



# ASSIGNMENT 1

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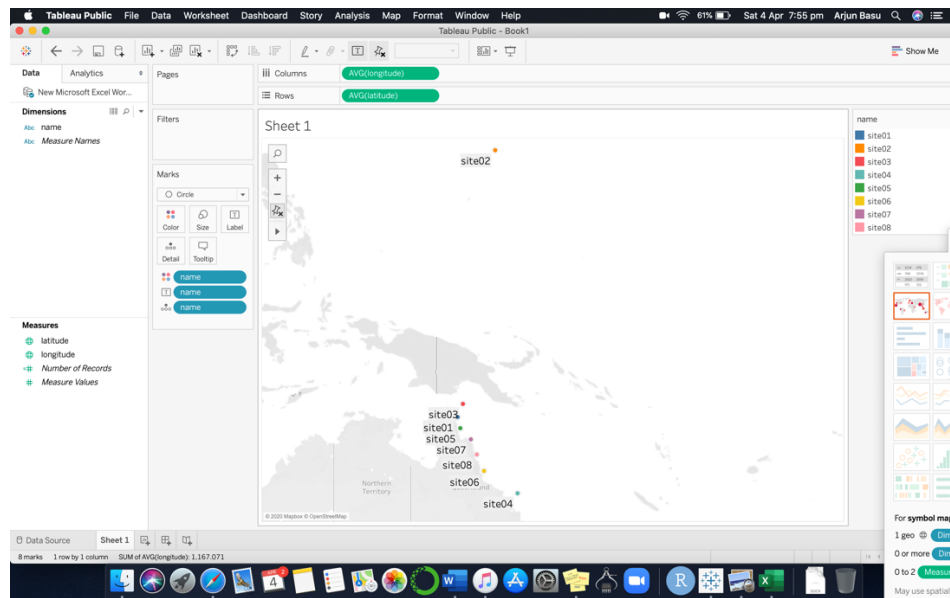
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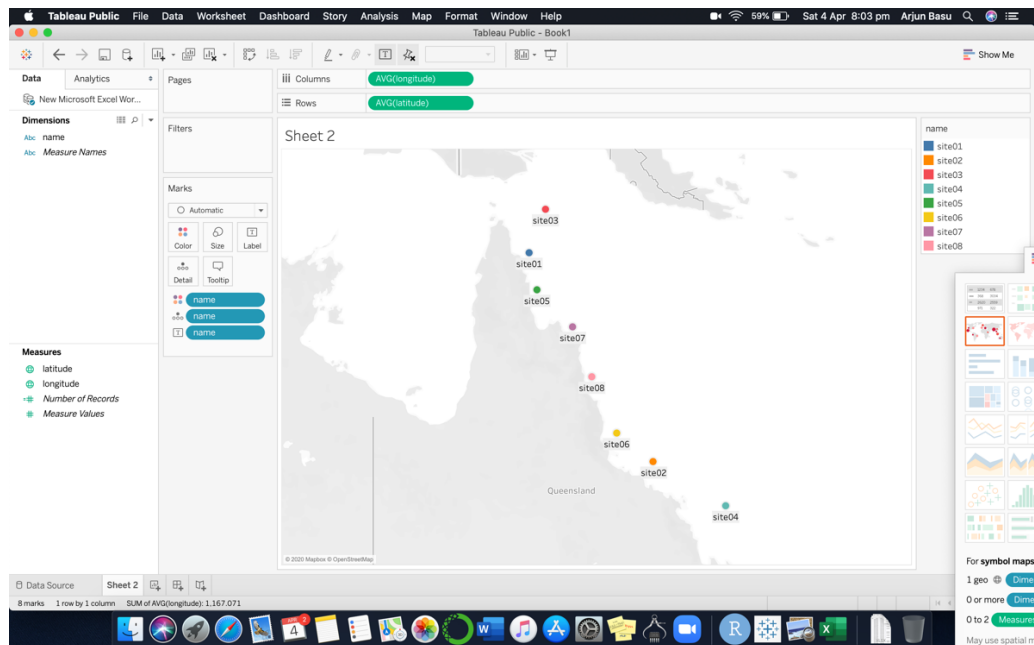
## PART A: DATA EXPLORATION

Following are the steps I followed for the data cleaning and data wrangling to deal the errors:

1. In order to find the sites visually (if they are correct), I have plotted the site's location through the columns site, latitude and longitude by manually extracting these columns in a different file.



