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.

To collect the data, I made use of www.dnd5eapi.co, to generate a JSON file from a REST query. The resulting file contains 334 5th edition monsters and their associated attributes and statistics.

Exploratory Data Analysis

After obtaining the base data from the 5e SRD API, I began by designing the sortable table view to check expected versus actual values. I then created a rough scatter plot to visualize different numeric values against each other to see how the planned visual design would look.

Visualization Design

The main components in this visualization are:

- Table display of filtered results
- Overview of selected statistics (scatter plot)
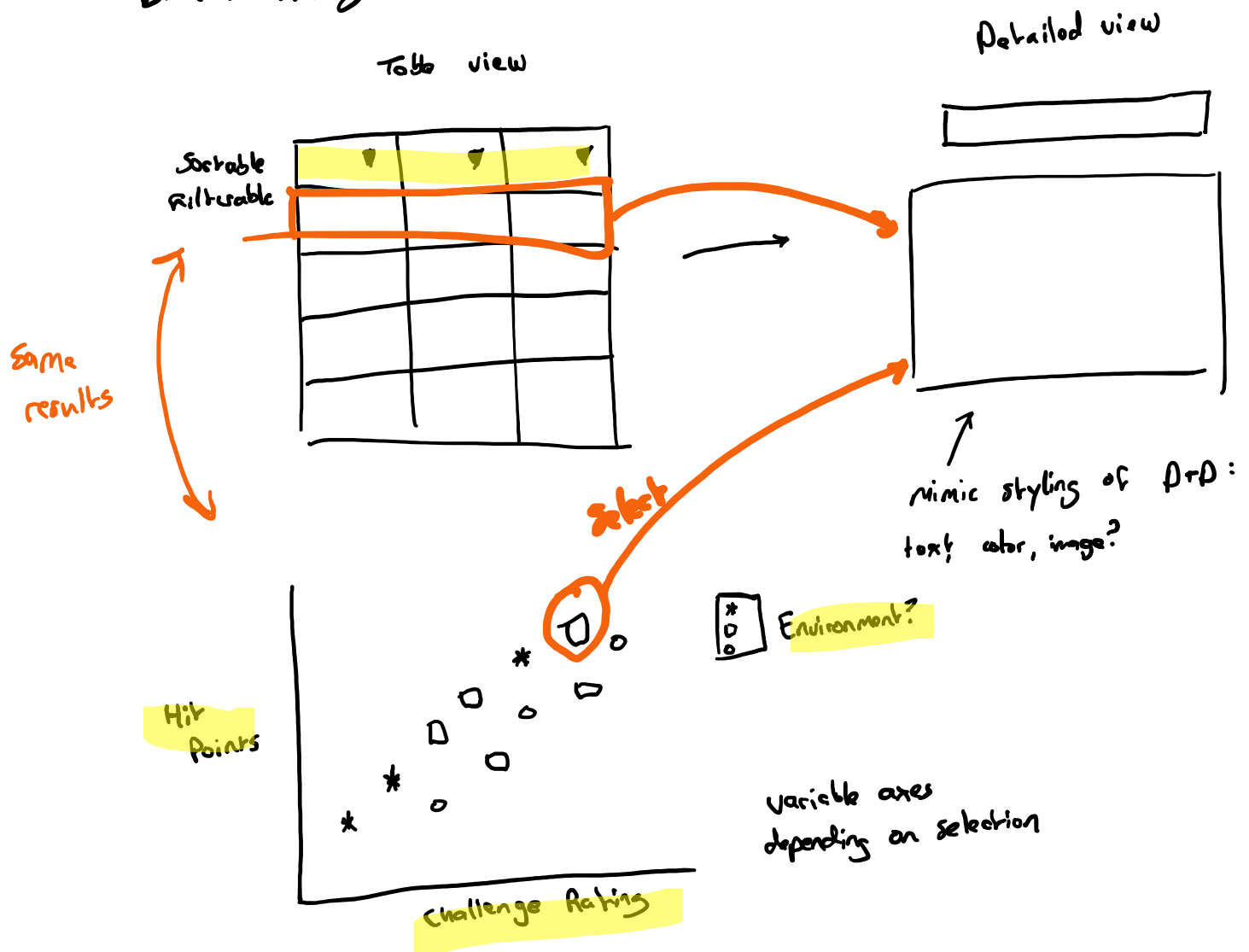- Detailed view of a selected creature

