IT UNIVERSITY OF COPENHAGEN

Data Visualisation and Data-driven Decision Making

Final Exam:
Rock Climbing:
Increase Difficulty, Increase Fun

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BSDVDDM1KU

1 Introduction

This paper contains three visualizations of climbing data from OpenBeta. OpenBeta is an open source project that provides free and open access to rock climbing data (Nguyen). OpenBeta's source is Mountain Project (MP) (Project); an API containing a database of climbs that can be used as a guidebook. In rock climbing it is common to use a star system to rate how fun and safe the climb is, and in MP users can rate a climb using a 4 star system. While rating a climb is a subjective task, the general meaning of the stars are as follows:

- 1 Star: OK
- 2 Stars: Good
- 3 Stars: Great
- 4 Stars: Classic

I have been on plenty of routes with low stars. Sometimes the low rating indicates that the route is not safe. For example, one route in Vietnam was covered in large, biting ants about 15 meters up. I have been fortunate to have been on some highly rated climbs as well; the memory of which ring in my mind with a ethereal and heavenly glow. Therefore, with this data in hand, I was curious to see if there was a pattern with certain types of climbing, difficulty of routes, and that sought-after 4 star rating.

Intended Audience The intended audience is rock-climbers. Visualizations such as these could be posted in a climbing publication, or added to MP's API. Since it is unknown whether the readers of this paper are familiar with this sport, some definitions and context follow:

MP was started in the United States, therefore the systems used to rate difficulty in MP are US grading systems; including the Yosemite Decimal System (YDS) for the various types of roped climbing, and Vermin (V) for the style of climbing called 'bouldering'. The YDS ranges from 5.0 (easiest) to 5.15d (hardest), while Vermin ranges from V0 to V16. The data also contained information on the type of climbing, which includes bouldering, mixed, sport, or traditional style climbing. It is assumed that the intended audience is familiar with these definitions.

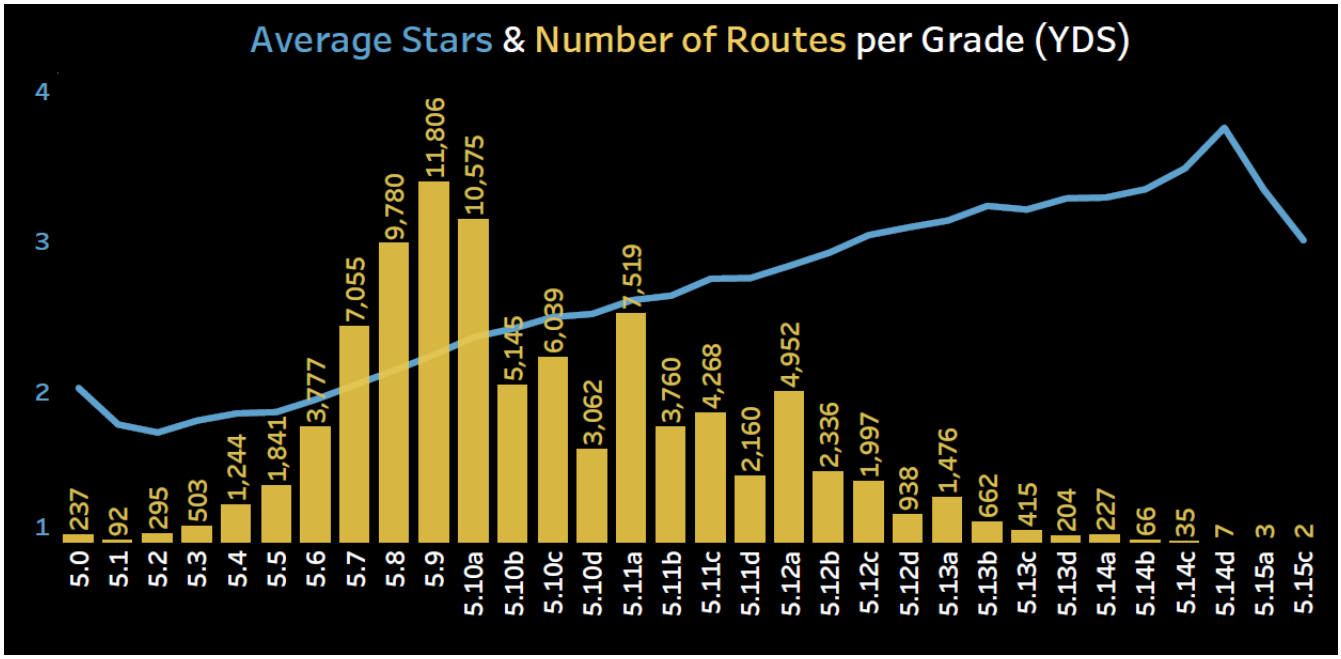
2 Visualizations

Visualization 1

This chart is intended to visualize the pattern between average star ratings in roped climbing and the number of routes per difficulty grade. The combination of bar and line chart seemed to make the most sense in this instance. I tried out a few other options. The line chart seems to convey the overall increase in average stars most intuitively, while the bars convey the volume of climbs at each individual grade.

