PROGRAMMING EXERCISE 1: TABLEAU PUBLIC

Student name: Ananya Pandey
Student ID: 30757924
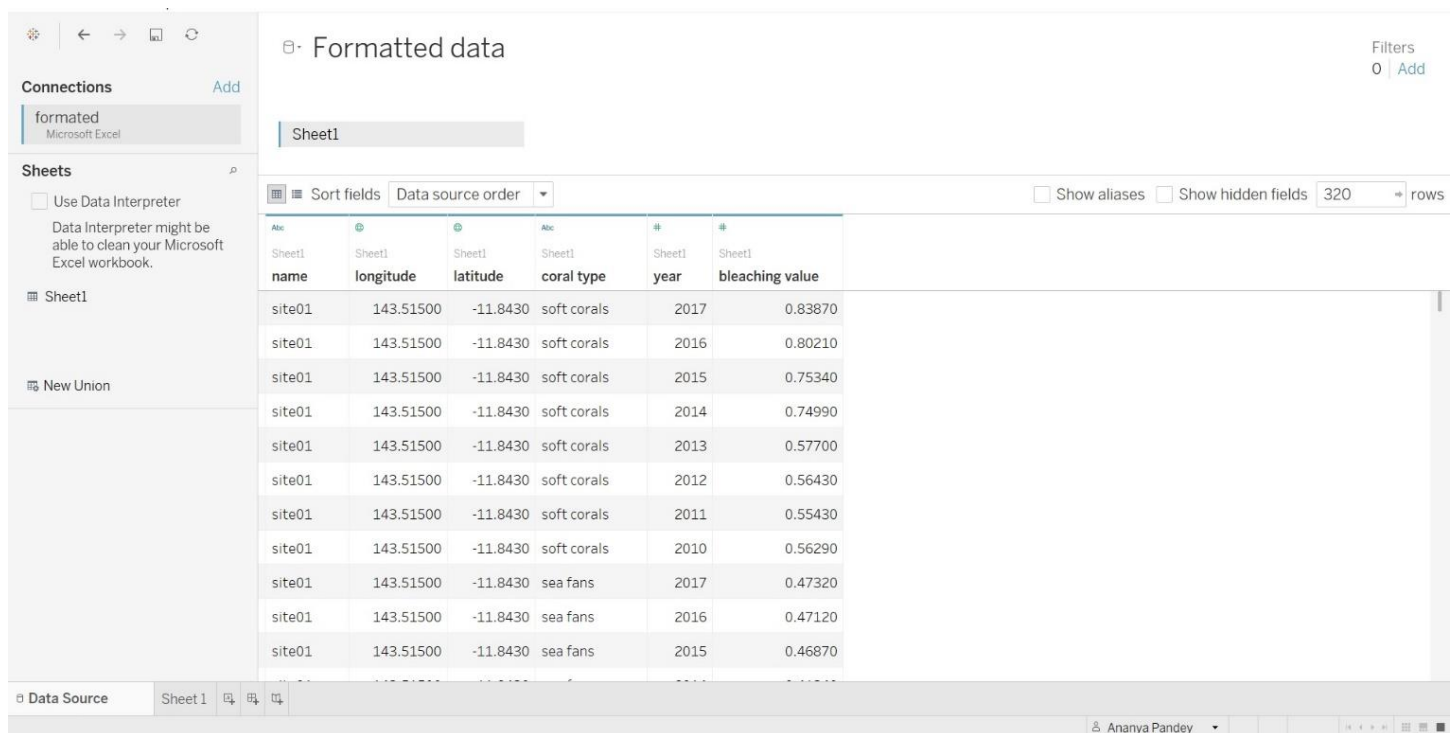Activity Number: Tutorial 05-P1
Tutor Name: Farah Tasnuba Kabir

DATA WRANGLING:

As the data provided is not suitable for use with Tableau, the data had to be reformatted. The given data contains multiple layers(hierarchy) of column headers, so the reformatting of the data has been done manually using Excel where separate columns have been created for each header directly, i.e., for the coral type, year and their corresponding bleaching values. In the case of missing bleaching values, they have been replaced by 0.000% to show that either that type of coral was not found at that location or it did not undergo any bleaching at that site during that year.

Formatted data-

Fig1: Data after the wrangling process

Figure 1 shows how the data looks like on being read into Tableau after the data wrangling process is completed.

