

Discussion

We wanted to explore the diversity of Pokemon through their types, their subcategories (like Mythical, Legendary, SubLegendary Pokemon), through their basic power stats (like height, weight, attack, HP, special attack, special defence, speed etc.). We also wanted to find out if there were significant differences across generations of Pokemon.

Starting with subcategories, SubLegendary and Legendary Pokemon were compared and their differences were investigated (question 1). SubLegendary Pokemon are a "subsection" of Legendary Pokemon which do not have the same restrictions of Legendary Pokemon (more information is available [here](#)). We wanted to explore the reason for this categorisation. Perhaps SubLegendary Pokemon aren't as strong as Legendary Pokemon so they wouldn't be as likely to overpower the opponent in a match.

We found mixed results to support this hypothesis. First, **AbilityInfo** shows that all SubLegendary have only one ability, as compared to 2 Legendary Pokemon which have two abilities out of a total of 38 (the remaining 36 Legendary have only one ability). This indicates that most Legendary and SubLegendary Pokemon are comparably powerful, but a few Legendary Pokemon are much stronger. Second, **DistributionByType** shows that SubLegendary-Pokemon are *more* diverse (in terms **PrimaryType**) as compared to LegendaryPokemon - SubLegendary Pokemon are distributed (quite evenly) into 15 types and Legendary Pokemon are distributed (less evenly) into 11 types. This may suggest that SubLegendary Pokemon are more "suited" for matches because they will be on a more even footing with most opponent types, as opposed to LegendaryPokemon which may be very strong against some types but much weaker against other types due to their uneven distribution. Third, and the strongest support for this hypothesis, comes from the **AvgStatsComparisonInfo** query. It shows that Legendary Pokemon have are stronger (i.e. have a higher value for a stat like height, weight, attack etc.) than SubLegendary Pokemon, on average. Since many of the values returned by this query are positive, it indicates that the average of a stat for Legendary is higher than the average of that state for SubLegendary Pokemon. Apart from a few stats for a few types (like SpecialAttack for Dragon type, SpecialDefence for Steel etc.), the differences are positive. It indicates that Legendary Pokemon are bigger, taller, faster, and have better attack than SubLegendaryPokemon, on average. In fact, every type of Legendary Pokemon has better attack stats than SubLegendaryPokemon.

Next, Mythical and non-Mythical Pokemon were compared (question 2). Intuitively, one might think Mythical Pokemon have better stats than non-mythical ones, and are harder to catch. We set out to explore that by taking the average of all the mythical and non-Mythical Pokemon's individual stats, and comparing. We ended up with highly conclusive results (see Query 2). A mythical Pokemon's HP, attack, defence and special defence are, on average, x1.35 that of a non-Mythical Pokemon's, while special attack is x1.58 that of a non-Mmythical's. A Mythical Pokemon's speed is, on average, x1.48 that of a non-Mythical Pokemon's. Mythical Pokemon are very hard to catch relative to their non-mythical counterparts, with non-mythical pokemons being 9 times easier to catch, on average!

Additionally, the difference between number of abilities of a Mythical Pokemon and a non-Mythical Pokemon were investigated. We did this by taking the total number of mythical Pokemon with one ability and two abilities separately, and then comparing them with their non-Mythical counterparts (see Query 3 and 4). We found out that every mythical Pokemon has only one ability, while around 48.5 percent ($\frac{483}{995}$) of non-Mythical Pokemon have only one ability, and the rest have more than one. Lastly, we wanted to inspect the first generation a mythical Pokemon appeared in (see Query 5), which we found to be the very first generation, which means mythical Pokemon have been around since the beginning of the series.

As games have sequels and additions, it may be intuitive to believe that the latter generations/versions are more complex than the former ones. This is what we wanted to explore through Pokemon generations (question 3). A Mythical Pokemon being present in the very first generation may suggest otherwise, but this may also just be an outlier, so this needed further investigation. To get a baseline of complexity across generations, the number of (primary) types of Pokemon in each generation was calculated in **NumGenInfo**. The very first Pokemon generation had almost every type of Pokemon, and this remains consistent across the generations!

To compare the differences of Pokemon across generations, $\text{Range} = \text{Maximum} - \text{Minimum}$ of averages of each stat (height, weight, attack etc.) for each type across generations was computed. To make sense of this range, we

need to know what the scale/value of the stat is, which we get by computing the average of averages of each stat called **AvgAvgStat** for each type across generations. Then, for each stat, range and **AvgAvgStat** are compared in **RangeAvgByType**. The main differences in strength of Pokemon are as follows: Steel, Ghost, Poison, Dark Pokemon have significantly higher range than average of Height, which indicates that there is a generation in which these types of Pokemon are much taller than their counterparts in other generations. Most types have such large discrepancies between range and **AvgAvgStat** in weight, so there are some generations which are overpowered in this stat. Only Dark Pokemon of some generation are overpowered in HP compared to the rest. The generations are more equal in Attack, Defence, SpecialAttack, SpecialDefence, and Speed. Hence, the main differences in Pokemon across generations is their height and weight. In fact, across generations are mostly equal in battle stats, apart from a few outliers, which is expected.

Our investigation shows that Pokemon, as a game, has maintained its level of complexity and rich diversity of its 'animals.'