The rotated X-axis labels are aesthetically disagreeable, and the user experience is not optimal as it requires the user to have to read side-ways. However, a climber will often have a specific grade that they are interested in. Therefore, the benefit of being able to see each individual label outweighed that cost, and it made sense to include each label compared to only showing every-other.

Figure 1: Visualization 1



As a note: the data is not comprehensive. Routes are typically logged on MP as people climb them. Therefore the increasing average star rating as climbs get harder does not necessarily indicate that harder climbs are also better. It could just mean that climbers become more selective when the climbing gets harder. A 5.15c, for example, is damn-near impossible and reserved for only the most elite climbers on the planet and sometimes requiring years training for a specific route. Further data would be needed to statistically verify if there is a correlation. However, the casual user who climbs at a 5.10a can still see there are over 10,000 routes on MP that are likely quite fun, and use this information as inspiration to go outdoors.

Visualization 2

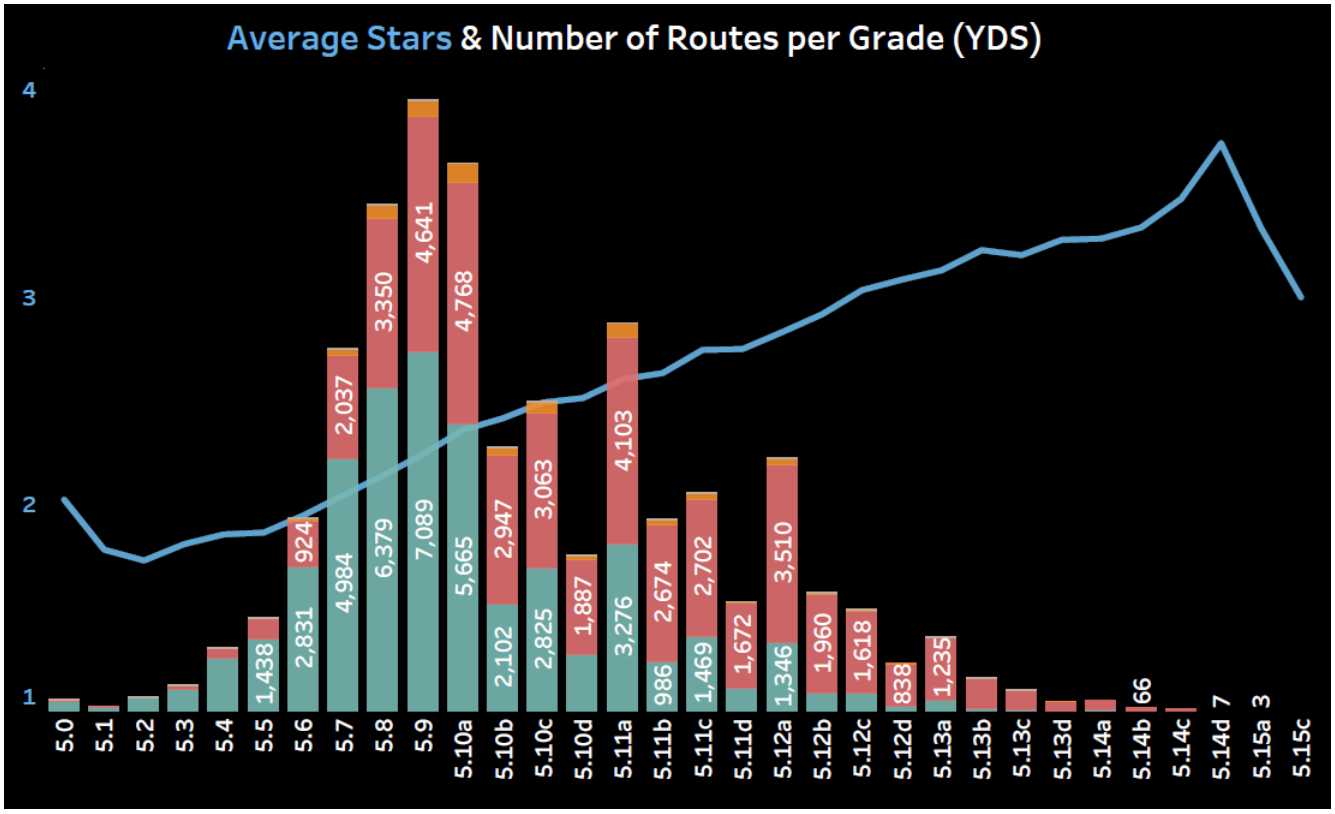
This chart is not intended as a stand-alone image but is a screenshot of an interactive dashboard. A climber often focuses on a specific type of climbing, and this dashboard allows the user to filter Visualization 1 by their type of climbing and investigate if the same pattern exists. The user can also click on the grade to see the specific average star rating, and expand the data to see all of the routes at that grade.

