Basic Information

Project Title: D&D Monster Statistics

Team members:

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Repository: https://github.com/fordahalibut/4630-project

Background and Motivation

I'm an avid D&D player and longtime dungeon master and have often bemoaned to my friend group that there isn't a good way to visualize important monster statistics (such as hit points, challenge rating, type, damage vulnerabilities or resistances) when designing encounters.

Project Objectives

Imagine that the party of player characters is travelling through a swamp. As a dungeon master, I know that the party's fighter can easily keep the attention of one large, challenging creature while the rest of the group attacks from relative safety. I know the sorcerer prefers to use spells that deal fire damage, and that the cleric can make swift work of any undead, but he's been feeling a little underutilized lately, so he needs a moment to feel special. I want to design an encounter that will challenge the group and set up a heroic scene for the cleric.

The goal of this visualization is to assist the dungeon master in this situation. Rather than flipping through sourcebooks or tables of monster data, they should be able to first filter to monsters of interest (undead creatures that live in swamps), and then display the relevant statistics of those monsters (in this case, challenge rating, size, and damage resistances).

By seeing this data represented in a visualization, they should be more easily able to design the desired encounter.

Data

The 5th Edition System Reference Document (SRD) is available from Wizards of the Coast through the Open Gaming License and contains the relevant statistics for several hundred monsters. There are several sites dedicated to displaying the data in this document, but none that I have found effectively visualize the data.

I plan to make use of www.dnd5eapi.co, which serves JSON results to RESTful queries made. By writing a short Python script to access the API, I should be able to get the data in an easily usable format.

In addition to the SRD, I have access to digital copies of sourcebooks I've previously purchased which contain an expanded list of monsters. I'll investigate scraping these digital books to increase the size of the dataset as a stretch goal.

Data Processing

I do not anticipate needing substantial data cleanup, as information retrieved through the API should be well structured and free of missing values. More work will need to be done if I expand the dataset with data scraped from the digital sourcebooks.

Derived data will depend on how thoroughly I can implement an actual encounter builder which would require input from the user. These fields could include:

- **Encounter difficulty –** This is a function of the number of player characters and their level, versus the number of enemies and their challenge rating.
- **Encounter type –** Should there be a horde of weaker enemies? A few stronger ones? One very powerful monster with its minions?

There would need to be an element of randomization involved in an encounter builder.

Visualization Design

The main components in this visualization are:

- Overview of selected statistics (scatter plot?)
- Detailed view of a selected creature
- Table display summary

(See included prototype designs)

In iterating through multiple design prototypes, I realized that the most interesting visual element will be the detailed view of a particular selected monster. I tried to encode the most relevant and useful information in such a way to be easily digestible at a glance, to see where particular strengths and weaknesses of an individual monster are.

Including the encounter builder idea is interesting technically and would be very useful in practice, however, it lies somewhat outside the scope of a project focused on visualization.

Must-Have Features

- A visualization of selected monster statistics with:
    - Variable axes depending on desired comparison
    - Selectable data points that would populate the detailed view
- A detailed view of a selected monster
    - Visualization of detailed statistics
- A filterable, sortable table view of monsters fitting the selected criteria

Optional Features

- An encounter builder which collects needed input from the user and suggests a randomized encounter comprised of monsters that fit the selected criteria.
    - Ideally would serve several options across a range of difficulties

Project Schedule

- Week 1 (10/28):
    - API data collected, investigated feasibility of scraping additional records from digital sourcebooks

