon with The Highest HP



Name	Blissey
Type 1	Normal
Type 2	NaN
Total	540
HP	255
Attack	10
Defense	10
Sp. Atk	75
Sp. Def	135
Speed	55
Generation	2
Legendary	Non Legendary
Name:	261, dtype: object

## Pokemon with The Lowest HP



Name	Shedinja
Type 1	Bug
Type 2	Ghost
Total	236
HP	1
Attack	90
Defense	45
Sp. Atk	30
Sp. Def	30
Speed	40
Generation	3
Legendary	Non Legendary
Name:	316, dtype: object

Among other Pokémon, **Blissey** has the **highest** HP of **255** and **Shedinja** has the **lowest** HP of **1**. This difference reflects the very different roles and abilities between these two Pokémon in battle.



# Pokémon Attributes

## Attack

### Pokemon with The Highest Attack



Name	Mewtwo	Mega Mewtwo	X
Type 1			Psychic
Type 2			Fighting
Total			780
HP			106
Attack			190
Defense			100
Sp. Atk			154
Sp. Def			100
Speed			130
Generation			1
Legendary			Legendary
Name:	163	, dtype:	object

## Defense

### Pokemon with The Highest Defense



Name	Aggron	Mega Aggron	Steel
Type 1			NaN
Type 2			630
Total			70
HP			140
Attack			230
Defense			60
Sp. Atk			80
Sp. Def			50
Speed			3
Generation			Non Legendary
Legendary			Legendary
Name:	333	, dtype:	object

The results show that the Pokémon that has **the highest attack** is **Mewtwo Mega Mewtwo X**, which is **190**.

**Aggron Mega Aggron** is one of the Pokémon that has **the highest Defense (230)**.





# Pokémon Attributes

Special  
Attack

## Pokemon with The Highest Special Attack



Name	Mewtwo	Mega Mewtwo Y
Type 1		Psychic
Type 2		NaN
Total		780
HP		106
Attack		150
Defense		70
Sp. Atk	194	
Sp. Def	120	
Speed		140
Generation		1
Legendary		Legendary
Name:	164,	dtype: object

Special  
Defense

## Pokemon with The Highest Special Defense



Name	Shuckle
Type 1	Bug
Type 2	Rock
Total	505
HP	20
Attack	10
Defense	230
Sp. Atk	10
Sp. Def	230
Speed	5
Generation	2
Legendary	Non Legendary
Name:	230,
	dtype: object

**Mewtwo Mega Mewtwo Y** is Pokémon that has the highest Special Attack (194).

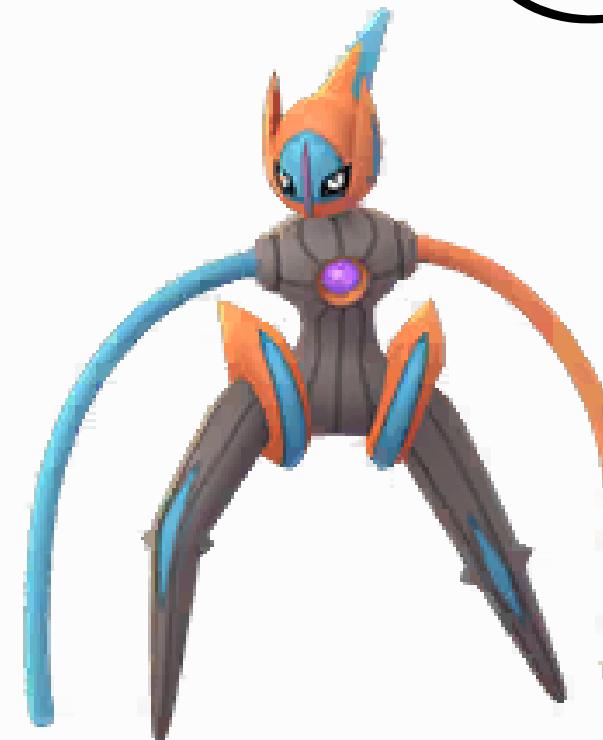
**Shuckle** is one of the Pokémon that has the highest Special Defense (230).