(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.
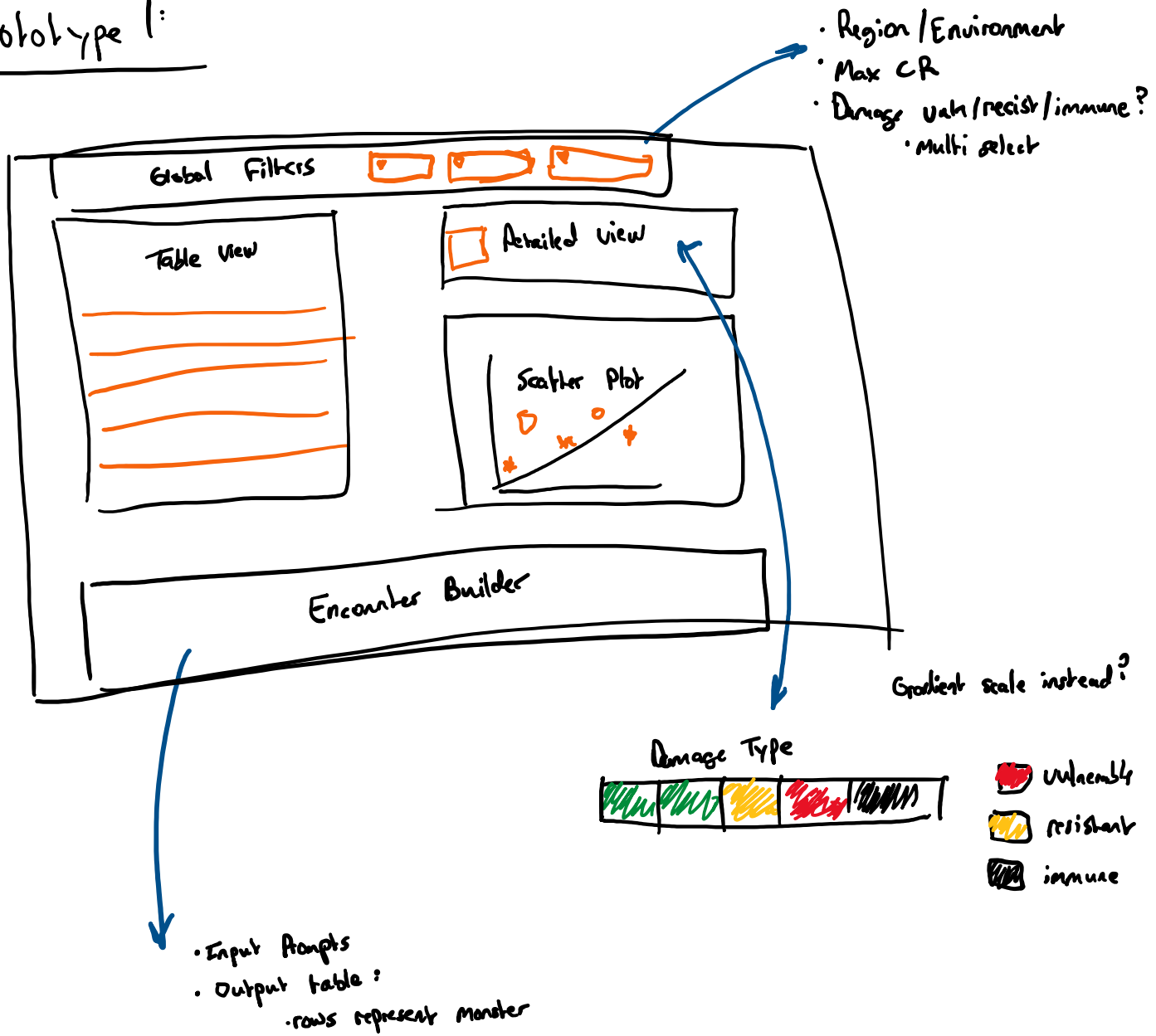
Prototype Designs

Brainstorming:

Toble view

Detailed view

Sortable
Filterable

Same
results

Select

mimic styling of DnD:
text color, image?

