

#dataart

CSC 591, Spring 2020

Team

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Client

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Figure: The 4 by 15 sq.ft. screen at SAS HQ for Data Art

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Lalima

Existing Project and Ideas ([Slides](#))

1. Jill Pelto's Art Gallery: https://www.youtube.com/watch?v=2N_owJdj-LM
 - a. Website: <http://www.jillpelto.com/>
 - b. This artwork is mainly based on climate change and showcases scientific climate data using art inspiring people to understand the significance of the climatic changes and take action on it.
 - c. It clearly depicts the positive and the negative issues of climate change and the reality of our current ecosystems including melting glaciers, rising sea level, threatened species etc.
2. Dear Data by Giorgia Lupi and Stefanie Posavec: <https://youtu.be/iqaVe1MCTIA>
 - a. Website: <http://www.dear-data.com/theproject>
 - b. A weekly gallery of artwork focussing on different things such as productivity, schedules, compliments and recognition to track progress (read [Interview](#))
 - c. A simple art form that beautifully describes data - in one case, the day-to-day activities of the artists.
 - d. Inspires to keep track of the day, improve your productivity and keep up the good work.
 - e. One drawback could be that this kind of visualise would require extensive use of symbols and hence an elaborate key or legend.

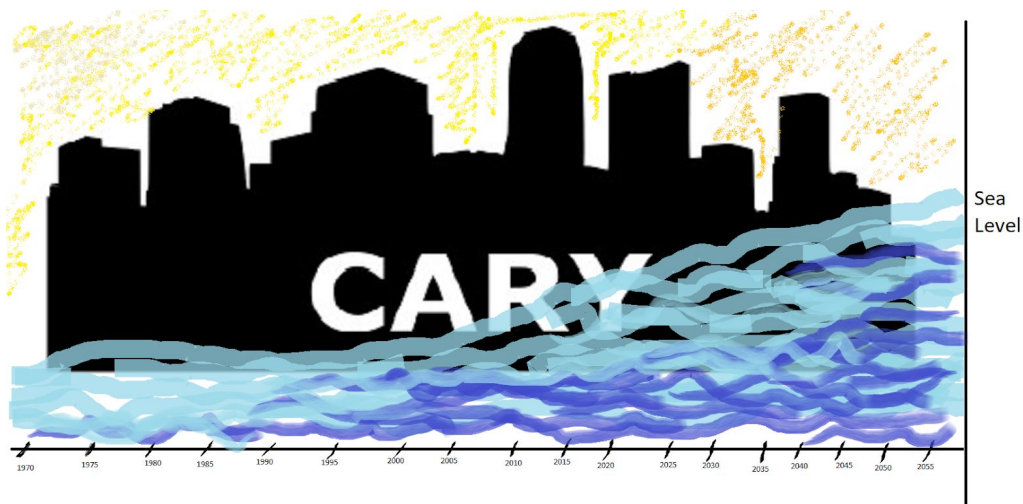
List of Ideas

1. We can visualize how global warming has affected particular SAS locations since its inception in 1976. This can be done using parameters such as the year and gradually changing average temperature over the months or a gradual change in sea level in each year. We can also add a prediction component, showing a future date and the sea level at that time.
2. We can also visualise how climate changes throughout the year in selected locations affect the flora and fauna in that location. For example, increase in sea-levels or water temperature could affect the population numbers of a particular aquatic species in that region.
3. Weather patterns can also be analysed to understand human behaviours. There are many research papers that have performed a study on GPS locations of mobile users over the span of a few weeks. This kind of data can be used to see the day-to-day activities of humans and how weather affects people's mobility, places they visit the most throughout the day, durations of their visits etc.

4. Depth or intensity in data can be portrayed using lighter and darker shades for colors. For example, density of a population in a region, depth of sea levels, intensity of heat etc. Brightness and color contrasts can be used to bring attention to any alarming statistics such as very low pressure in a region could cause storms, very high precipitation etc.

