

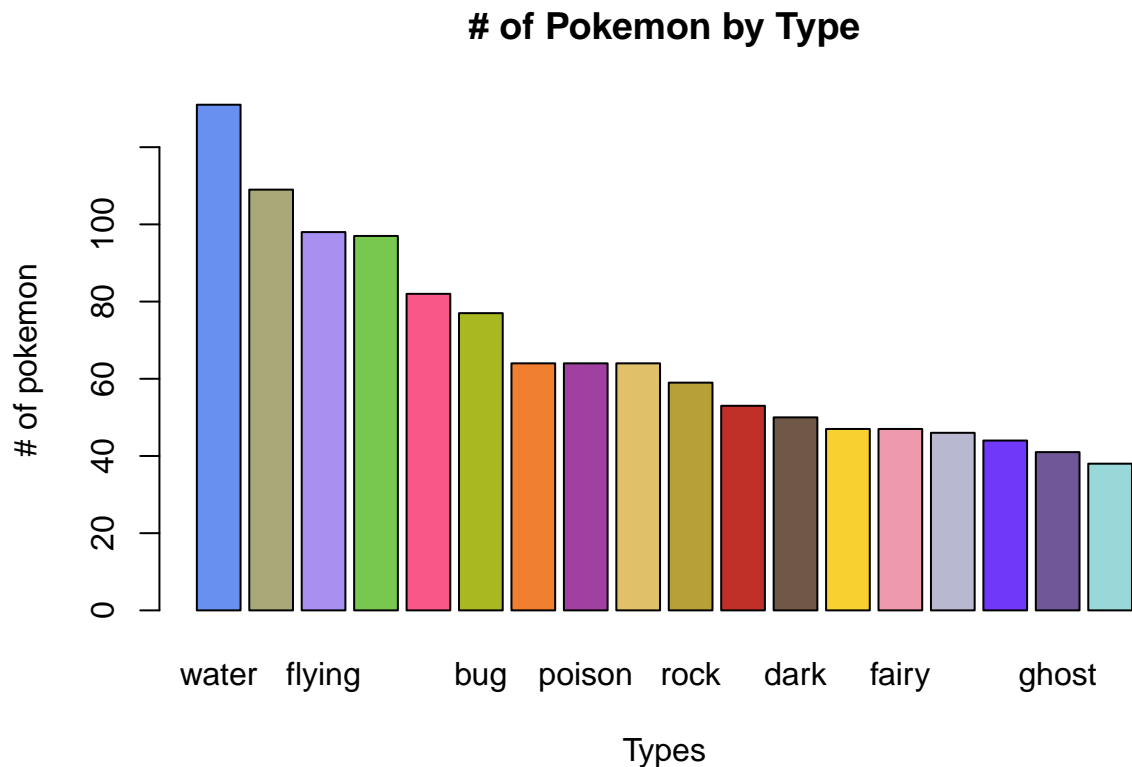
# Pokemon File (Test)

## Pokemon Types and how they Affect Other Characteristics

The goal of this document is to see how the type of Pokemon matters and if all types are treated equally