DATA VISUALISATION:
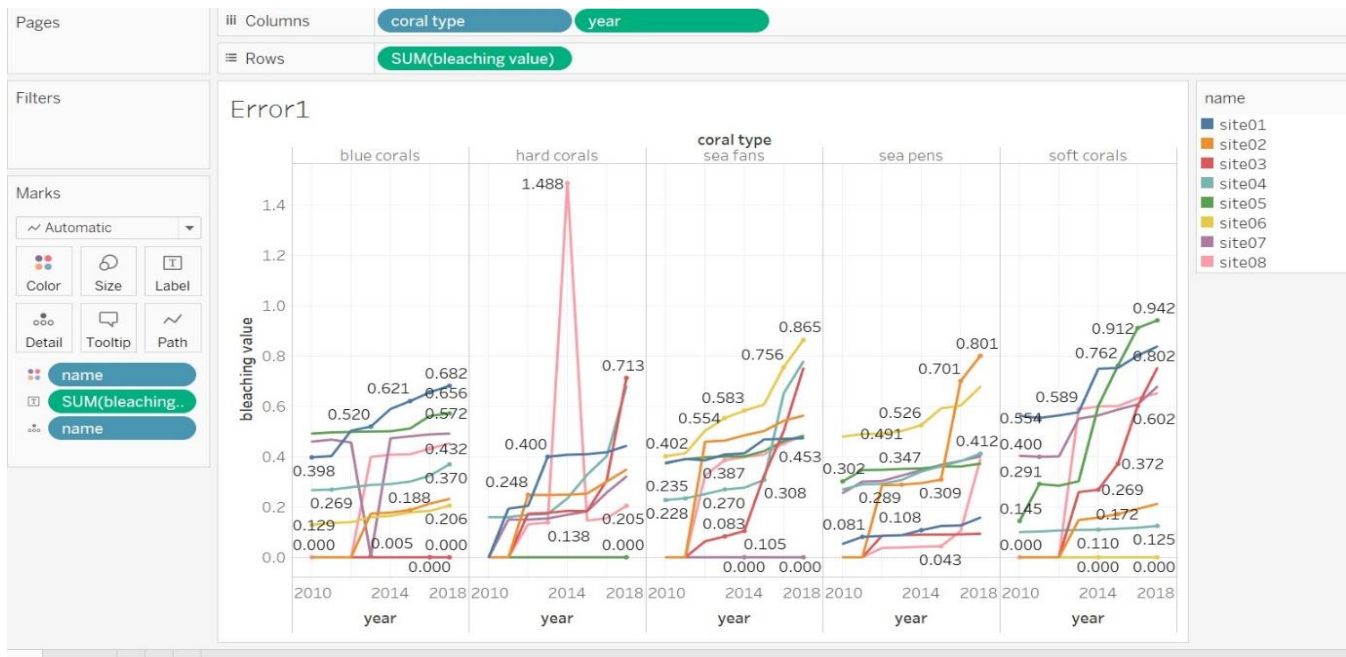
- Error 1: Outlier point in the data

Fig2: An anomaly in the data

Here, for hard corals at *site08* in 2014, the bleaching value is *1.488*. This value
is invalid as the percentage cannot be greater than 100%. Thus, there is an anomaly in the
data and can be fixed by taking the mean of the bleaching values at that site and replacing
the invalid one with the mean.