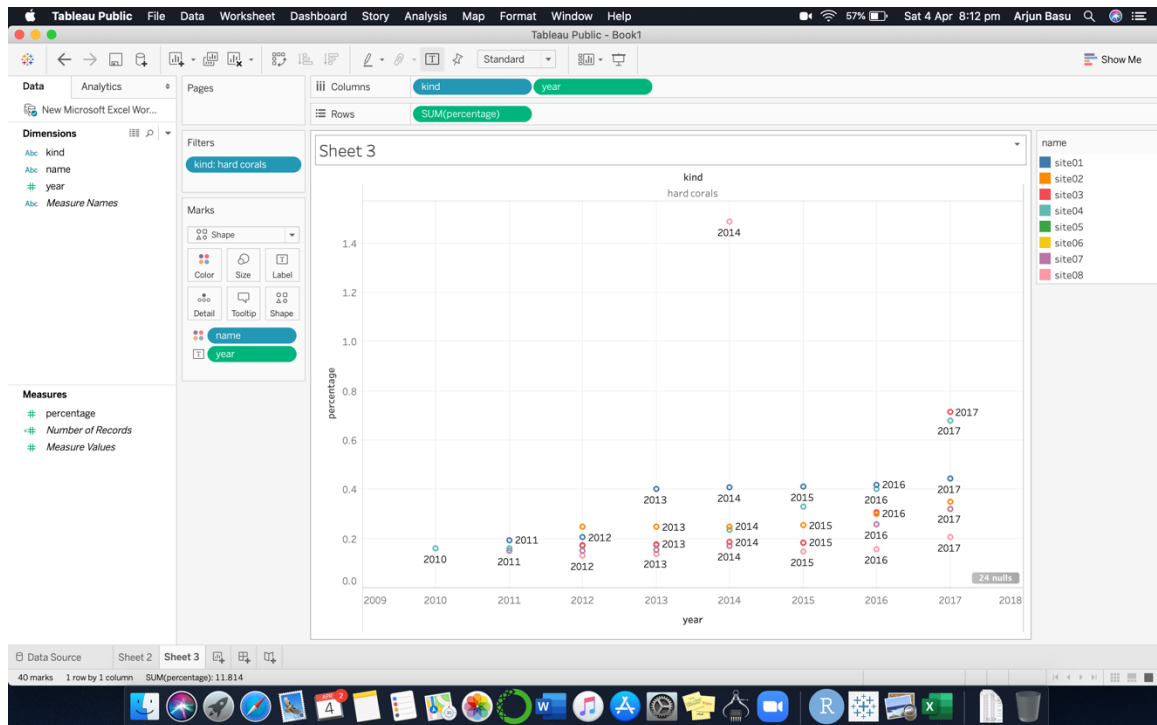
2. We can see that one of the locations (site 2) is not correct and is not in close vicinity of the other sites and after checking the latitude and longitude of the sites, I found its latitude is not correct (must be negative). After correction, please find below the correct location:



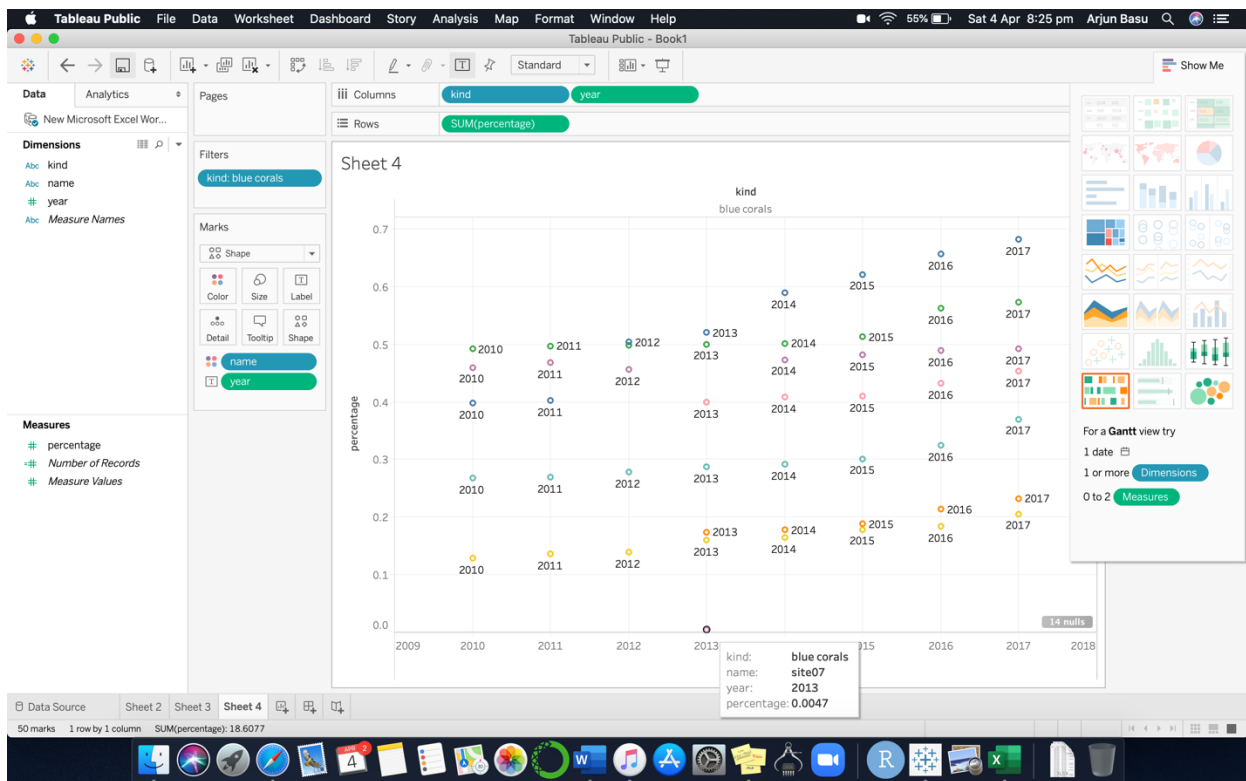
3. Now, we are manually creating two new columns Coral Kind and Year to separate the different Corals in different years at different sites. Also the missing values are considered null and the data now looks like below:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	name	coral kind	year	bleaching																	
2	site01	soft corals	2017	83.87%																	
3	site01	soft corals	2016	80.21%																	
4	site01	soft corals	2015	75.34%																	
5	site01	soft corals	2014	74.99%																	
6	site01	soft corals	2013	57.70%																	
7	site01	soft corals	2012	56.43%																	
8	site01	soft corals	2011	55.43%																	
9	site01	soft corals	2010	56.29%																	
10	site02	soft corals	2017	21.23%																	
11	site02	soft corals	2016	19.23%																	
12	site02	soft corals	2015	17.21%																	
13	site02	soft corals	2014	15.78%																	
14	site02	soft corals	2013	14.80%																	
15	site02	soft corals	2012																		
16	site02	soft corals	2011																		
17	site02	soft corals	2010																		
18	site03	soft corals	2017	75.34%																	
19	site03	soft corals	2016	60.23%																	
20	site03	soft corals	2015	37.21%																	
21	site03	soft corals	2014	26.89%																	
22	site03	soft corals	2013	25.89%																	

4. While plotting the different corals types' bleaching percentage, I found that for hard coral there is an absurd bleaching percentage for the year 2018 and the corresponding value was 148.80 and the manually corrected value to 14.88:



5. Also, for blue coral, I found out through visual plot that the bleaching percentage at site 7 was 0.470 in the year 2013. Hence, I manually changed it to 47.0 after observing its before and after values.