Environment?

Hit
Points

Variable axes
depending on selection

Challenge Rating

Detailed View:

Name

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

image?

Visualize:
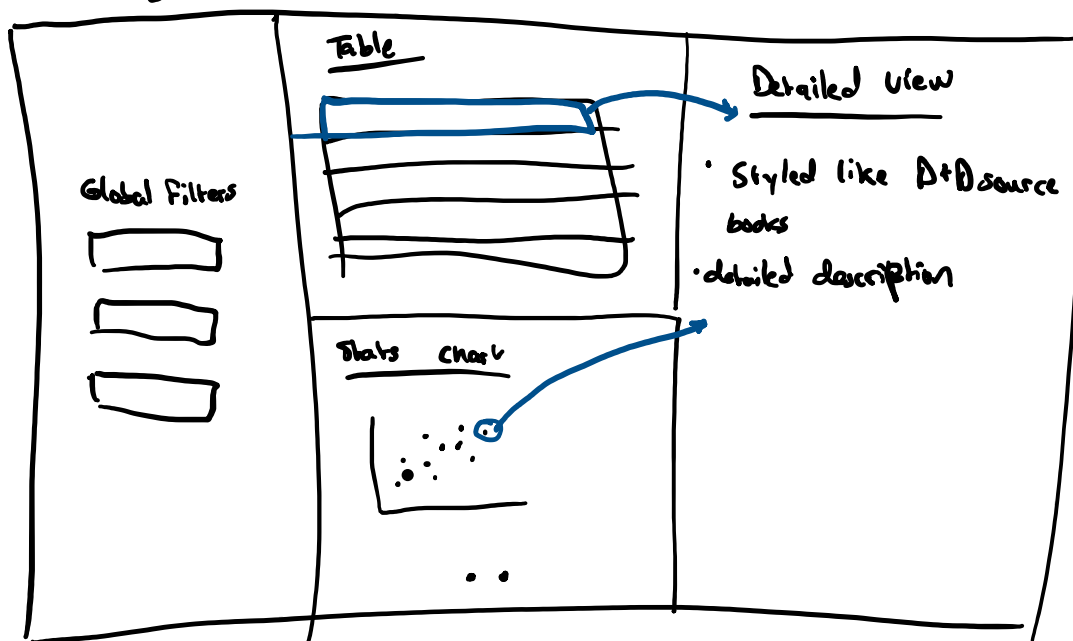- Resistance
- Immunity
- Vulnerability

Damage Type / condition

Prototype 1:

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

Global Filters

Table View

Detailed View

Scatter Plot

Encounter Builder

- Input Prompts
- Output table:
  - rows represent monster

Gradient scale instead?

Damage Type

🟥 vulnerable

🟨 resistant

⬛ immune

💲 How to visualize stat comparison in a more interesting way?

Prototype 2:

Page 1: Display Stats

Global Filters

Table

Detailed View

- Styled like D+D source books
- detailed description

Stats Chart

· Selection feeds detailed view

Page 2: Encounter Builder

Inputs:

Outputs

Scenario 1: Easy

Scenario 2: Medium

Scenario 3: Difficult

Scenario 4: Deadly

Prototype 3:

Table View

Stats View

Scroll down

Detailed View

- Hit Points
- CR Rating

Resistances

Gradient heatmap

Damage output spread:
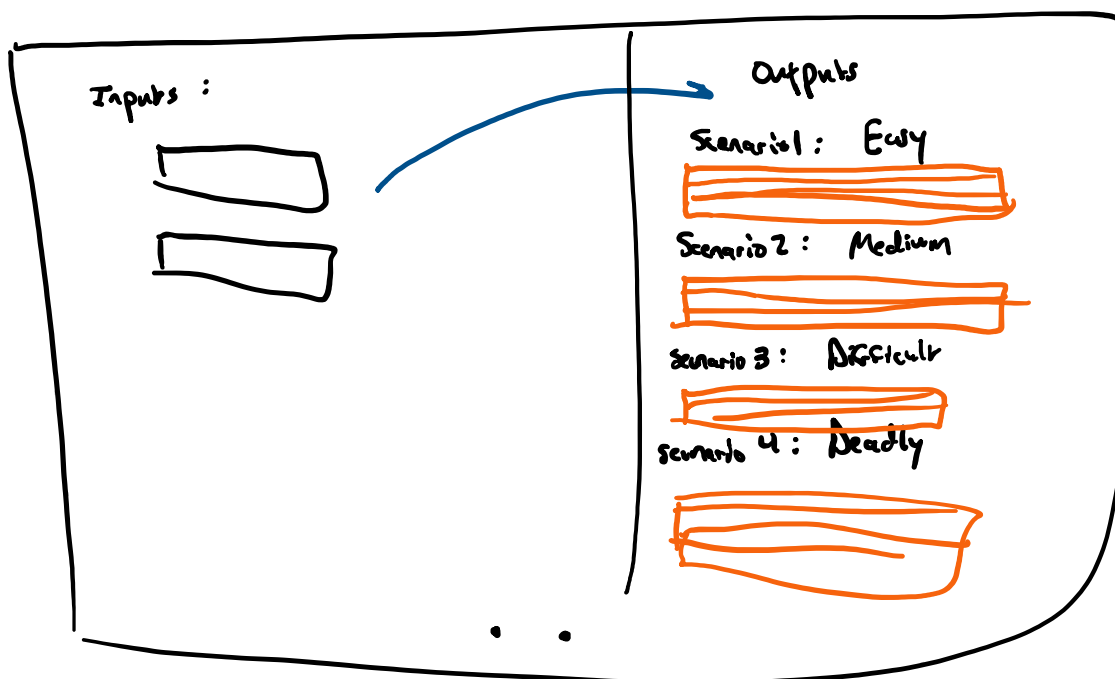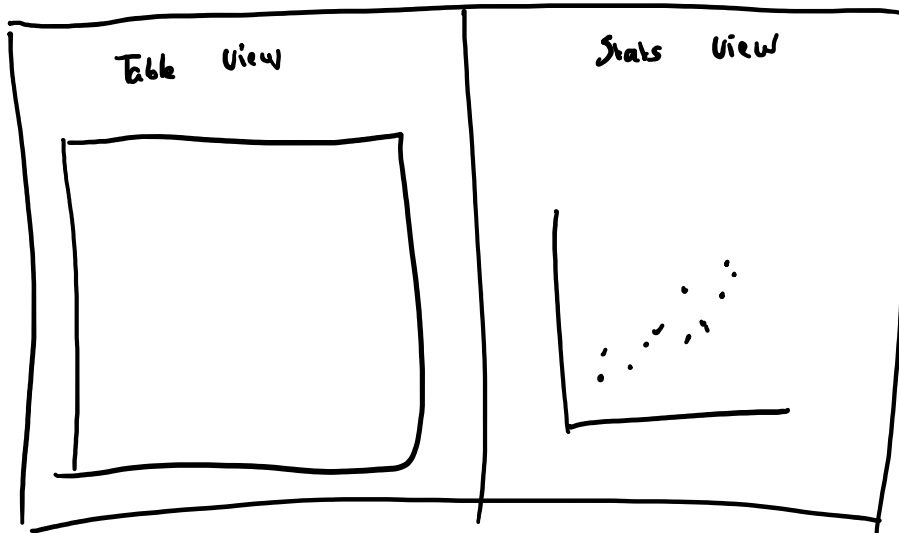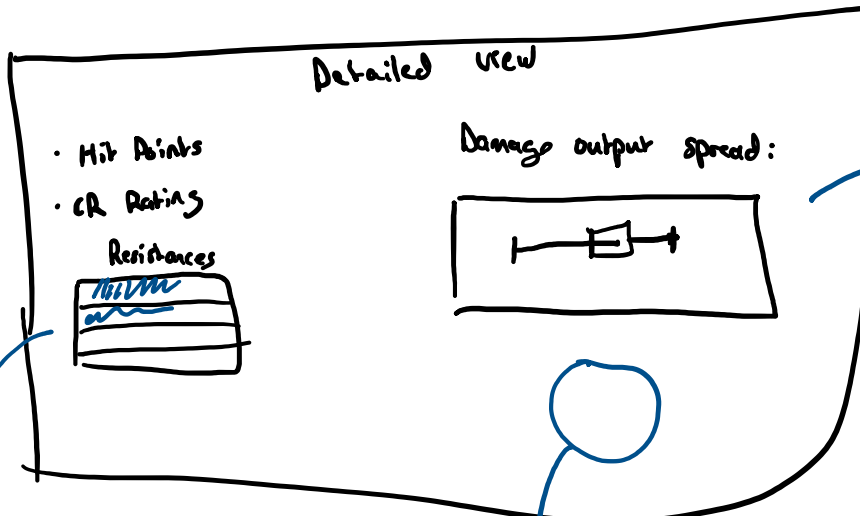
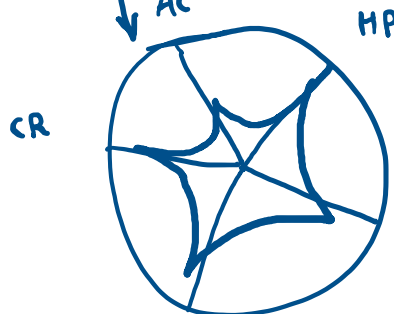Per round, each attack type. Might require more data than available in API.