The link to the interactive dashboard can be found here: Visualization 2

The stacked bar chart was chosen as the initial chart before the user filters to their desired type of climb. On it's own it is difficult to perceive any patters. Additionally, not all grades have the exact numbers listed. However, as this is interactive, these limitations are set aside as the user can visualize the exact amounts and star ratings per category.

When hovering over the graph a text box pops up with field categories. However, the values are not filled in. An improvement would be to have this text box filled in with the data at that location.

Figure 2: Visualization 2



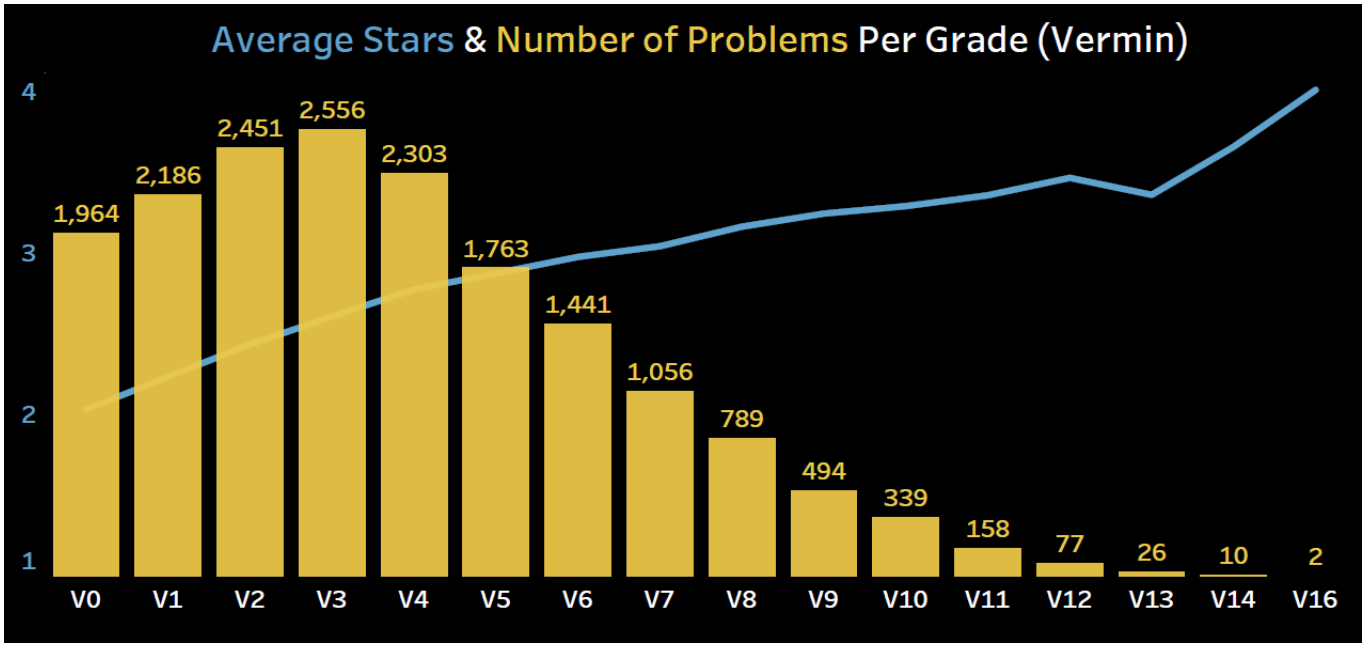
Visualization 3

This chart is intended to visualize if the pattern displayed in roped climbing also exists in bouldering. Many people who climb are only interested in this style of climbing, and it seemed important to visualize this separately. As stated previously, this type of climbing uses the Vermin grading system to rate difficulty.

3 Final Remarks

The next step in this project will be to add location data. With this additional data the user will be able to zoom in on an area in the map where there is climbing, and more easily see the distribution of the climbing grades and the average stars per grade in that location.

Figure 3: Visualization 3



References

Nguyen, Viet. "OpenBeta". https://github.com/OpenBeta/climbing-data/tree/main/curated_datasets.

Project, Mountain. "Mountain Project". Visited on 2022. https://www.mountainproject.com/.