mean = (20.450 + 15.560 + 14.560 + 13.480 + 13.100)/7 ~ 11.07%.
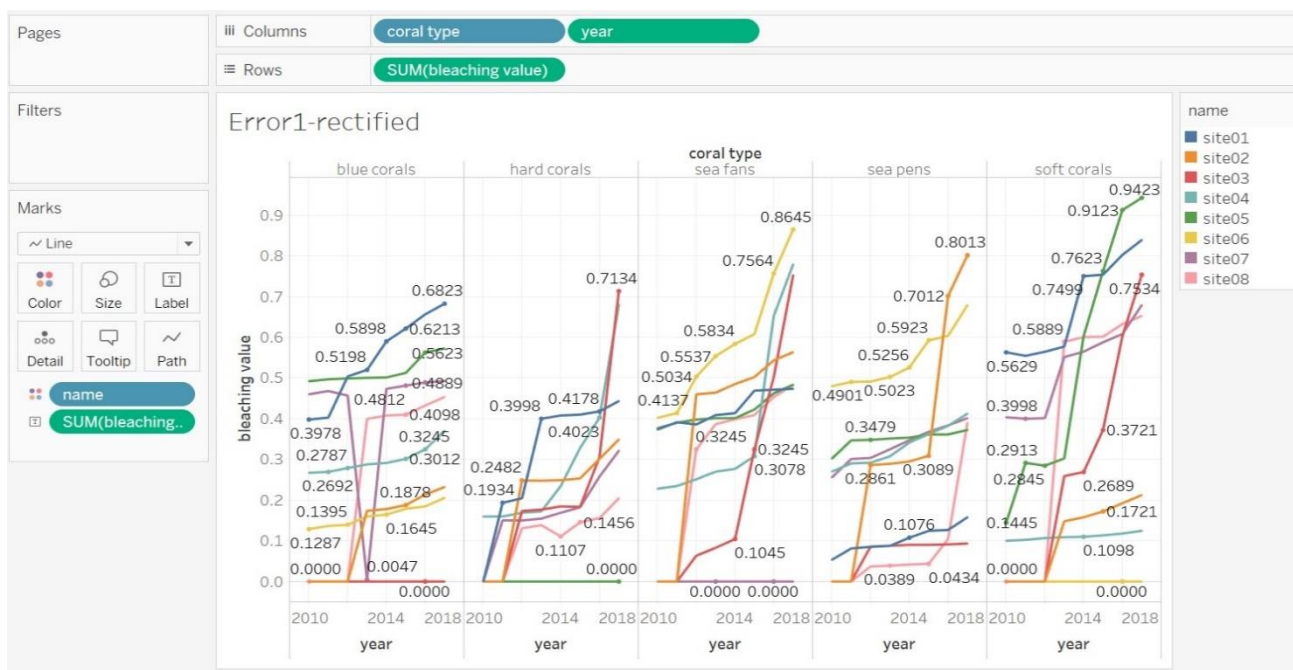

Fig3: After rectification of error1

Figure 3 shows the bleaching values of each coral type for each year after the outlier point
error has been rectified.
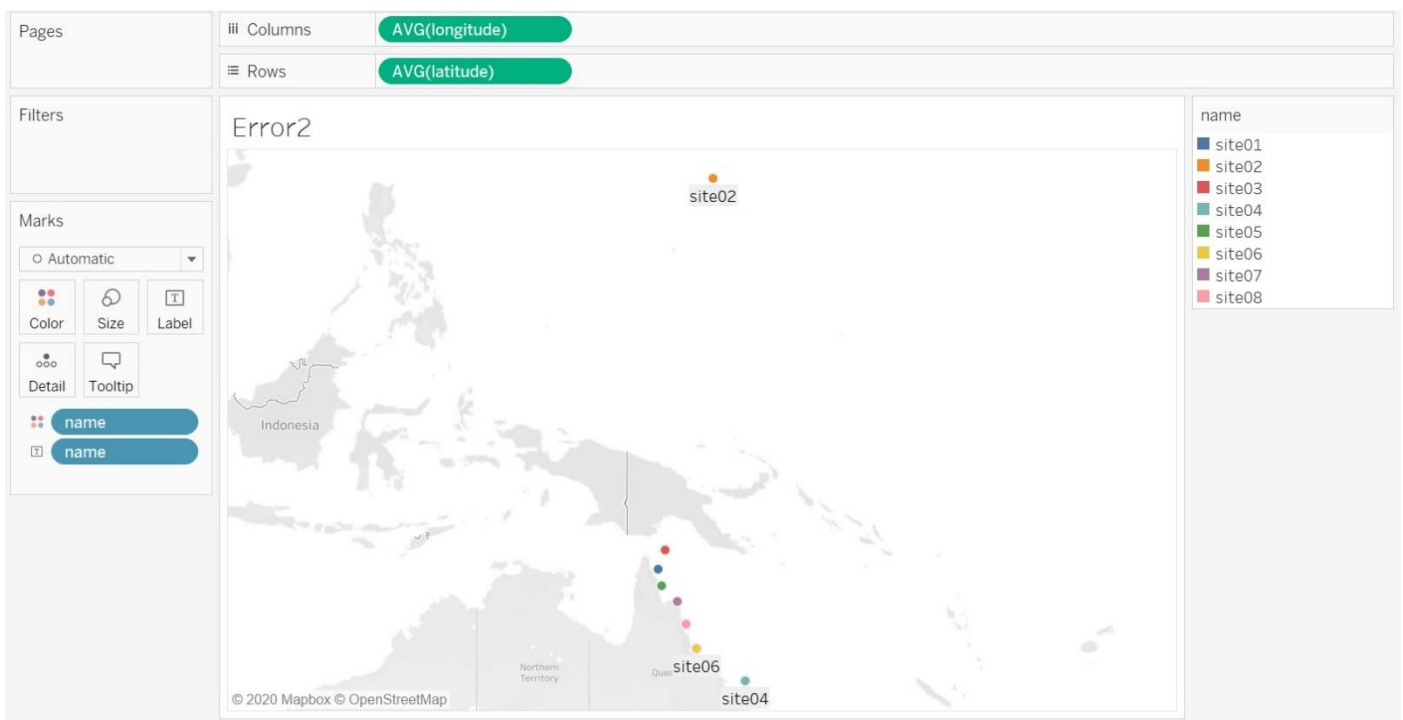
- Error 2: Coordinate error