AC

HP

CR

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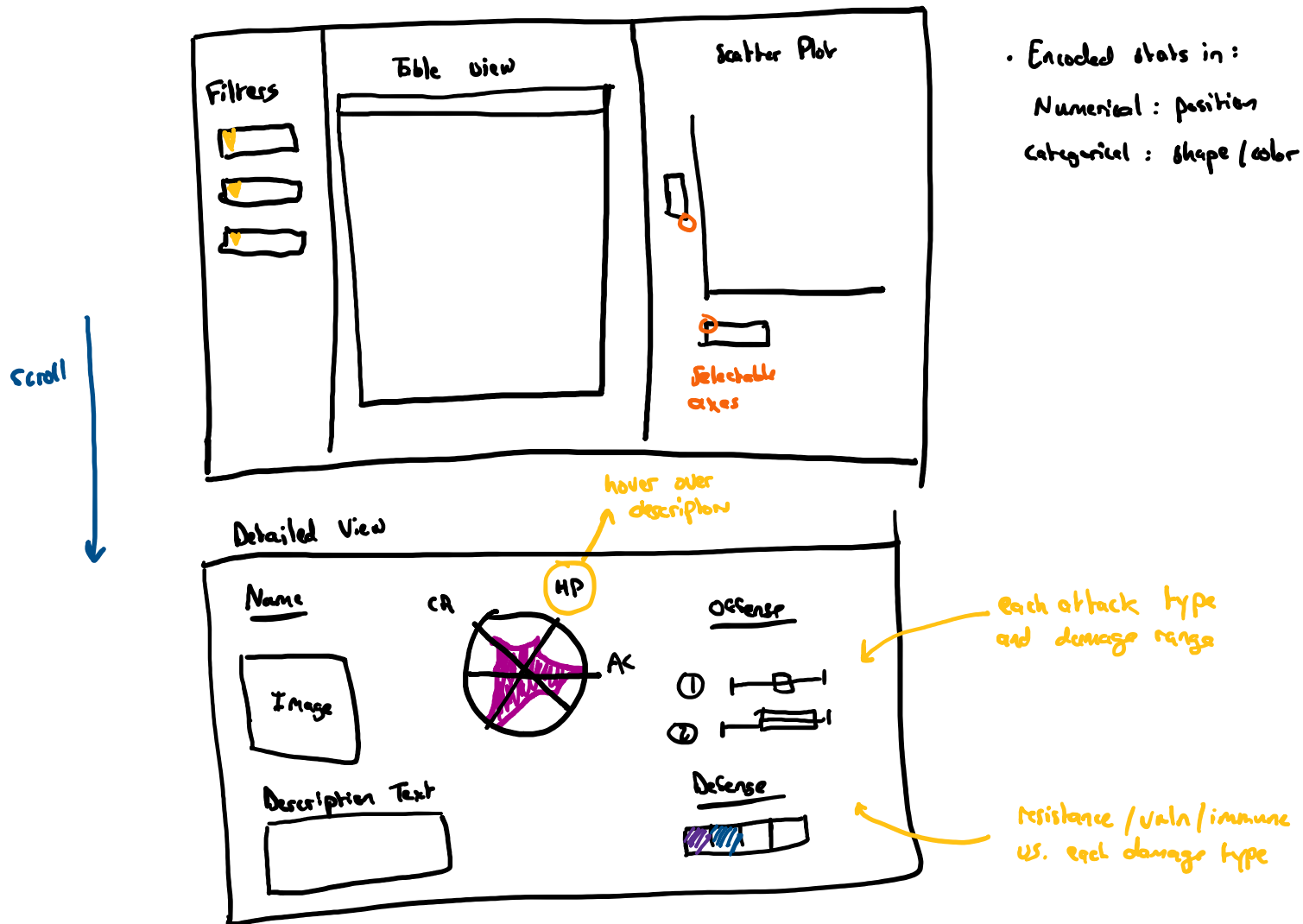- requires calculation + assignment
- condense to "offense" stat?