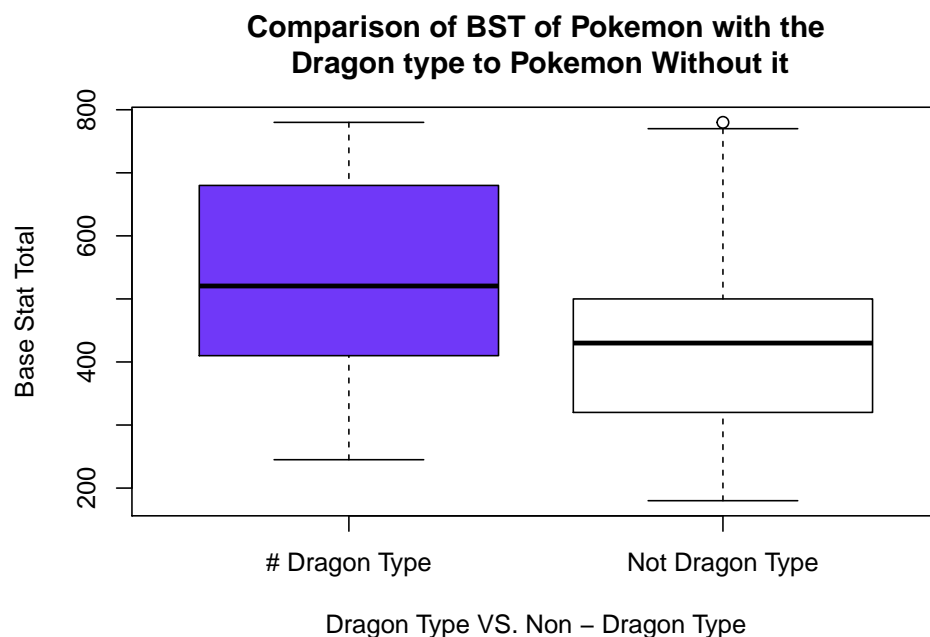
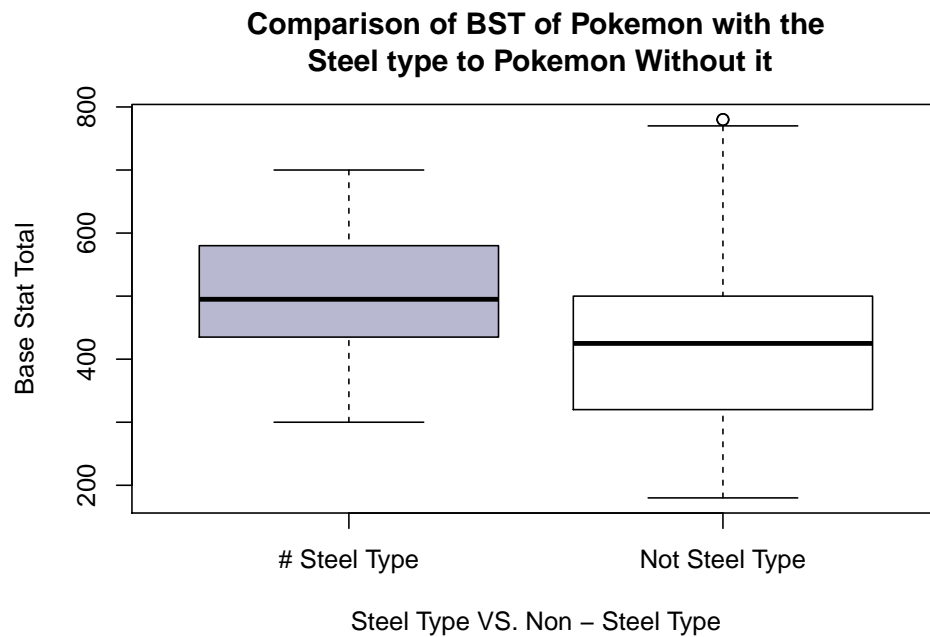
**First Question: How many pokemon are there of each type?** There are many different types in Pokemon such as grass, water, and fire. These types could be analogous to their attribute or what they excel at. Water types excel at using water and so are strong against fire types (Water puts out Fire) and weak against grass (Plants soak up Water). What we want to look at is whether Gamefreak, the makers of Pokemon, split up the types across all pokemon evenly.