# Pokémon Attributes

## Speed

### Pokemon with The Highest Speed



Name	Deoxys Speed Forme
Type 1	Psychic
Type 2	NaN
Total	600
HP	50
Attack	95
Defense	90
Sp. Atk	95
Sp. Def	90
Speed	180
Generation	3
Legendary	Legendary
Name:	431, dtype: object

### Pokemon with The Lowest Speed

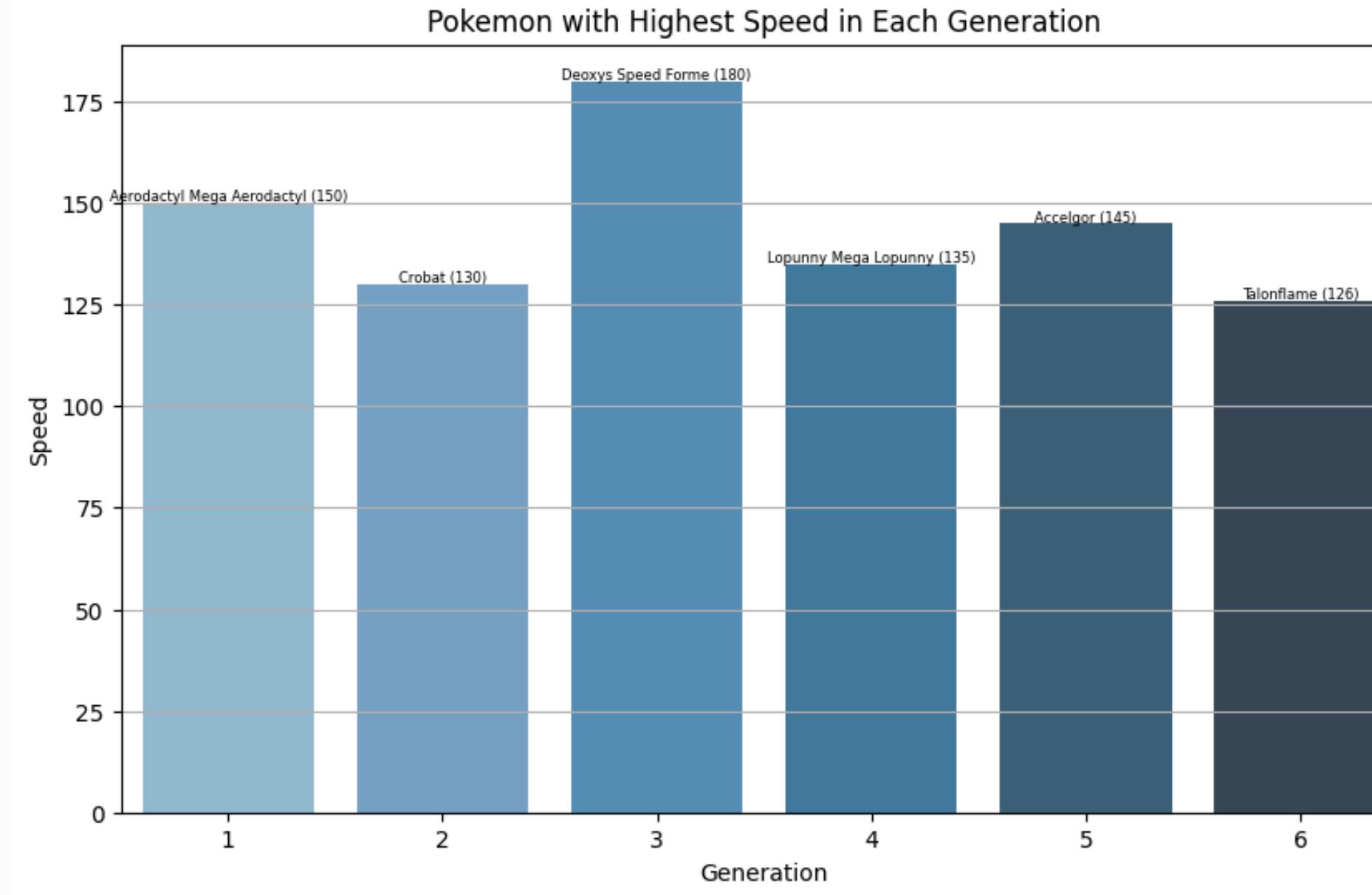


Name	Munchlax
Type 1	Normal
Type 2	NaN
Total	390
HP	135
Attack	85
Defense	40
Sp. Atk	40
Sp. Def	85
Speed	5
Generation	4
Legendary	Non Legendary
Name:	495, dtype: object

Of all the Pokémons **Deoxys Speed Forme** is the **fastest** Pokémon with a speed attribute of **180**. Conversely, there is a **Munchlax** which has the smallest speed at **5**.



# Pokémon with Highest Speed in Each Generation



Of the six generations of Pokémons, each has a representative with the highest speed, which shows the importance of this attribute in battle.