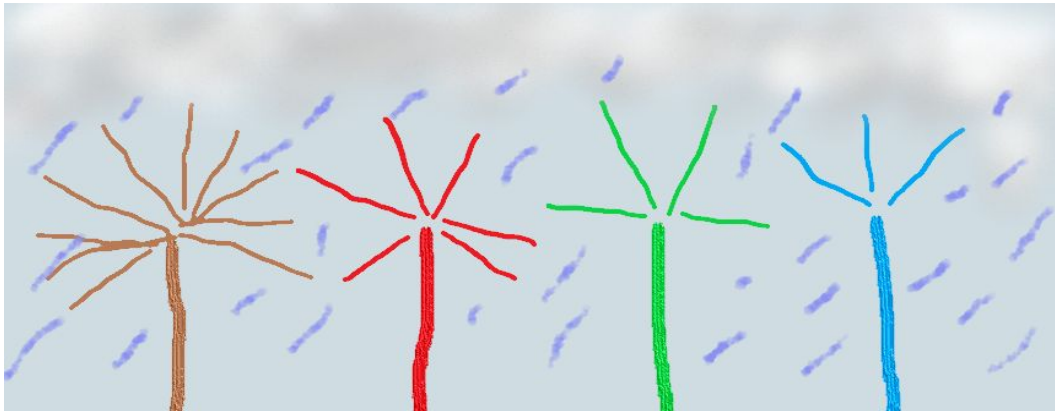
Crazy 8s

1. A sample visualization of the increasing sea levels (Y-axis) for all years since 1976(X-axis) and comparing it with the altitude of Cary above sea level (keeping it constant). It also shows a prediction of the sea level 25 years from the current time.

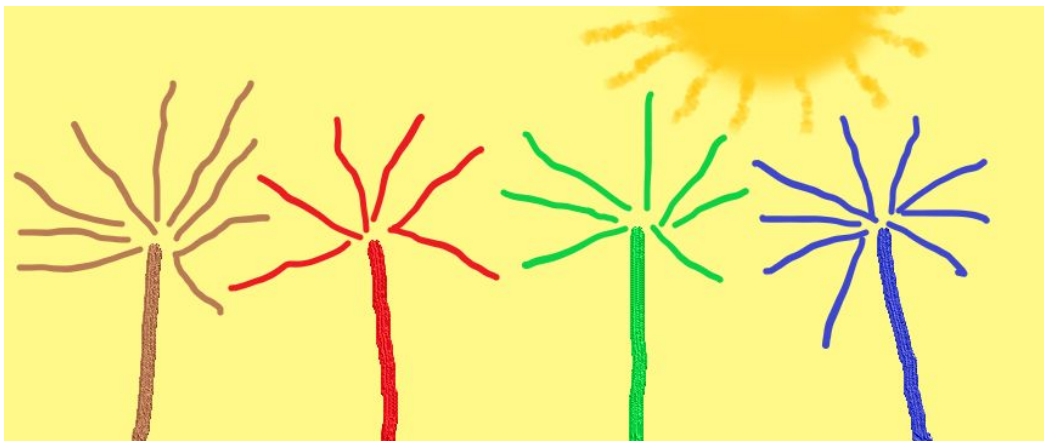


2. This visualization shows how the human behaviour changes based on the weather outside. Each individual flower represents a place of interest. The brown flower represents Cafes and Restaurants, red flower represents Movie theatres, green flower represents Parks and Gardens and the blue flower represents swimming pools and water parks. Each petal represents a number of people (say 2). The background color signifies the average temperature of the week along with some representation of the current weather outside.