Fig4: Coordinate error

All the sites are situated on the north-eastern border of Australia whereas *site02* is situated far away from the rest of the sites. The positive latitude for *site02* can probably be accounted for this error as all other sites have negative latitudes. To fix this error, the positive value of the latitude has been changed to negative.
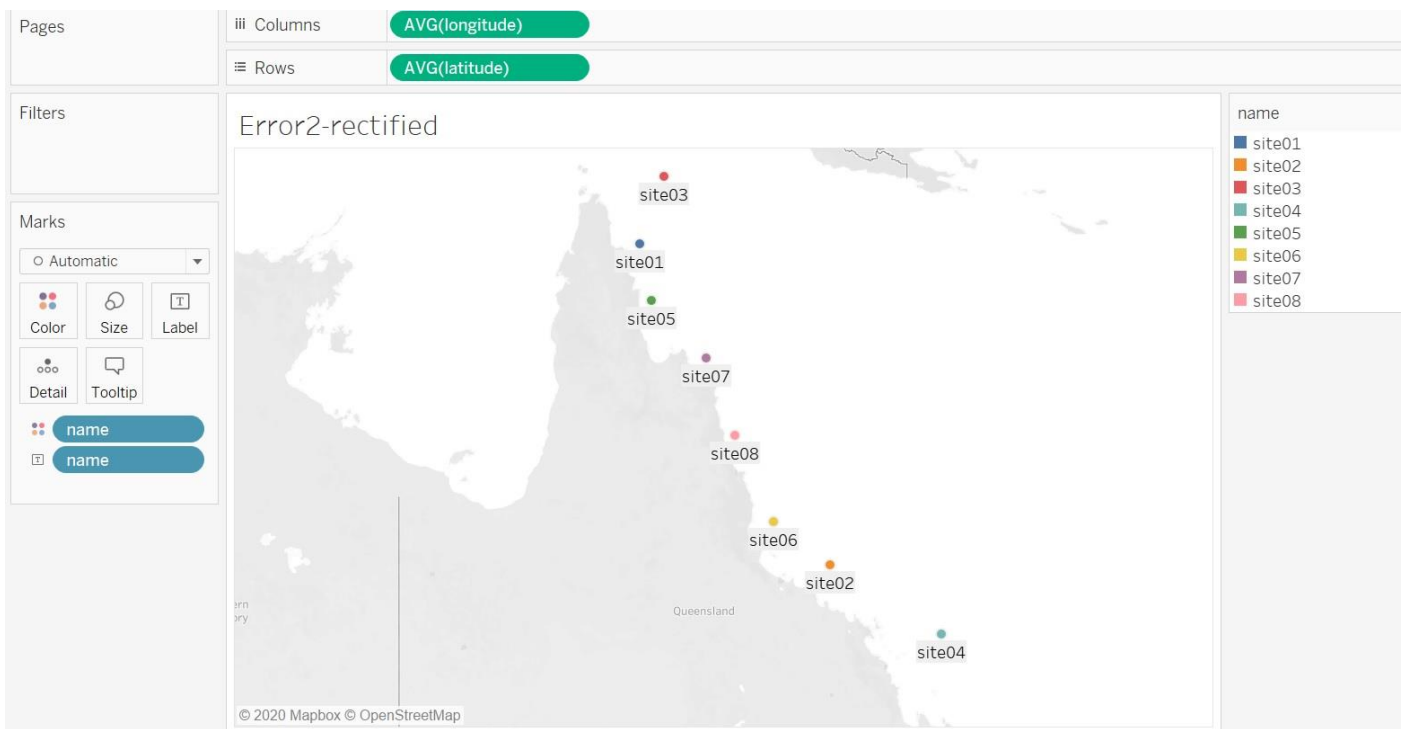