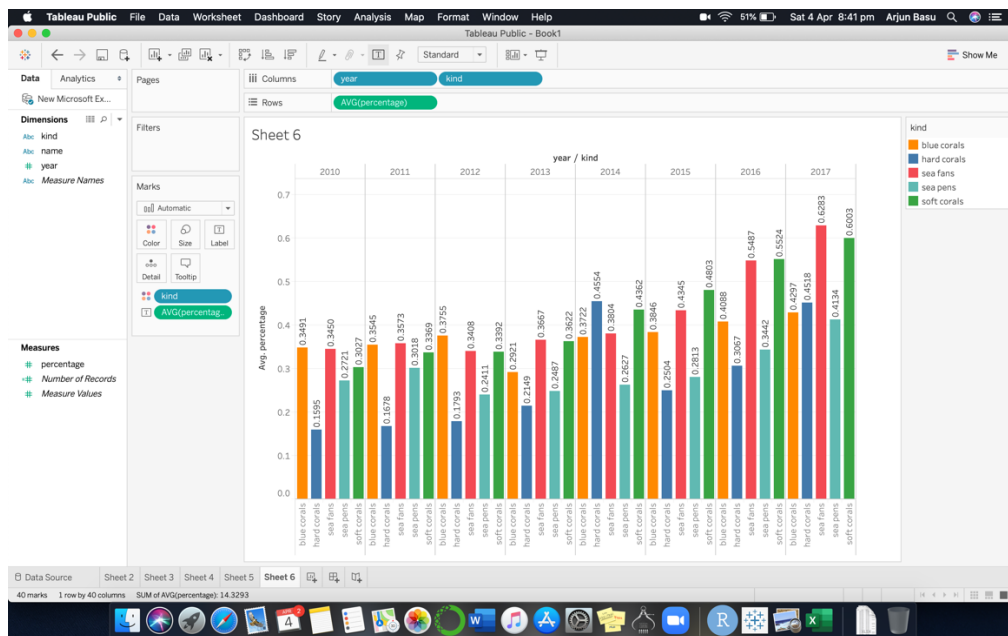
## PART B: VISUALISATION

After looking into the data we are able to answer below questions:

1. In question 1 which years and for which kinds of coral bleaching is the worst.

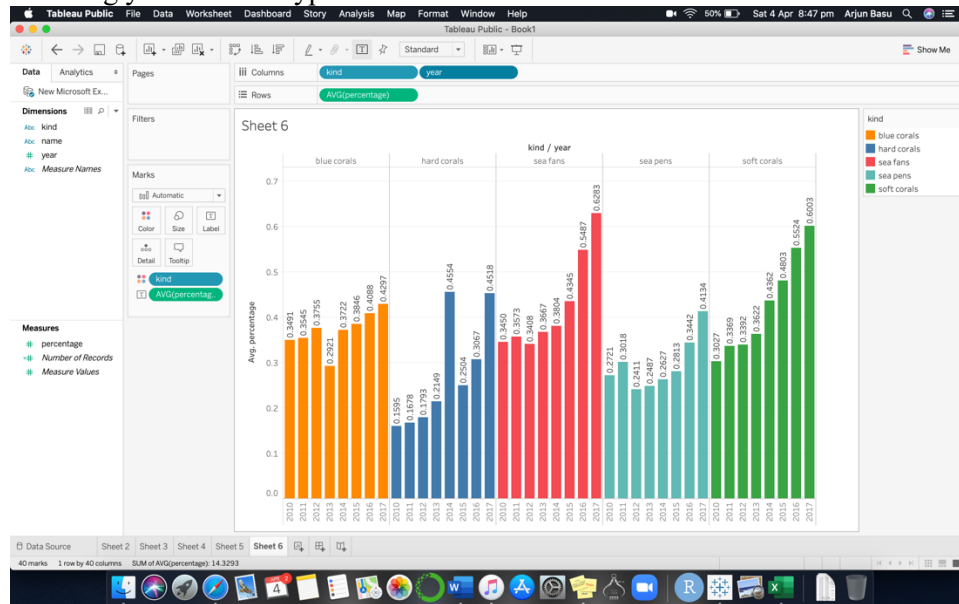
A: Dividing the question in two parts::