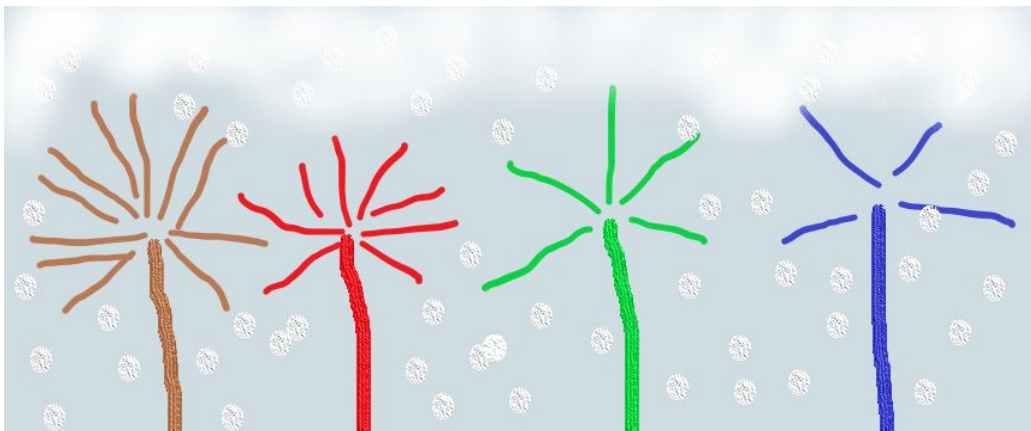
This particular visualization is a snapshot of a rainy day and shows that more people tend to visit and spend time in cafes than in a swimming pool.



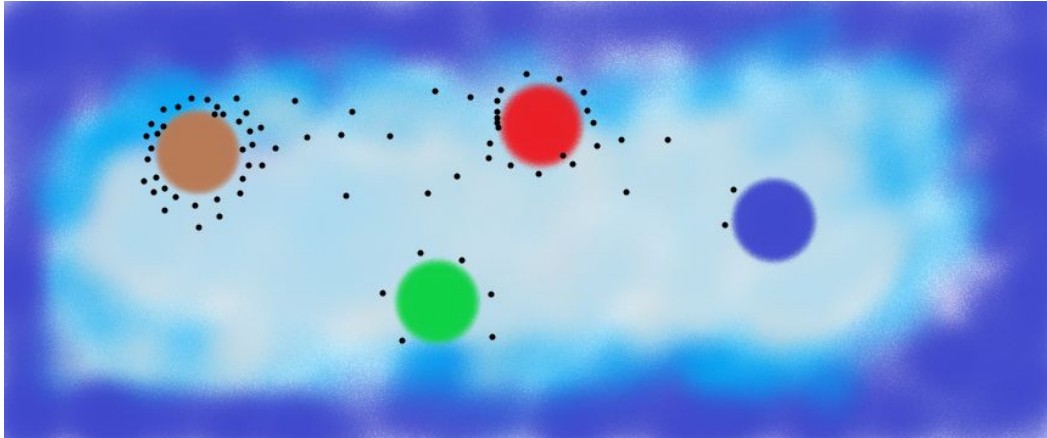
3. This follows the same legend as the above visualization but for a sunny day. The number of petals on the blue flower is more than before as people tend to go to swimming pools more often on a sunny day.



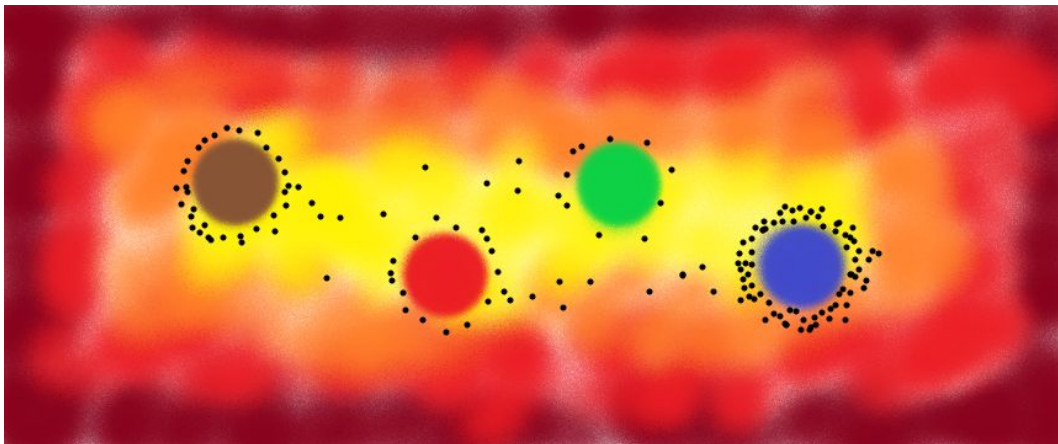
4. Following the above series, this visualization is for a winter/snowy day. The number of petals on the brown and red flowers is the most as people tend to stay indoors during snowy days.



