About the Data and its Source: This data is obtained from an API off the web that provides information about a very popular game called "The Legends of Zelda: Breath of the Wild" aka "BOTW" (when the game name needs to be referred on later in the report, it will be referred to BOTW). It provides information for the in-game Hyrule Compendium (the encyclopedia inside the game). The API URL that was used to obtain the data is here "https://botw-compendium.herokuapp.com/api/v2". Not all the data was used from the JSON. The total dataset contains a few hundred lines of data, but only a portion of it was extracted and used for the analysis in this report since those are the objectives that I want to focus.

The data was collected and split into 3 separate data frames for this and here's a list of all the attributes and what they mean per each dataframe:

consumables_DF

| FIELD NAME	FIELD DESCRIPTION	FIELD EXAMPLE
name	the name of the consumable item	swift violet
cooking_effect	effect that the consumable item will provide after cooking	speed up
hearts_recovered	hearts (hp) provided after eating the item	0
category	the category of the consumable item such as "food" or "materials"	material
common_locations	common spawn locations of the item	['Gerudo Highlands', 'Hebra Mountains']
description	description of the item	This vitality-rich flower blooms mainly on cliffsides. When cooked into a dish, the nourishing compounds increase your movement speed.
image	image url for this item	https://botw-compendium.herokuapp.com /api/v2/entry/swift_violet/image
id	Compendium id of the item	195

equipment_DF

FIELD NAME	FIELD DESCRIPTION	FIELD EXAMPLE
name	the name of the equipment	great flameblade
attack	attack value of the equipment	34
defense	defense value of the equipment	0
common_locations	common spawn locations of the item	['Hyrule Field', 'Eldin Canyon']
description	description of the item	This magic-infused greatsword was forged in the fires of Death Mountain by Goron smiths in an ancient age. Attack when the blade glows red to expel flames
image	image url for this item	https://botw-compendium.herokuapp.com /api/v2/entry/great_flameblade/image
id	compendium id of the item	268

mob_DF

FIELD NAME	FIELD DESCRIPTION	FIELD EXAMPLE
name	the name of the monster	water octorok
drops	what the monsters drop after defeated	['octorok tentacle', 'octo balloon', 'octorok eyeball']
common_locations	common spawn locations of the monster	['West Necluda', 'Hyrule Field']
description	description of the monster	Although they spend most of their time in water, the drop in barometric pressure that occurs when it rains causes an air sac within these octopus-like monsters to inflate and lift them into the air. The rocks they spit out can be bounced back with a shield
image	image url for this monster	https://botw-compendium.herokuapp.com /api/v2/entry/water_octorok/image
id	compendium id of the monster	92