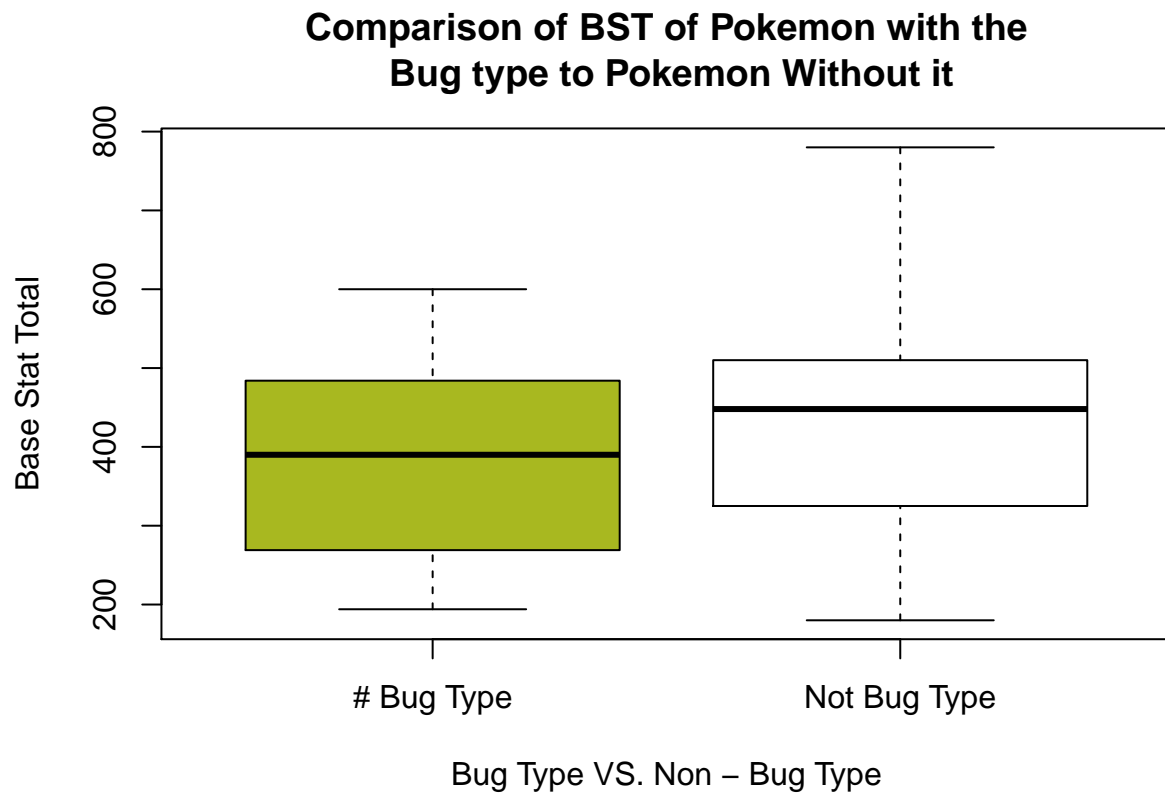
The distribution, counting pokemon with two types twice, once for each type, is as follows:



Here we see there is not an even distribution of pokemon across all the types. The most is of water pokemon and the least is of ice and ghost types. Some reasons could be that every pokemon region (area the game takes place) has an ocean/lake/sea while they don't all have a cemetery or mountain/glacier like region. Also there are only so many variations of a ghost type that could be made limiting design space for unique options.

**Second Question: Is there a correlation between a Pokemon's type and it's Stats?** Every pokemon, like animals, has something they're good at. Cheetahs are fast, gorillas are strong, and turtles are defensive. In pokemon these attributes are called stats and they are as follows: speed, attack, defense, special attack, and special defense. Adding all 5 together forms the Base Stat Total (BST), which is what we are using for the overall strength of each pokemon. Baby pokemon would tend to have lower BST and legendary pokemon would tend to have higher BST. To find a correlation we would have to see the average BST for each type and compare it to the average BST of all pokemon. The following plots show the boxplots of BST for three specific types compared to all pokemon:

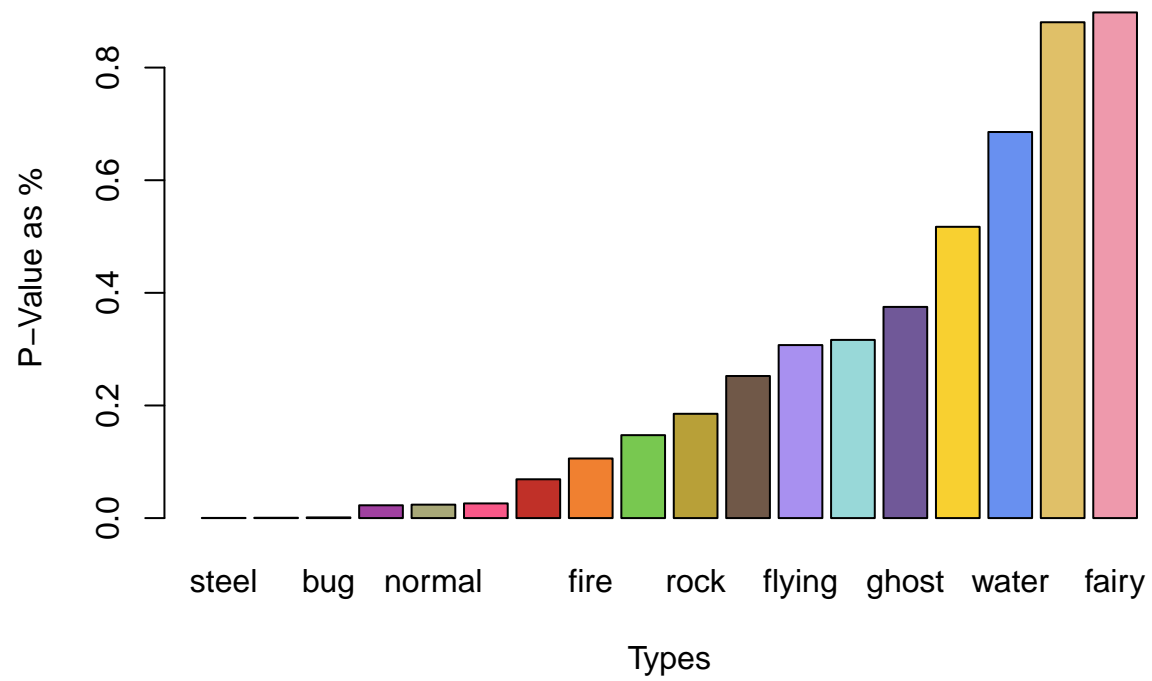




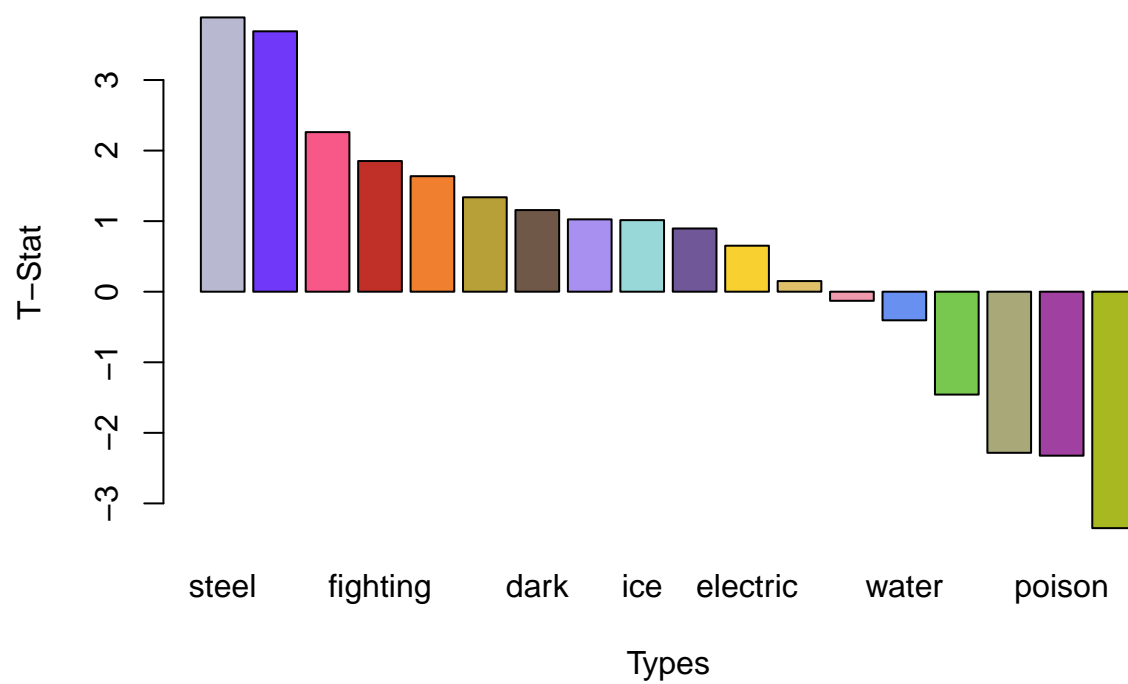
Boxplots show the median not the mean at the center but it's a better way to compare distributions of data while still getting information on the center of data. In this case Steel and Dragon have a median above the distribution of all pokemon while Bug type have a median below the distribution of all Pokemon. Simply, this means dragon types tend to be overstated and bug types tend to be understated relative to all pokemon. Now that we know the type of pokemon has an effect on its Stats, we want to understand how much this effect is for each type.

**Third Question:** Can we quantify this correlation and see if it's statistically significant? In Statistics the question 'how much?' is

**P-Value of 2 sample T test comparing the mean BST of the Individual Type of Pokemon with all Pokemon**



**T-Stat of 2 sample T test comparing the mean BST of the Individual Type of Pokemon with all Pokemon**



**T-Stat of 2 sample T test comparing the mean BST of the Individual Type of Pokemon with all Pokemon Ordered by Absolute Value of T-S**