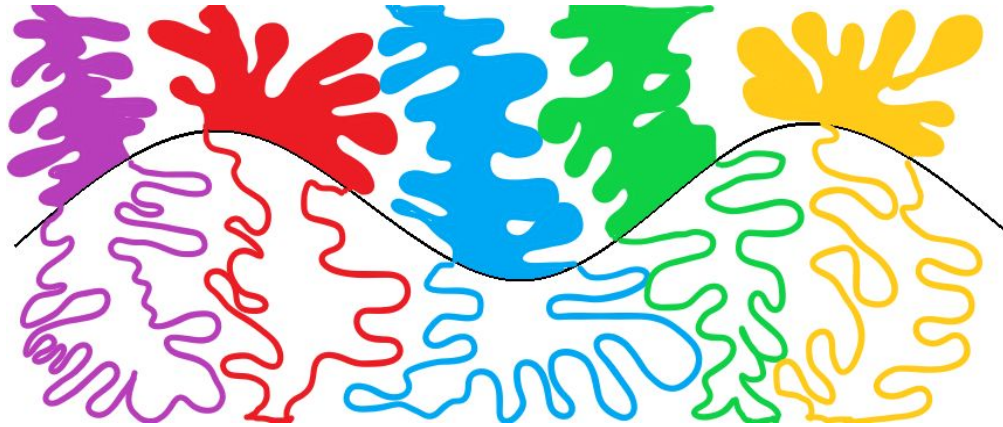
5. This visualization series follows the same topic as the previous one albeit for a few visual changes. The 4 different places are shown in the form of circles and the number of people is visualised by black dots. The background colors determine whether it is a cool or a hot day. A cold day shows more crowds in cafes and movie theatres.



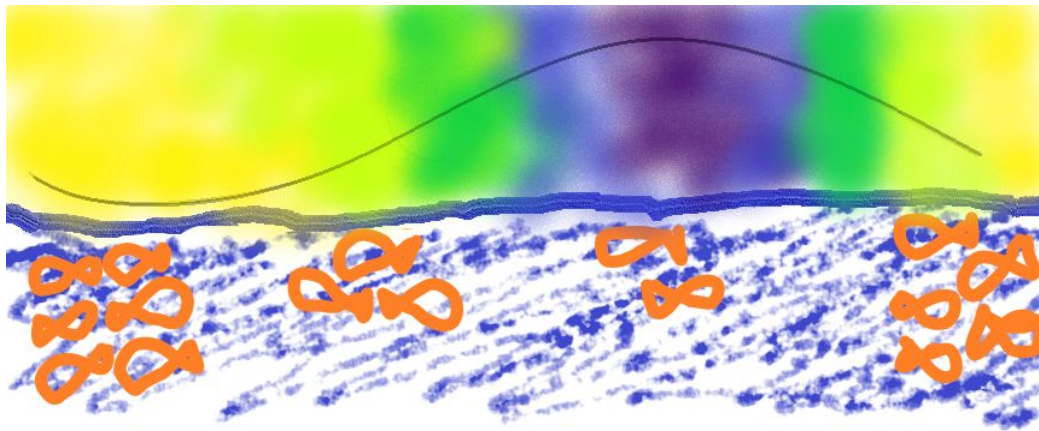
6. A hot day shows more crowds in cafes and swimming pools.