An example of the in-game compendium taken from my game for a monster is listed below:
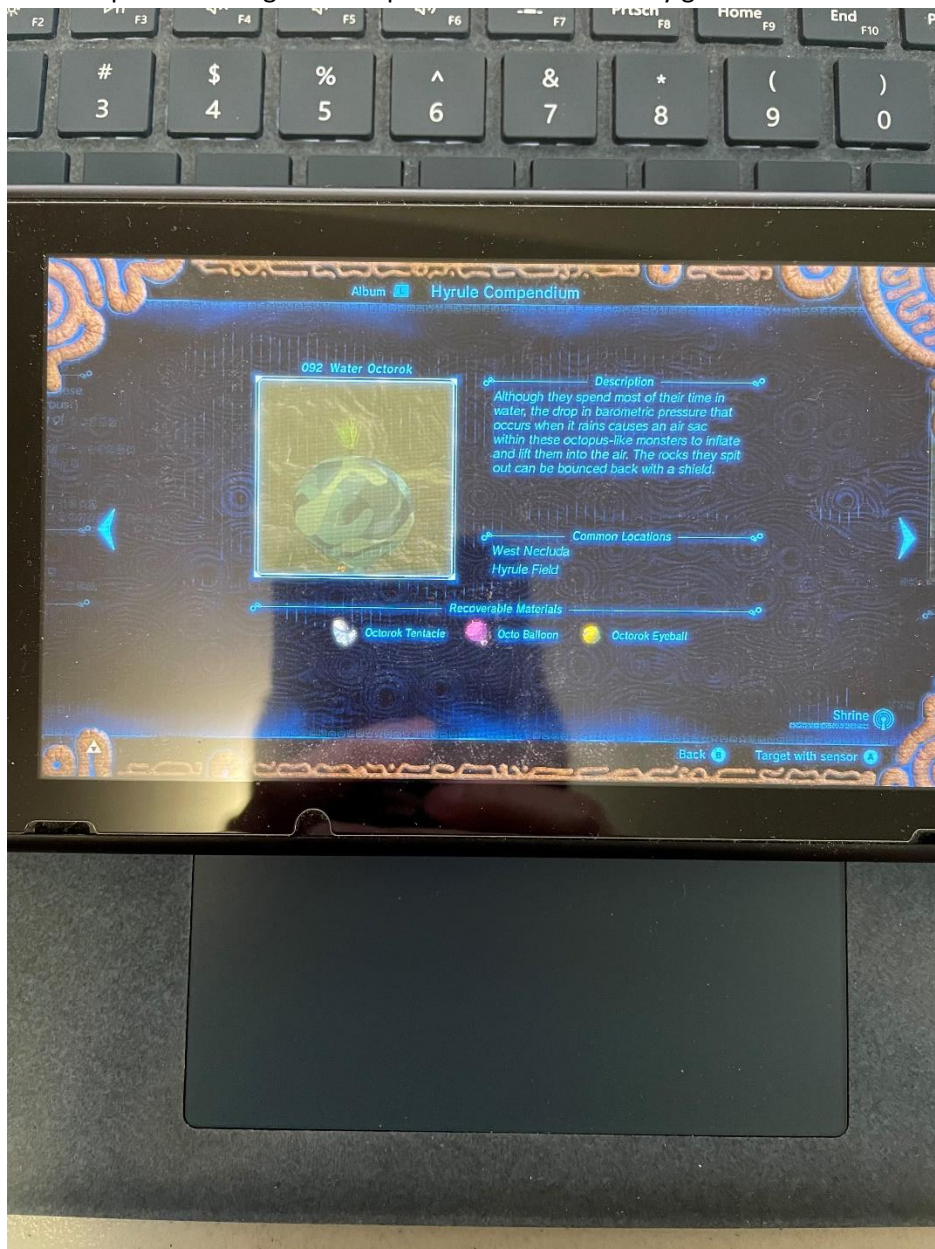
NOTE: This is only for the Monsters section of the Compendium. The other sections for would look a little different depending on their categories. If you are interested and want to see how the other sections of the compendium would look like, just Google "hyrule compendium botw" and the information about would pop up and also have more context than this report.

Data Exploration & Data Cleaning: The JSON data that was collected from the API for BOTW is actually very clean. There wasn't much cleaning needed on my end to make the data itself usable. Since the JSON information is easily accessible for visualizing with a JSON viewer online, I had to browse through it to make sure I was entering the proper fields to collect the information. The data itself has some blank values in it, but it is intentional. As a veteran player of the game, it is reasonable as to why there are blanks. An example for the common locations of some equipment, it would be left blank because those items are either really rare, obtainable via purchasing from an NPC (Non-playable character), or a quest item that isn't permanent for keeping.

Due to my abundance knowledge I have for BOTW, all the information here is accurate to its nature. The analysis that will be conducted will be using the numeric fields such as attack values or hearts recovered, and those don't have any blank values, making it very easy to work with.

Once the specific sections were identified within the JSON data, a few functions were written to keep the code a bit cleaner to extract and split the JSON data into 3 separate data frames for further analysis, creating:

- consumables_DF
- equipment_DF
- mob_DF

The data is now all loaded in and ready for analysis.