**Gen 1:** Aerodactyl Mega Aerodactyl

**Gen 2:** Crobat

**Gen 3:** Deoxys Speed Forme

**Gen 4:** Lopunny Mega Lopunny

**Gen 5:** Accelgor

**Gen 6:** Talonflame



# Pokémon with Highest Speed in Each Generation

**Gen 1:** Aerodactyl Mega  
Aerodactyl



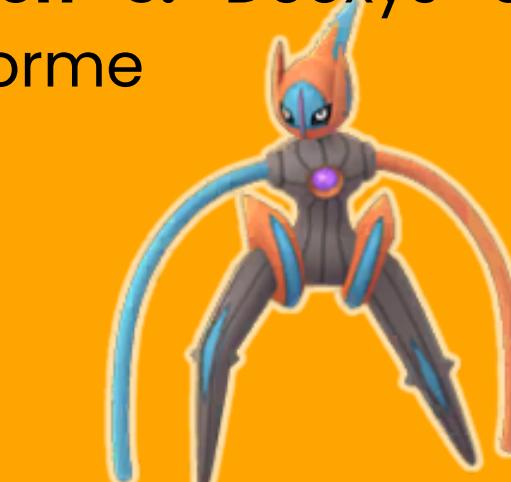
**Speed:** 150

**Gen 2:** Crobat



**Speed:** 130

**Gen 3:** Deoxys Speed  
Forme



**Speed:** 180

**Gen 4:** Lopunny Mega  
Lopunny



**Speed:** 135

**Gen 5:** Accelgor



**Speed:** 145

**Gen 6:** Talonflame

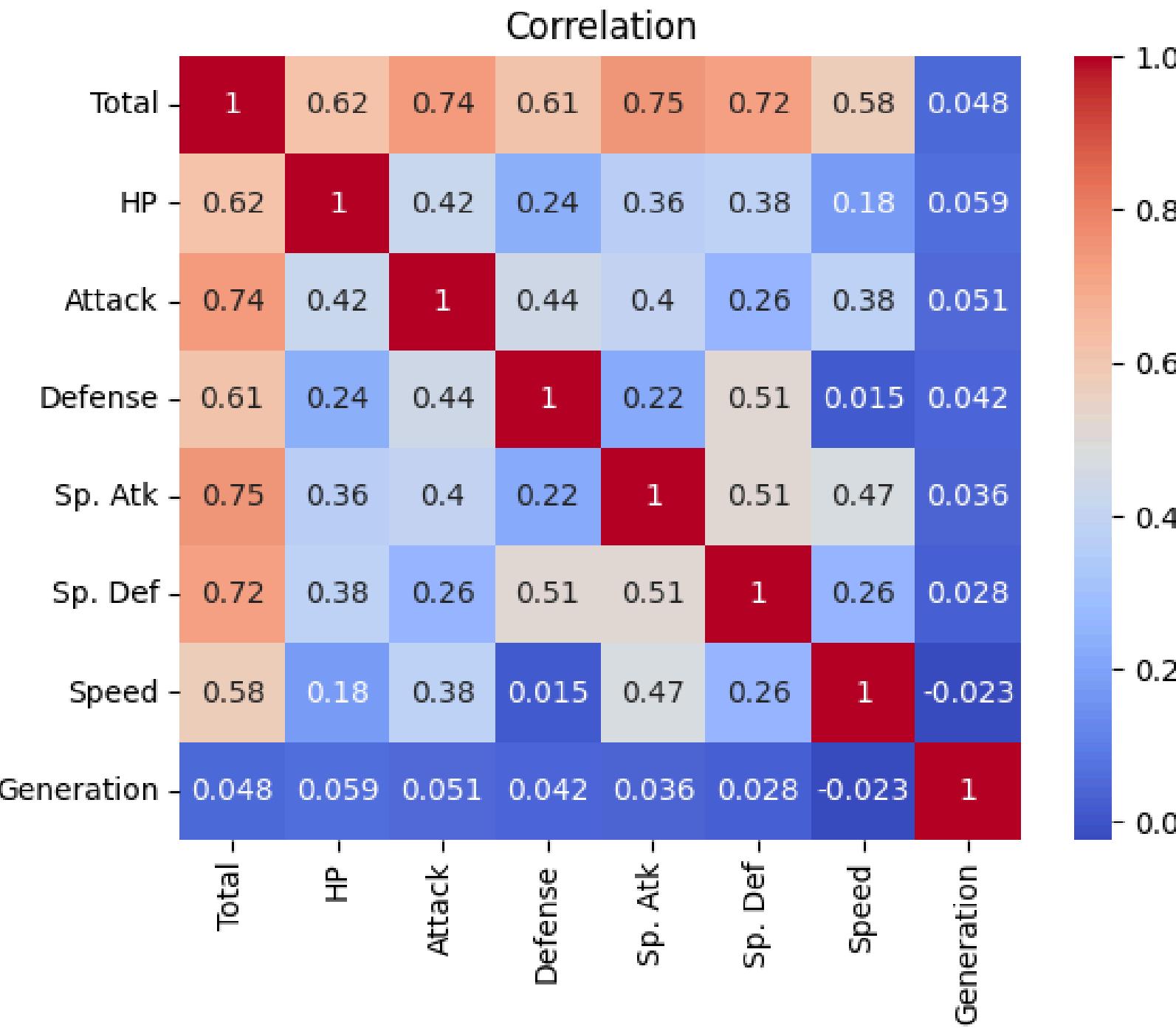


**Speed:** 126



# Correlation

The correlation matrix shows how different Pokémon attributes relate to each other. The **total** value of a Pokémon is **significantly influenced** by **all attributes**, including HP, Attack, and so forth. **Generation** has almost **no effect** on **other attributes**. Correlations between individual attributes show varying relationships. **Attack** and **Sp. Atk** have a **low correlation** (0.41), while **Defense** and **Sp. Def** have a **higher correlation** (0.51). This shows that **some attributes tend to evolve together**.





# Conclusion

This Pokémon data analysis provides a great overview of the distribution of Pokémon types, attributes, and rarity. **Water types** are **the most common**, while Legendary Pokémon are very rare but have much higher attributes compared to Non-Legendary Pokémon. **Legendary Pokémon** are only about **8%** of the total population, yet they have significantly higher attributes. In addition, **many Pokémon** are **above average** in certain attributes, which can be utilized for more effective battle strategies. Combining Pokémon of the two types and selecting Pokémon that are above average in attributes can provide a competitive advantage.

The information from this analysis can help players understand the characteristics and strengths of Pokémon, as well as how to utilize them to build a stronger and more effective team in battle.



# Thank You



- **Github:** <https://github.com/KarinaAuralia>
- **LinkedIn:** <https://www.linkedin.com/in/karinaauralia/>