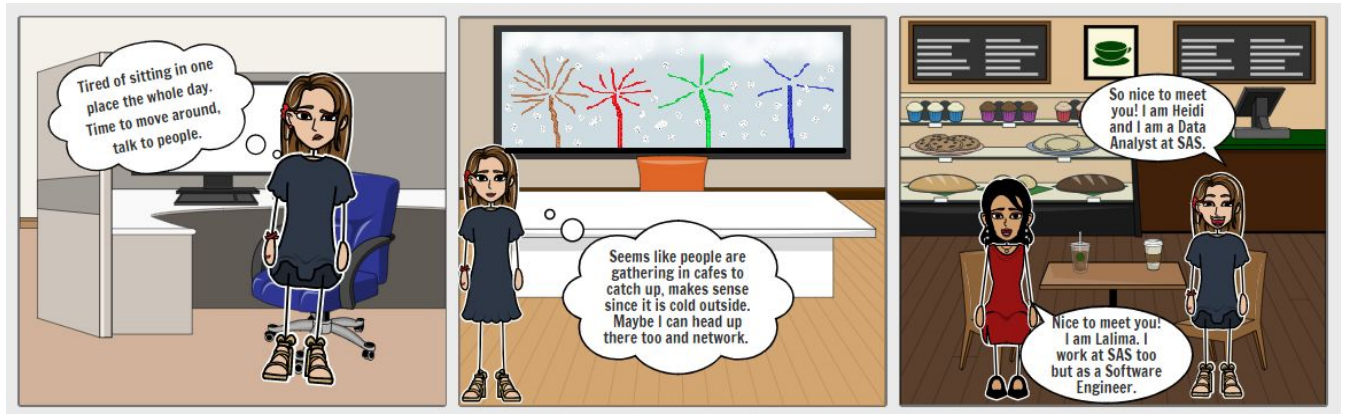
7. This visualization represents effects of climate change on coral reefs. The wavy black line displays the temperature of the ocean at a particular latitude-longitude. Scientists have reported that warming temperatures in the ocean causes thermal stress in the aquatic life and coral bleaching in coral reefs. High temperatures cause more bleaching or discoloration in reefs as below.



8. This visualization represents effects of climate change on fishes. The wavy black line displays the pH Level of the ocean at a particular latitude-longitude which changes because of change in temperature. High temperatures cause imbalances in pH levels of water (towards Red indicates acidic and towards purple indicates alkaline whereas yellow indicates a balanced pH level). Sudden changes in pH level can cause some types of fishes to die or move away from that location, hence thinning the population of that particular fish type at that location.



Storyboard



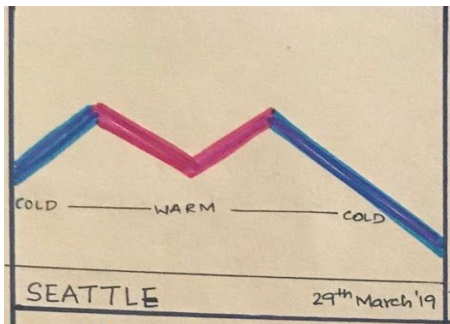
Bhoomi

Existing Project and Ideas ([Slides](#))

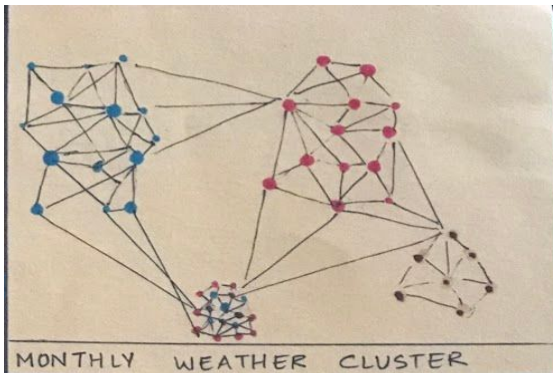
1. Metrogram3d
 - a. Website - https://www.vice.com/en_us/article/pgqkpm/tokyo-transit-looks-like-light-art-in-this-3d-visualizer
 - b. Tokyo Transit Looks Like Light Art in This 3D Visualizer
 - c. Japan's metro system pulse and glow in real time WebGL experience 'Metrogram3d.'
 - d. Japanese web developer Null Design takes data from the Tokyo Metro and transforms it into a gorgeous 3D universe of colorful pathways, glowing orbs, and a spacey journey into the aether with Metrogram3d.
 - e. In the WebGL experience, viewers can follow individual trains in real time, represented in lines that look like light paintings.
2. Vote map
 - a. <https://www.core77.com/posts/90771/A-Great-Example-of-Better-Data-Visualization-on-This-Voting-Map-GIF>
 - b. Done improperly initially, data visualization can be incredibly misleading. It's important that we have talented and hopefully unbiased designers presenting the information.
 - c. What we see in the map is how each county in the United States voted in the 2016 Presidential election (Red = Republican, Blue = Democrat).
 - d. However, it was a wildly inaccurate representation of proportionality vis-à-vis the population, because all of those little shapes representing counties have vastly different amounts of people living within them.
 - e. Data scientist Karim Douieb figured that a more accurate way to represent how people voted is to use colored dots, varied in size proportionally to the population of each county.
 - f. He turned the results into this GIF, which provides a clearer picture.