Fig5: Coordinate error rectified

Figure 5 shows the location of all the sites after the coordinate error has been fixed.

Question 1-

Fig6: Bleaching trend of each coral type

Figure 6 shows the yearly bleaching trend from 2010 – 2017 for the different types of coral in the Great Barrier Reef.

For 2010 and 2011, the coral bleaching is worst for the blue corals, whereas for 2012, 2013 & 2017, it is worst for sea fans and for 2014, 2015 & 2016, it is worst for soft corals. From the visualisation, it appears that soft corals and sea fans are bleaching at a higher rate than the other types of corals.
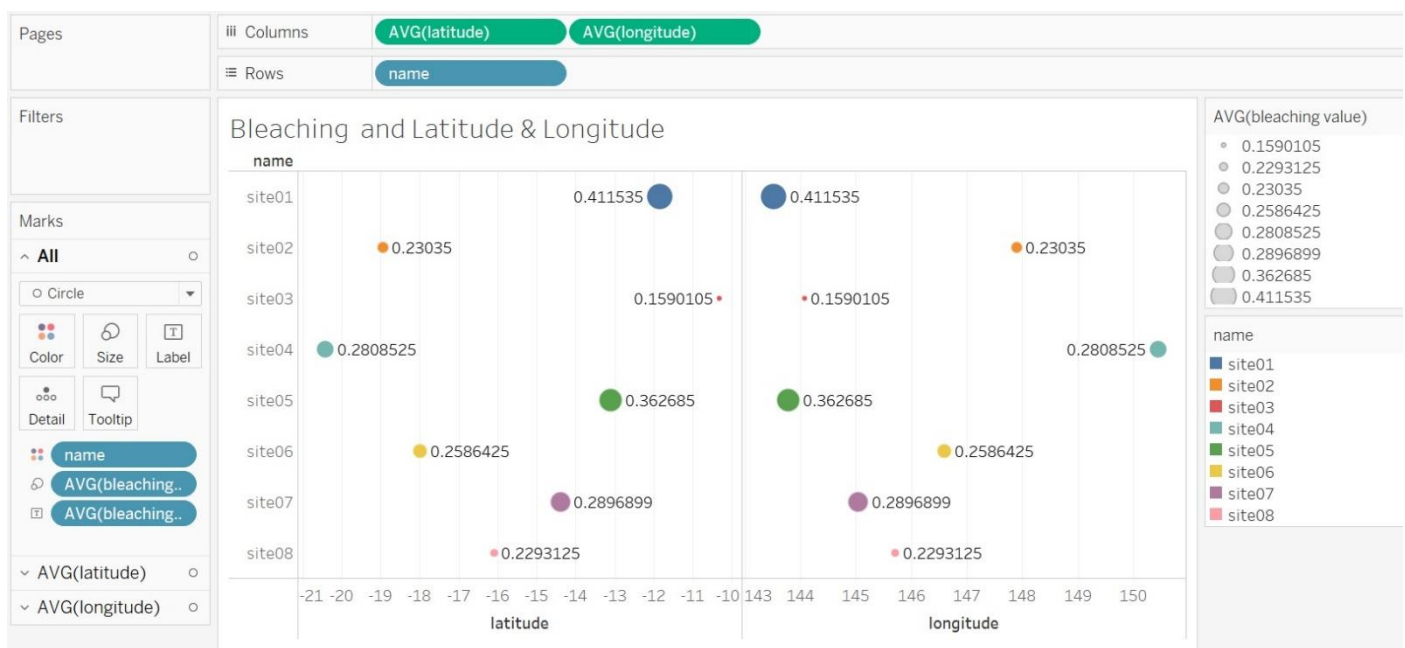
Question 2-