Data Analysis

The analyses will be split into 3 parts since there are 3 dataframes that were split from the original data.

Q1: How many items have attack points greater than 30? What are they? Where are they? What's the median atk value for all the weapons?

Unit of analysis: attack values

Comparison: For each equipment in the game, filter out all equipment that have an attack value of over 30, and count how many weapons that meets this requirement. Find the median value for all weapons

Output: Print out a message of the count for weapons greater than 30 atk points and the total amount of weapons. Print out the message that tells the user the median. Display all the weapons that have an attack of greater than 30 and their common locations.

```
There are 35 weapons out of 148 greater than 30. Here's their information:

The median out of all the weapons is: 16.0
+-----+------------------------+--------+-------------------------------------------+
|     | name                   | attack | common_locations                          |
+-----+------------------------+--------+-------------------------------------------+
|   8 | royal guard's spear    |   32   |                                           |
| 168 | scimitar of the seven  |   32   | ['Gerudo Town']                           |
|  20 | great thunderblade     |   32   | ['Hyrule Field', 'Tabantha Frontier']     |
| 102 | eightfold longblade    |   32   | ['West Necluda', 'Lanayru Great Spring']  |
|  46 | savage lynel bow        |   32   | ['Hebra Mountains', 'Hyrule Field']       |
| 121 | great flameblade       |   34   | ['Hyrule Field', 'Eldin Canyon']          |
| 155 | steel lizal bow        |   36   | ['Hebra Mountains', 'Akkala Highlands']   |
|  89 | royal broadsword       |   36   | ['Tabantha Frontier', 'Akkala Highlands'] |
|  83 | lynel crusher          |   36   | ['Gerudo Highlands', 'Tabantha Frontier'] |
| 112 | mighty lynel sword     |   36   | ['Hyrule Field', 'Lanayru Great Spring']  |
|  57 | dragonbone boko bat    |   36   | ['Hyrule Ridge', 'Necluda Sea']           |
|  44 | lizal tri-boomerang    |   36   | ['Hebra Mountains', 'Akkala Highlands']   |
| 182 | knight's claymore      |   38   | ['Gerudo Desert', 'Tabantha Frontier']    |
| 167 | royal bow              |   38   | ['Tabantha Frontier', 'Hebra Mountains']  |
|  31 | windcleaver            |   40   | ['Gerudo Highlands', 'West Necluda']      |
| 152 | ancient short sword    |   40   |                                           |
| 120 | demon carver           |   40   |                                           |
| 134 | guardian sword++       |   40   | ['Hebra Mountains', 'Akkala Highlands']   |
| 177 | stone smasher          |   42   | ['Eldin Canyon', 'Hyrule Field']          |
| 162 | ancient bow            |   44   |                                           |
| 117 | ancient battle axe+    |   45   | ['Akkala Highlands', 'Hyrule Field']      |
| 144 | dragonbone moblin club |   45   | ['Hebra Mountains', 'Eldin Mountains']    |
|  35 | royal guard's sword    |   48   |                                           |
| 116 | edge of duality        |   50   | ['Hyrule Field', 'West Necluda']          |
|  64 | royal guard's bow      |   50   |                                           |
|  87 | royal claymore         |   52   | ['Tabantha Frontier', 'Gerudo Desert']    |
|  72 | mighty lynel crusher   |   54   | ['Gerudo Highlands', 'Hebra Mountains']   |
| 173 | ancient bladesaw       |   55   |                                           |
|  78 | savage lynel sword     |   58   | ['Hyrule Field', 'Hebra Mountains']       |
|  63 | ancient battle axe++   |   60   | ['Hebra Mountains', 'Gerudo Highlands']   |
|  58 | boulder breaker        |   60   | ['Eldin Canyon']                          |
| 143 | royal guard's claymore |   72   |                                           |
| 142 | savage lynel crusher   |   78   | ['Hebra Mountains', 'Eldin Mountains']    |
|  13 | bow of light           |  100   |                                           |
| 150 | one-hit obliterator    |  1e+09 |                                           |
+-----+------------------------+--------+-------------------------------------------+
```