From the plot below please find the worst bleaching of coral in each year as follows:

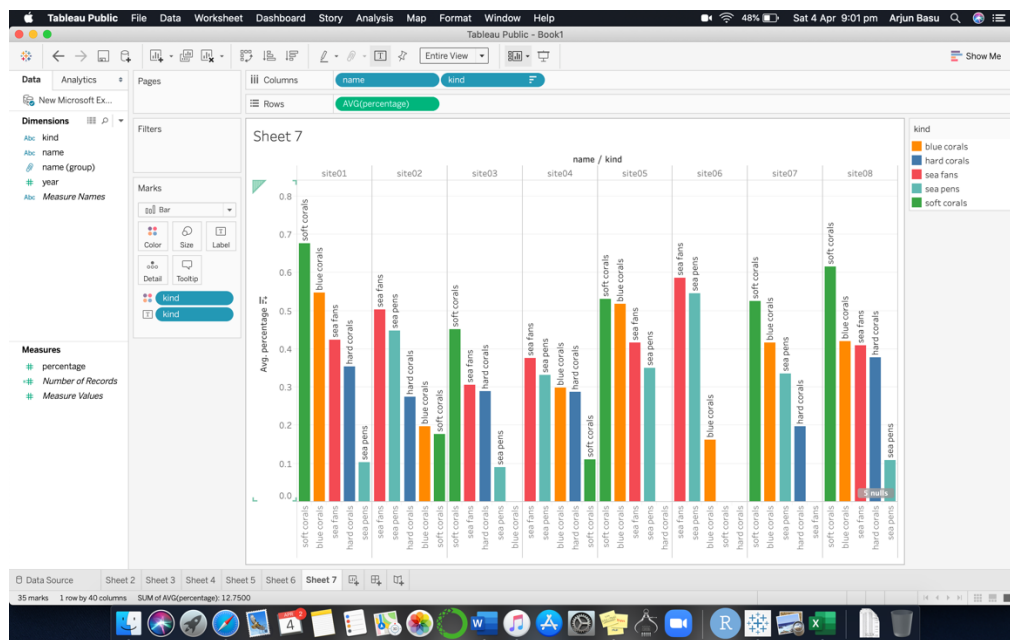


Year	Type of coral
2010	Blue
2011	Sea Fans
2012	Blue
2013	Sea Fans
2014	Soft
2015	Soft
2016	Soft
2017	Sea Fans

Secondly, if we shift the year dimension in the columns field to the left, we can observe that the worst coral bleaching year for each type is 2017.



Q2) Now, we can find the type of coral having worst bleaching by adding the name dimension instead of year in the columns field:



Site no.	Worst coral bleaching
Site 1	Soft corals
Site 2	Sea fans
Site 3	Soft corals

Site 4	Sea fans
Site 5	Soft corals
Site 6	Sea fans
Site 7	Soft corals
Site 8	Soft corals

From the below line plot, we can further see that as the sites moves away from the shore, the bleaching decreases.

