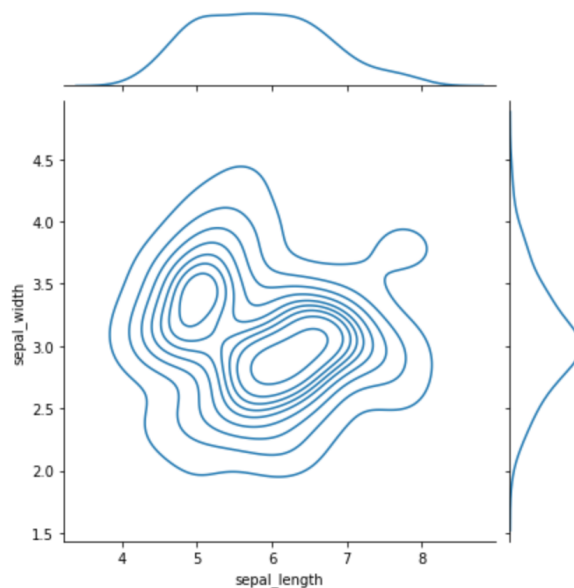


# DS4200 Assignment 4

Anjali Tanna

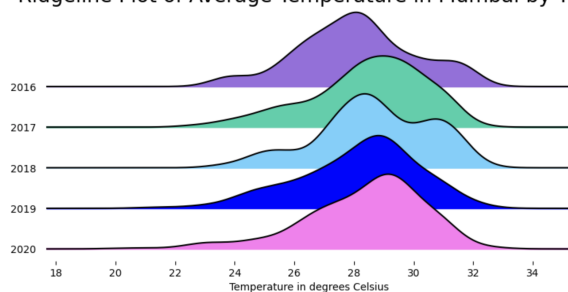
## Part 1 - Visualization Categorizations & Graphs in Python

1. A new type of visualization I learned about in the Python Graph Gallery is a Marginal Plot. This was the most interesting graph to me because of the marks and channels it uses to encode the data. This plot allows users to view the relationship between 2 numeric variables and their correlation. The marginal charts on the top and the right show the distribution of 2 variables, which I find interesting.

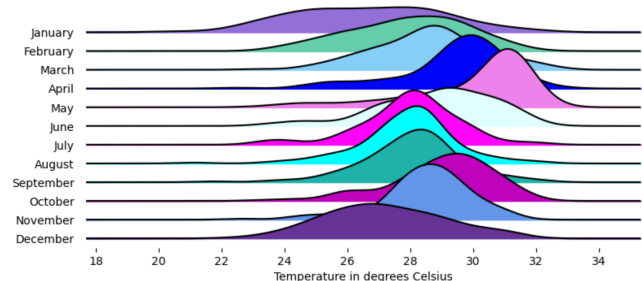


2. These are the visualizations I created in Jupyter Notebooks. [The code can be found in my GitHub repository using this link.](#)

Ridgeline Plot of Average Temperature in Mumbai by Year



Ridgeline Plot of Average Temperature in Mumbai by Month

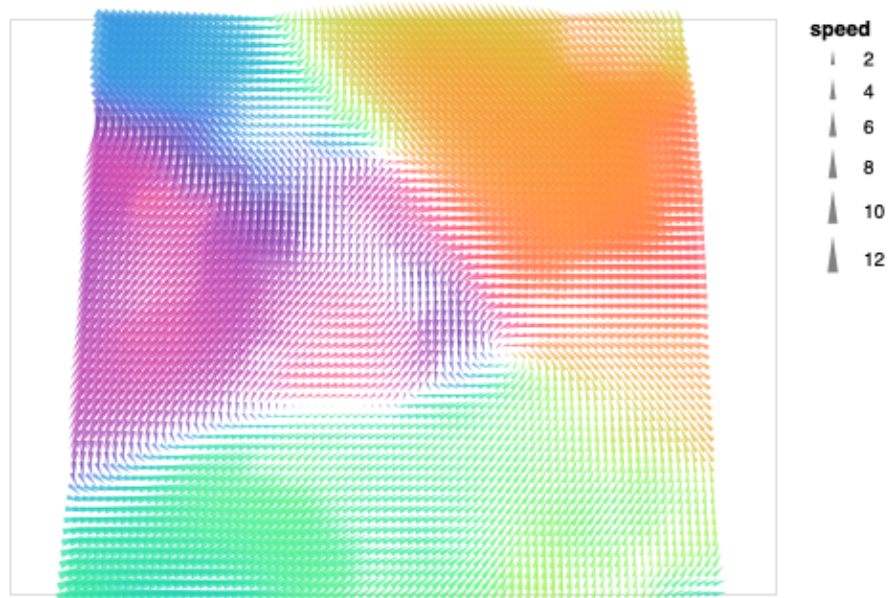


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## Part 2 - Introduction to Altair

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1. A new type of visualization I learned about in the Altair Graph Gallery is a Wind Vector Map. This was the most interesting graph to me because of the marks and channels it uses to encode the data. This vector array map shows wind speed and direction by using a wedge (mark), color (channel), tilt (channel) and size (channel).