As mentioned earlier, the blank values caused by the common_locations is due to the any one of the 3 reasons listed above so it's reasonable that it would show up like this. It's crazy to see that about a 1/5 of weapons are only above the attack value of 30. Even a BOTW veteran like me didn't know about this until now. The median attack value is only 16 which means most of the weapons are very low damage and probably the reason I avoided picking up and using most weapons unless they are on the list here. The attack value for the one-hit obliterator isn't an error. That's the actual attack value of it, since the name is quite literal (one-hit obliterator will obliterate things in one-hit).

Q2: What's the mean, median, and mode for materials that's used for healing purposes? How about for the ones above a certain hp recovery threshold?

Unit of analysis: hearts recovered

Comparison: For all consumable items that can provide hp recovery, find the central tendency for the hearts that can be recovered for those items.

Output: Output the mean, median, and mode for the different threshold at hp recovered >0 and hp recovered >1.


```
DF_name      consumables_DF
mean               1.60638
median                   1
mode                     1
Name: 0, dtype: object
```
HP > 0
```
DF_name      consumables_DF
mean                  4.75
median                   3
mode                     2
Name: 0, dtype: object
```
HP > 1

It can be seen that there are a lot of items that can provide hp recovery in the game itself, however most of them provide only a miniscule amount of providing only 1 heart (given the median and mode). After setting the threshold at hp recovered >1 to look at more items that can recover hp in the game, it looks like there are actually a lot of consumables out there that can help recover a larger amount of hp as proven by the median and mean. Despite that all the hp recovery items only recover 1 heart, it's worth taking the time to avoiding those and getting higher quality consumables.

Q3: What are the monster drops for Moblins, Lizalfos, Octoroks, and some common locations they are in?

Unit of analysis: name (species of monsters)

Comparison: Filter out the monster dataframe by those specific monster species and compare their drops and common locations

Output: Output the name, drops, and some common spawn locations of the monster species (Moblins, Lizalfos, and Octoroks)

```
+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+
|    | name           | drops                                                                       | common_locations                          |
+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+
|  3 | stalmoblin     | ['moblin horn', 'moblin fang']                                              | ['Great Hyrule Forest', 'Gerudo Highlands']|
|  6 | moblin         | ['moblin horn', 'moblin fang']                                             | ['Hyrule Field', 'East Necluda']          |
| 10 | cursed moblin  | []                                                                          |                                           |
| 11 | black moblin   | ['moblin horn', 'moblin fang', 'moblin guts']                              | ['Hyrule Field', 'Eldin Canyon']          |
| 15 | blue moblin    | ['moblin horn', 'moblin fang', 'moblin guts']                             | ['Hyrule Field', 'Deep Akkala']           |
| 58 | silver moblin  | ['moblin horn', 'moblin fang', 'moblin guts', 'amber', 'opal', 'topaz', 'ruby', 'sapphire', 'diamond'] |    |
+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+

+----+---------------------+-----------------------------------------------------------------------------+-------------------------------------------+
|    | name                | drops                                                                       | common_locations                          |
+----+---------------------+-----------------------------------------------------------------------------+-------------------------------------------+
|  0 | silver lizalfos     | ['lizalfos horn', 'lizalfos talon', 'lizalfos tail', 'amber', 'opal', 'topaz', 'ruby', 'sapphire', 'diamond'] |       |
| 13 | black lizalfos      | ['lizalfos horn', 'lizalfos talon', 'lizalfos tail']                       | ['Hyrule Field', 'Hebra Mountains']       |
| 34 | ice-breath lizalfos | ['lizalfos horn', 'lizalfos talon', 'icy lizalfos tail']                  | ['Gerudo Highlands', 'Hebra Mountains']   |
| 48 | stalizalfos         | ['lizalfos horn', 'lizalfos talon']                                        | ['Gerudo Desert', 'Hyrule Ridge']         |
| 55 | electric lizalfos   | ['lizalfos horn', 'lizalfos tail', 'yellow lizalfos tail']                | ['Gerudo Desert', 'Hyrule Ridge']         |
| 57 | blue lizalfos       | ['lizalfos horn', 'lizalfos talon', 'lizalfos tail']                      | ['Tabantha Frontier', 'Gerudo Desert']    |
| 60 | lizalfos            | ['lizalfos horn', 'lizalfos talon']                                        | ['Lanayru Great Spring', 'Gerudo Desert'] |
| 65 | cursed lizalfos     | []                                                                          |                                           |
| 76 | fire-breath lizalfos| ['lizalfos horn', 'lizalfos talon', 'red lizalfos tail']                  | ['Eldin Canyon', 'Gerudo Desert']         |
+----+---------------------+-----------------------------------------------------------------------------+-------------------------------------------+

+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+
|    | name           | drops                                                                       | common_locations                          |
+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+
|  1 | rock octorok   | ['octorok tentacle', 'octo balloon', 'octorok eyeball']                    | ['Eldin Canyon', 'Gerudo Highlands']      |
| 25 | snow octorok   | ['octorok tentacle', 'octo balloon', 'octorok eyeball']                    | ['Gerudo Highlands', 'Tabantha Frontier'] |
| 45 | forest octorok | ['octorok tentacle', 'octo balloon', 'octorok eyeball']                    | ['Hyrule Ridge', 'Deep Akkala']           |
| 78 | treasure octorok| ['octorok tentacle', 'octo balloon', 'octorok eyeball', 'green rupee', 'blue rupee', 'red rupee', 'purple rupee', 'silver rupee'] | ['Gerudo Highlands', 'Gerudo Desert'] |
| 80 | water octorok  | ['octorok tentacle', 'octo balloon', 'octorok eyeball']                    | ['West Necluda', 'Hyrule Field']          |
+----+----------------+-----------------------------------------------------------------------------+-------------------------------------------+
```