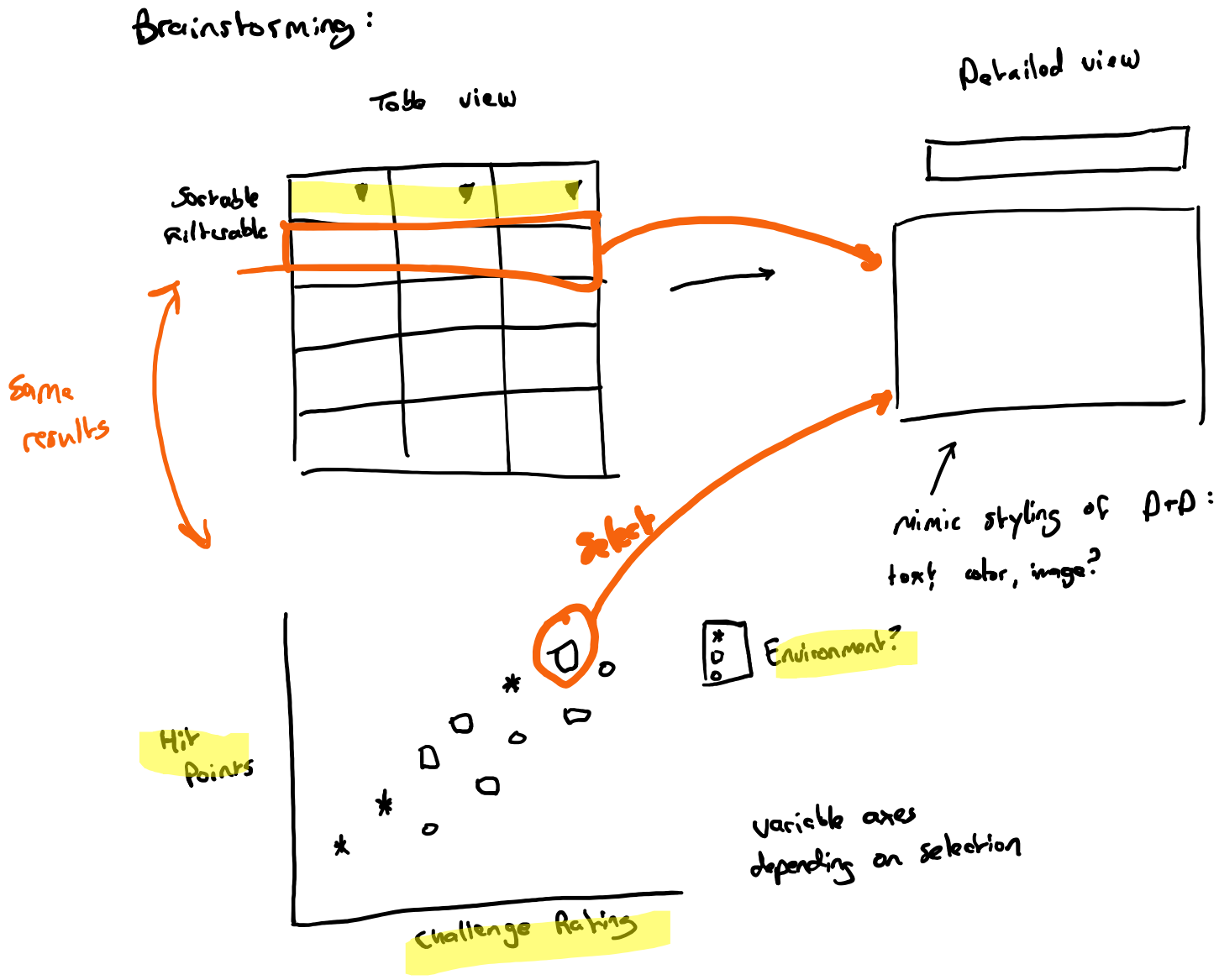
- Week 2 (11/4):
    - Final dataset obtained and cleaned (if necessary)
    - Skeleton of web interface built

- Week 3 (11/11): **Milestone submission**
    - Basic visualization components all created
    - Go / No go decision on encounter builder component

- Week 4 - 5 (11/25):
    - Interactions built:
        - Overall visualization to detailed view
        - Table display, sorting and filtering
    - Encounter builder input and output elements
    - Website published

- Week 6 (12/2):
    - Finalized encounter builder
    - Project write up and presentation

Prototype Designs



Detailed View:

Name

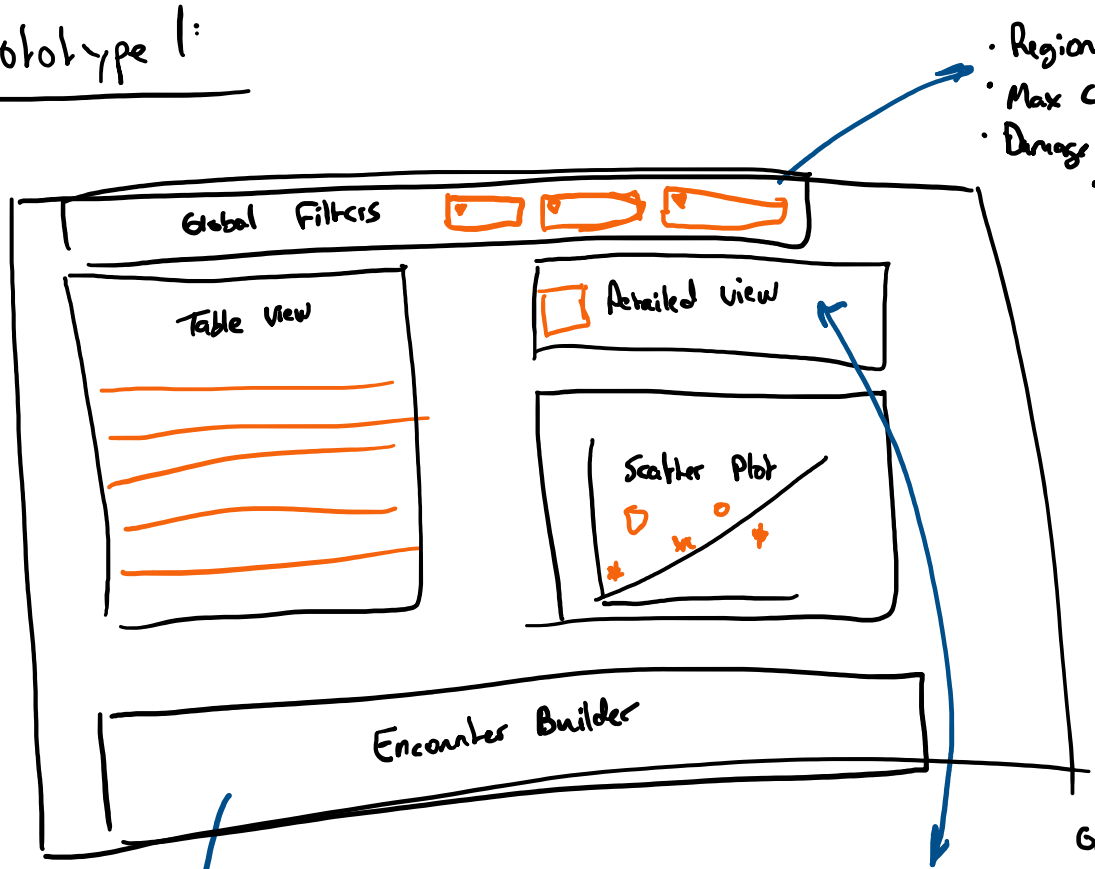
Image?

Summary:
- HP
- CR
- Size
- Legendary
- Mythic
- attack bonus?

Visualize:
1. Resistance
2. Immunity
3. Vulnerability

Damage Type / condition

Prototype 1:



- Region / Environment
- Max CR
- Damage vuln / resist / immune?
  - Multi select

Gradient scale instead?