2. The “Seattle Weather Heatmap” Case Study code is analyzed in the A4 [Jupyter Notebook found in my GitHub repository](#). A snippet is shown below:

```
1 # Import necessary libraries
2 import altair as alt
3 from vega_datasets import data
4
5 # Import data from a URL (over 5,000 rows)
6 source = data.seattle_temps.url
7
8 # Create visualization
9 alt.Chart( # Create a chart in altair that accepts the data
10     source, # Insert the data into the chart
11     title="2010 Daily High Temperature (F) in Seattle, WA" # Create a title for the visualization
12 ).mark_rect().encode( # Create a filled rectangle with mark_rect(), set up for encodings
13     x='date(date):0', # Create x-axis label and set x-axis
14     y='month(date):0', # Create y-axis label and set y-axis
15     color=alt.Color('max(temp):Q', # Create color channel as max temp
16                     scale=alt.Scale(scheme="inferno")), # Set color scheme
17     tooltip=[ # Create interactivity when the cursor moves around the plot
18         alt.Tooltip('monthdate(date):T', title='Date'), # Adds Date when cursor is placed on plot
19         alt.Tooltip('max(temp):Q', title='Max Temp') # Adds Max Temp when cursor is placed on plot
20     ]
21 ).properties(width=550) # Set width of the chart
```

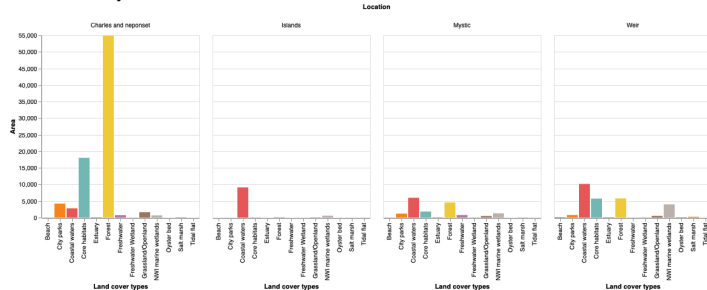
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## Part 3 - Visualizing Boston Pollution Data

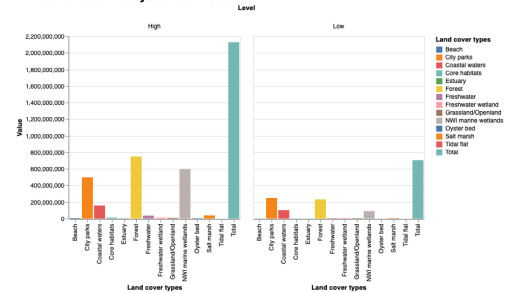
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1. Boston Harbor Clean-up project video watched.
2. Journal article read.
3. The article titled "The Biogeography of Deep-Water Chemosynthetic Ecosystems" provides a comprehensive overview of the biogeography of deep-sea chemosynthetic ecosystems. These ecosystems are based on chemosynthesis, a process by which bacteria use chemicals to produce organic matter, and support a variety of unique and specialized fauna. The article examines the distribution and diversity of these ecosystems across different regions of the world's oceans, highlighting the importance of geological and environmental factors in shaping their biogeography. The authors also discuss the potential impacts of human activities on these ecosystems, emphasizing the need for conservation and management efforts to preserve these unique and fragile habitats.
4. Visualization Recreations are found in the A4 [Jupyter Notebook in my GitHub repository](#). Images are shown below:

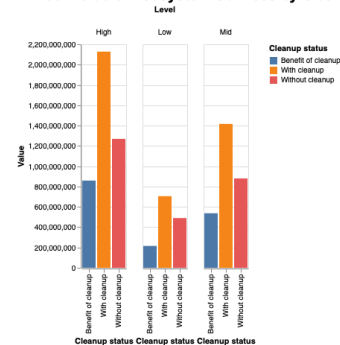
Land Cover Area by Watershed



Annual Value of Ecosystem Services



Annual Value of Ecosystem Services by Cleanup Status



5. Written summaries can be found in the A4 [Jupyter Notebook in my GitHub repository](#).