List of ideas

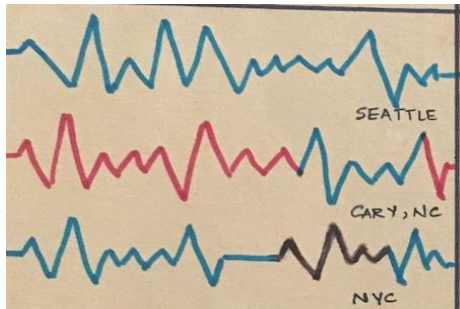
1. The fluctuating weather on a particular day is represented in the form of triangular art signals. Initially the weather was cold in the morning on 29th March '19, as the day progressed the climate changed and it got warmer and the weather turned cold again at night. The color of the signal depicts the weather (red- warm, blue-cold, black-rainy)



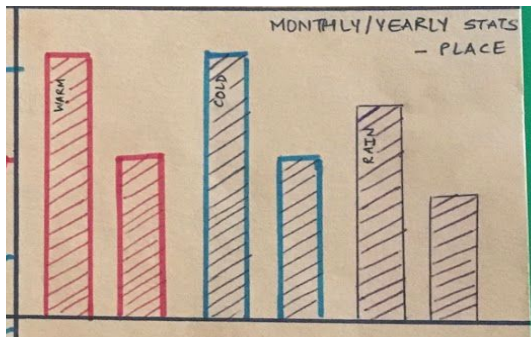
2. Clusters representing the monthly weather analysis of the places where SAS is located. From the data gathered, clusters could be formed and depicted on the dataart wall. It would give insights on how the data could be represented and analysed, and compared on a monthly basis.



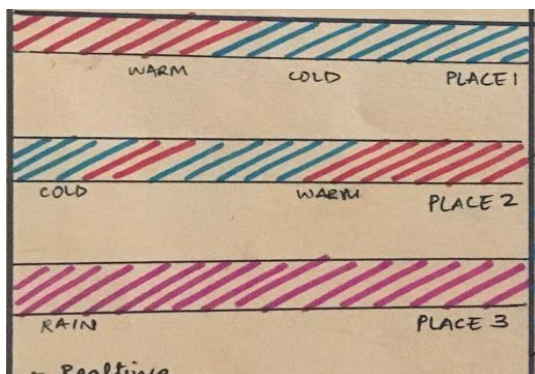
- ECG signal format weather displayed on the dataart wall of different places at that particular instance. One could have a glance at the weather conditions of three locations of SAS. In this picture, Seattle and Cary and NYC have been depicted. The waves are formed based on real time data. While it's rainy in NYC, it's cold in Seattle and Cary.



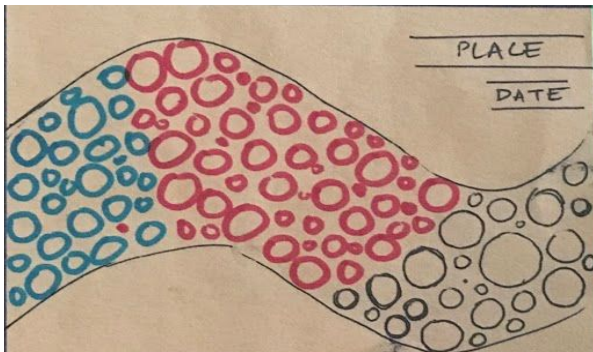
- Monthly or yearly stats of the location represented in the form of an histogram. An animation of increasing histogram size could be depicted. The color of each histogram bar changes based on the weather conditions. The histogram could be a cumulative of all the places or the screen could rotate and show histogram of each location.