Damage Type

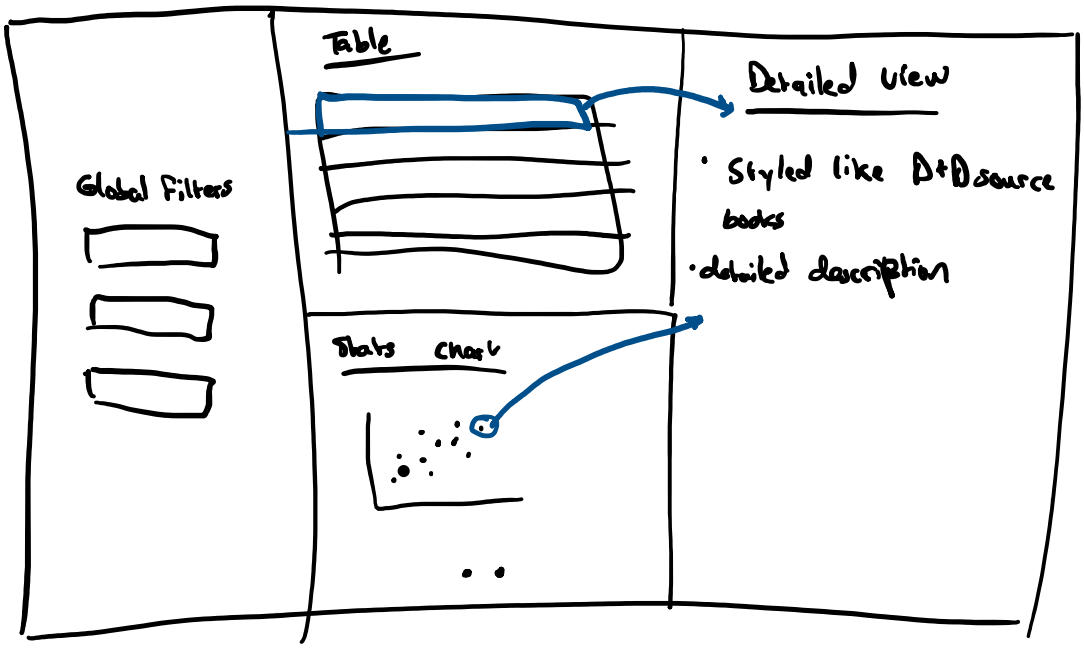
- Vulnerable
- resistant
- immune

- Input Prompts
- Output table:
  - rows represent monster

How to visualize stat comparison in a more interesting way?

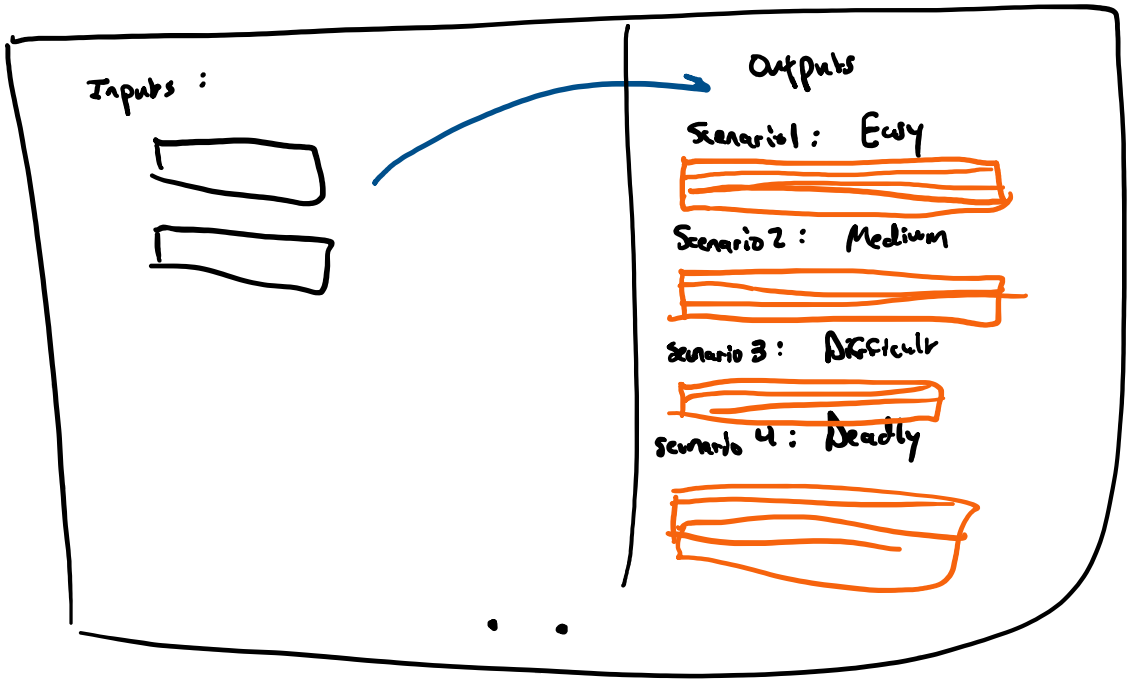
Prototype 2:

Page 1: Display Stats

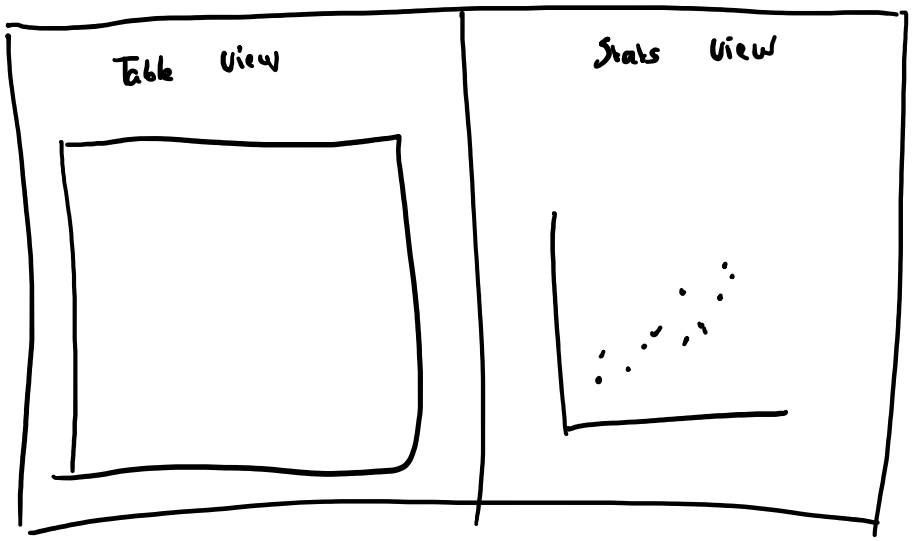


• selection feeds detailed view

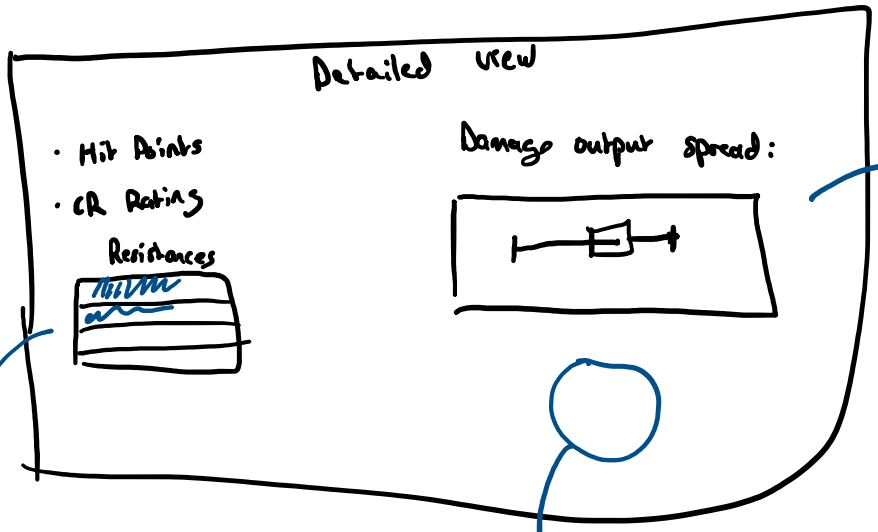
Page 2: Encounter Builder



Prototype 3:

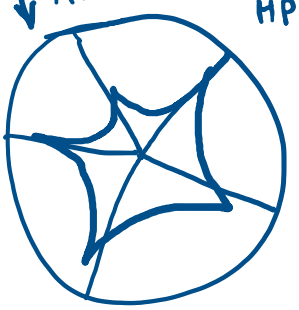


Scroll down



Per round, each attack type. Might require more data than available in API.