Fig7: Relation between bleaching and Latitude & Longitude

Figure 7 shows how the latitude and longitude affect the bleaching of different types of corals.
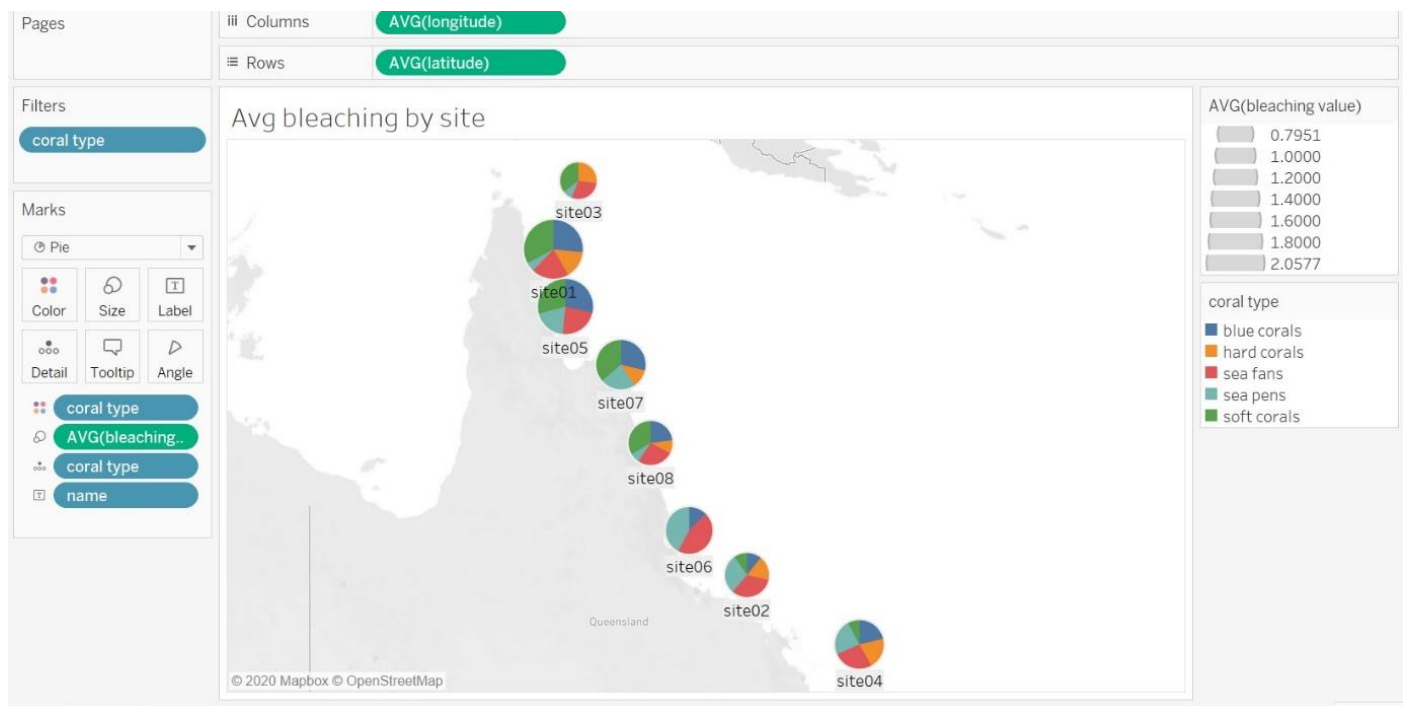

Fig8: Average bleaching of corals by location

Figure 8 displays the average bleaching of different types of corals by their location.

As can be seen in the figure, at *site01, site02, site03* and *site08* all the types of corals are found and have bleached over the last 8 years whereas, at *site03*-blue corals and *site05*-hard corals, have not bleached or are not found at these sites. Similarly, at *site06*-hard corals and soft corals and *site07*-sea fans, have not bleached or are not found at these sites respectively. It is evident from the visualisation that the bleaching is higher where the site is close to the land. The prolonged warmer temperature and poor quality of the water near the land due to pollution can be a major reason for the bleaching of the corals.