+ More interesting to focus on the detailed view

- More derived data → More processing, somewhat arbitrary assignment

Design Prototype:

Filters

Table View

Scatter Plot

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

Scroll

Selectable axes

hover over description

Detailed View

Name

Image

Description Text

CA

HP

AK

Offense

Defense

Each attack type and damage range

Resistance / vuln / immune us. each damage type
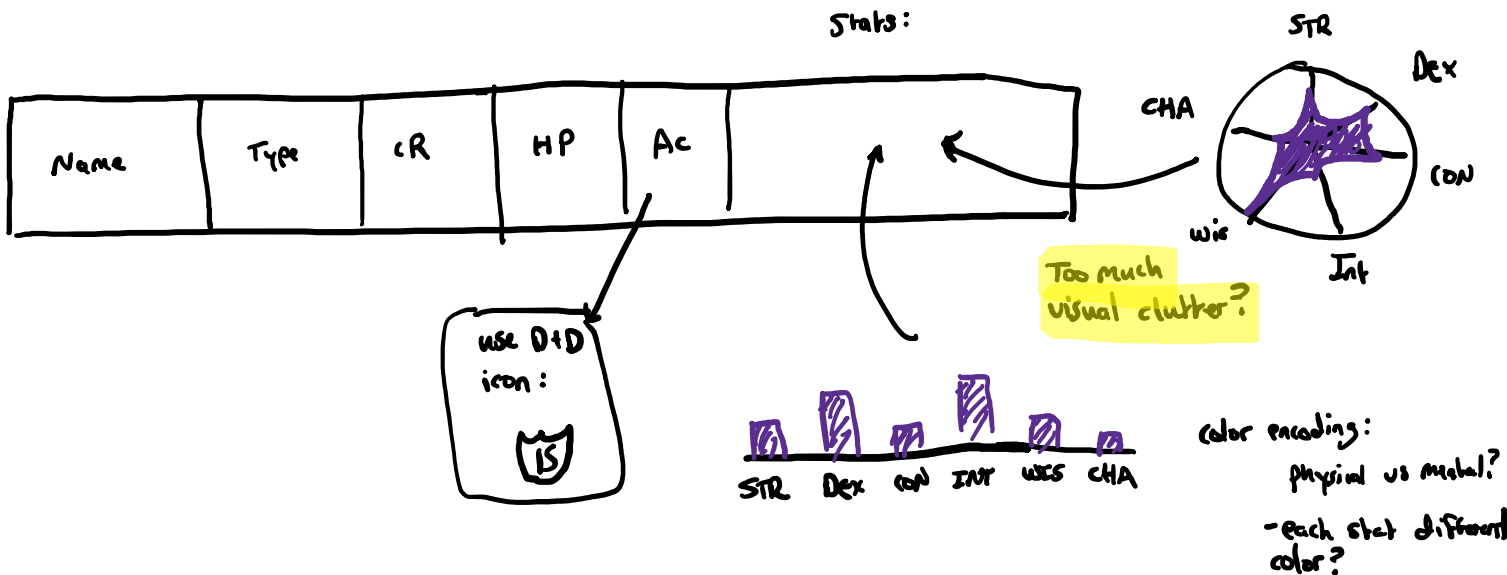
- Encoded detailed statistics in
  - Radial area chart :
    - shows areas of strength and weakness