Gradient heatmap

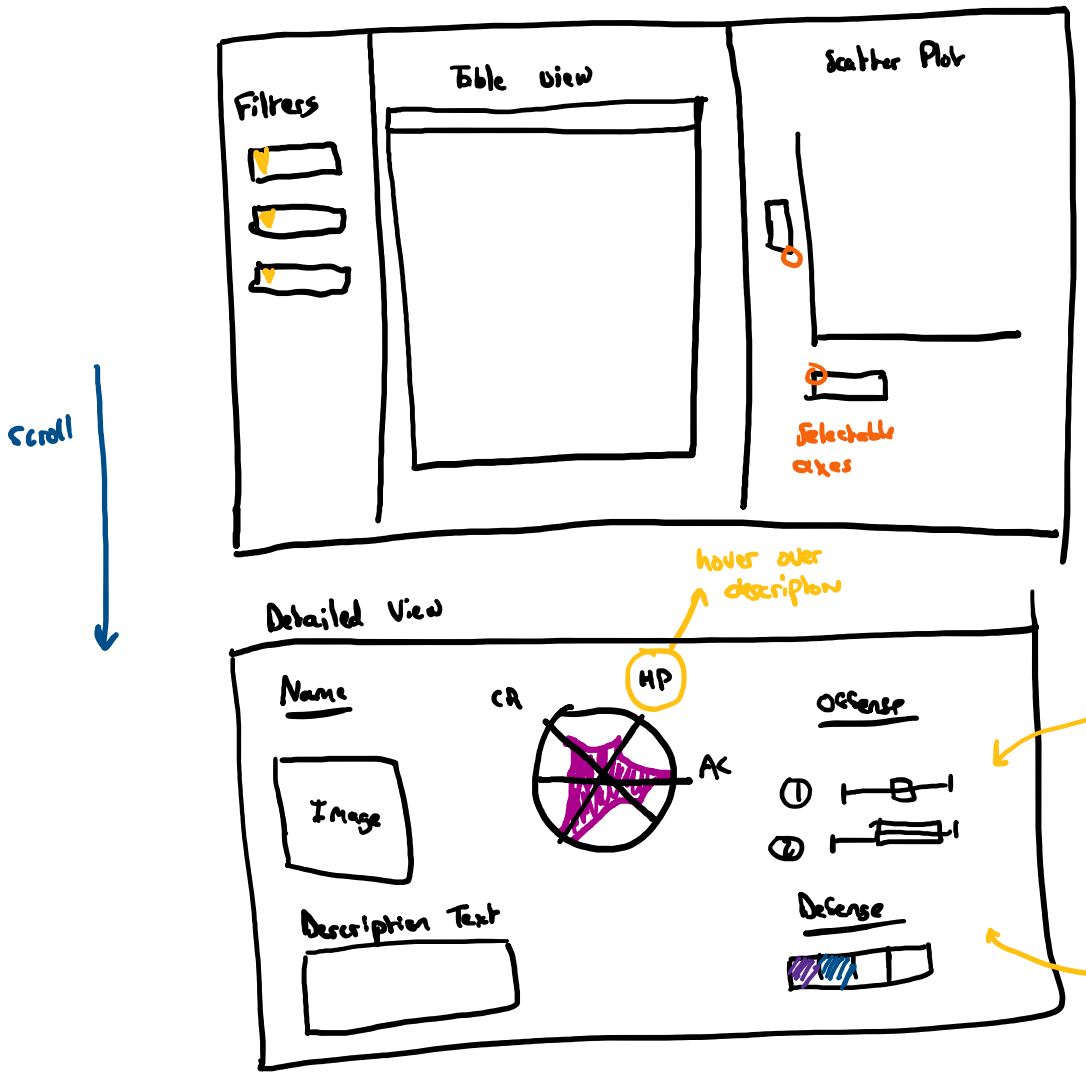


Damage Potential
- requires calculation + assignment
- condense to "offence" stat?

\+ More interesting to focus on the detailed view

\- more derived data - more processing, somewhat arbitrary assignment

Design Prototype:



- Encoded stats in:
  - Numerical: position
  - Categorical: shape / color

- Encoded detailed statistics in
  - Radial area chart:
    - shows areas of strength and weakness
  - Bar chart:
    - shows predicted distribution of damage output
  - Heat Map
    - Easily digestible - at a glance see what immunities / vuln / resistances