Personally I've noticed that the game doesn't have a lot of "silver" enemies around, and after seeing that the common location is blank for that those monsters it means that those are rare in the game and I would actively need to look out for it in order to hunt down them down for their gemstone (diamond, ruby, topaz, etc.) drops. Another interesting thing is that some of their drops vary a bit depending on their color. I always thought regular moblins would drop a moblin gut and was actively hunting them down for it, but it turns out I was wrong this whole time, proven by this output.

How the Program works

The program first reaches the API that houses all this data and retrieves it off the web. If it doesn't reach the web because the API might be down or the internet of the user is down, it will tell the user that there's an error and for them to try again later. If the API can be accessed successfully, then it will be converted into a JSON format for the program to conduct further analysis of it. Then the functions, written to collect specific categories of the data, were called to create the 3 separate data frames from that JSON data. Depending on the type of information in the specific dataframes and the questions that needed to be answered, new filtered out dataframes were created within specific functions. Those new filtered dataframes will then be returned by the function itself and be displayed in a nicer format with the use of the tabulate module.

Final Conclusion

The game doesn't have that many strong weapons since the median attack value of the weapon is only 16. I also noticed that this is also the reason why I don't a lot of items that have at least 30 attack values in my arsenal.

It's interesting to see that most consumable items in the game will recover only 1 heart, but if I really looked hard enough I would be able stumble upon some higher hp recovery consumables that can provide 3 or 4 hearts.

Furthermore, the regular monsters in this game doesn't drop some of the rarer items when comparing to monsters that are in blue, black, and silver colors. Silver enemies are also a lot rarer and doesn't have a common spawn location, which makes farming gemstones from them a lot harder.

Overall, this program was very fun to make since the intention was to know more about BOTW. This game contains so many different aspects of it and this program only touches a little part of it. I am looking to complete my game 100% and that includes finding every single item on the Hyrule compendium in the game and taking a picture of it in the game, so this program will help a bit with that with the common location aspects of it.