Design & Implementation of 2 Visualisation Systems for Hiking Trails Data

The Residuals

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# Video Demonstration

Video demonstration of each visualisation system can be found at the following link.

**The Zebra System:** link

**The Giraffe System:** link

# Data Set Description

The Washington Hiking data set contains data on hiking trails in Washington State. The data set comes from the Tidy Tuesday community repository [1] and can be found at <https://github.com/rfordatascience/tidytuesday/tree/master/data/2020/2020-11-24>. It was obtained by scraping the Washington Trails Association website in November 2020 [2], however the data set is offline. The data set type is a 2-dimensional table, with static availability. The data item is a hiking trail, which is specified by name. The data attributes are location, length, gain, highpoint, user rating, and trail features. Hike trail description is of text data type [3].

|  |  |  |
| --- | --- | --- |
| Attribute | Attribute Type | Ordering Direction |
| location | categorical | - |
| length | quantitative | sequential |
| gain | quantitative | diverging |
| highpoint | quantitative | diverging |
| features | categorical | - |

Table : Classification of Data Attributes

# Visualisation Objectives

The main audience of the visualisation system is a beginner hiker visiting a national park in Washington State. The beginner hiker does not have a particular hiking trail in mind, and they would like to identify which one to take. The hiker would like to browse the available hiking trails at glance or look up which hiking trails have the attributes they are interested in.

The main outcome of the data visualisation is for hiker to know the name of the trail they want to hike. The target attributes are length, gain and highpoint. For example, the hiker might like to know which trails are the shortest or provide the highest peak. The combination of these attributes is relevant, for example high gain relative to short length would be challenging.

Hikers might also be interested in additional attributes, such as user rating. Rating should be conveyed by colour or size. In this way, hikers could also explore correlation between these attributes. For example, they could discover that trails with high gain are lower rated and avoid them intuitively. Lastly, the system could summarise facts about the region or trail features.

# System Implementation

The visualisation systems are called The Zebra System and The Giraffe System. The implementation process of both systems can be followed in the program code, which can be found in the accompanying folders **zebra.zip** and **giraffe.zip**. For demonstration, see Video Demonstration.

# Design Comparison

[6 decisions, 100 words each]

# User Evaluation

[400 words, data in Appendix A]

# Future Work

[100 words]

# Appendix

[user evaluation data]

# Bibliography

[1] Thomas Mock (2021). Tidy Tuesday: A weekly data project aimed at the R ecosystem. <https://github.com/rfordatascience/tidytuesday>.

[2] *tidytuesday/data/2020/2020-11-24 at master · rfordatascience/tidytuesday*. (n.d.). Retrieved July 21, 2021, from https://github.com/rfordatascience/tidytuesday/tree/master/data/2020/2020-11-24

[3] *TEXT data type - IBM Documentation*. (n.d.). Retrieved July 21, 2021, from <https://www.ibm.com/docs/en/informix-servers/12.10?topic=types-text-data-type>

[4]