  - Bar chart :
    - shows predicted distribution of damage output

  - Heat Map
    - Easily digestible - at a glance see what immunities / vuln / resistances

Design Evolution

Table View

After implementing the rough initial design, I explored different ways to visualize the 'statistics' section of the table view.

The data in this case consists of six different stats: Strength, Dexterity, Constitution, Intelligence, Wisdom, and Charisma. I'm currently experimenting with a radar chart view, although I'm not sure if this will take up too much room in the table. It may be more suited for the detailed monster view after selection.

Stats:

Name	Type	CR	HP	Ac	

use D+D icon:
15

STR Dex CON INT WIS CHA

Too much visual clutter?

STR
Dex
CON
Int
Wis
CHA

Color encoding:
physical vs mental?
- each stat different color?

Design Evolution

Overview (scatterplot)

Encoding should consist of numeric values for X, Y and size dimensions, and categorical values for color or shape.
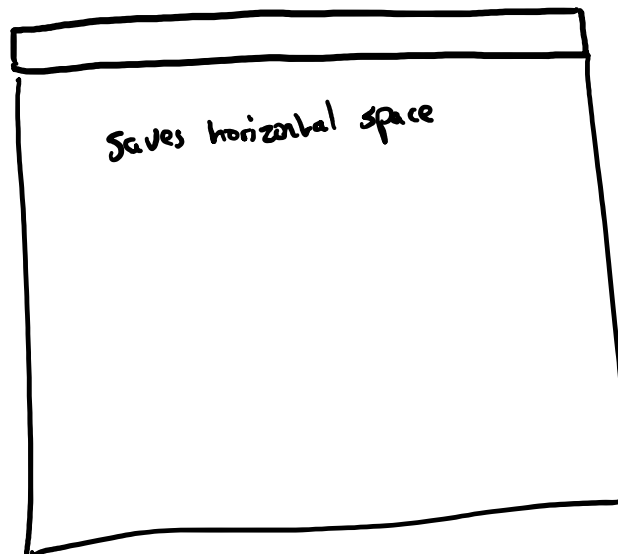

Categorical values:
- Type
- Legendary
- Alignment
- Size
  (small, med, large)

Numeric values:
- HP
- CR
- AC
- Stats: (STR DEX CON INT WIS CHA)

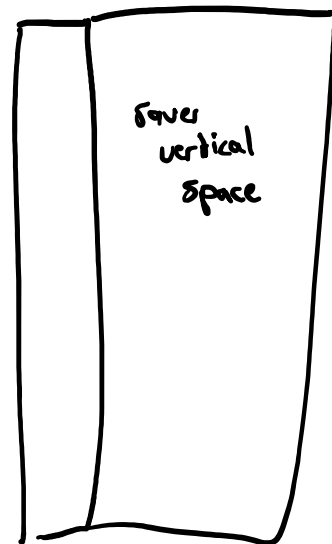grouping in Filter?

Design Evolution

Detailed View (single selection)

The API provides a link to .png artwork for many of the monsters in the dataset, I'll investigate linking to see how it performs. Global filter location: should it be a top navigation section or a sidebar?

Filters:

Saves horizontal space

or

collapsible?

Saves vertical space

; slider w/ text values

multi-select text entry for categorical variables

...
...
...

Detailed view: "Monster card"

Image

Mimic styling of D&D character sheet?
Better visual encoding?