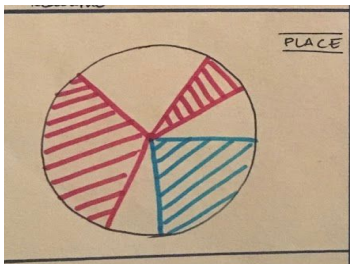
- Real Time weather data displayed on rectangular bars. The bars keep filling as the day progresses. Similar to depiction 3, the weather conditions of three locations have depicted on the screen. The animation of the bars being filled up based on weather conditions is interesting.



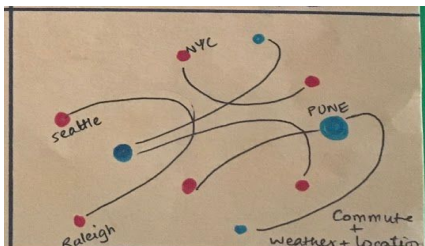
6. Data taking form of circles. The color of the circle is analogous to the weather. This idea has been chosen and depicted on the storyboard.



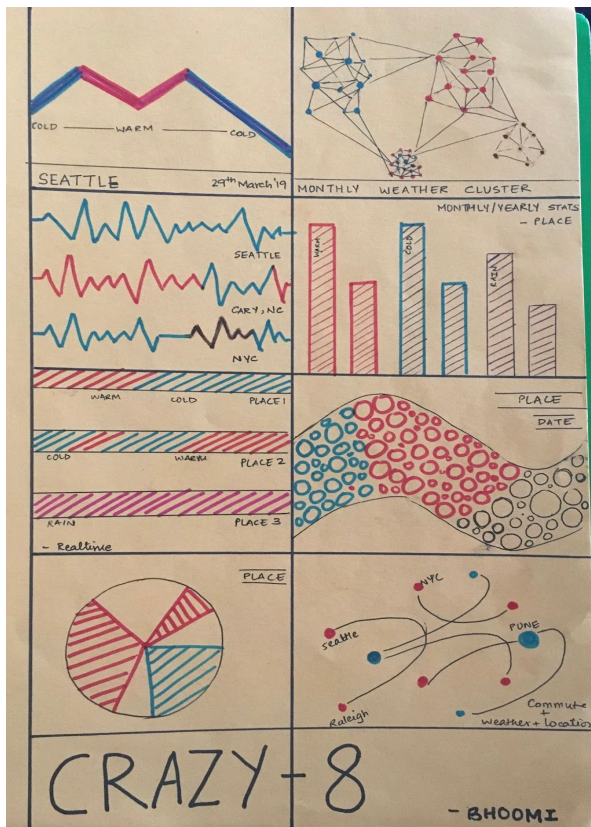
7. Pie chart representation of data. The climate conditions could be depicted using a pie-chart. It could be weekly, monthly or yearly.



8. An inspiration from 'metrogam3d' where all the SAS locations are connected and the color of the node represents the weather of the place at that instance.



Crazy 8s



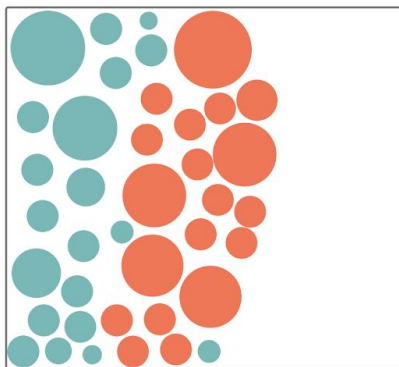
Storyboard

Storyboard is created based on the 6th idea:

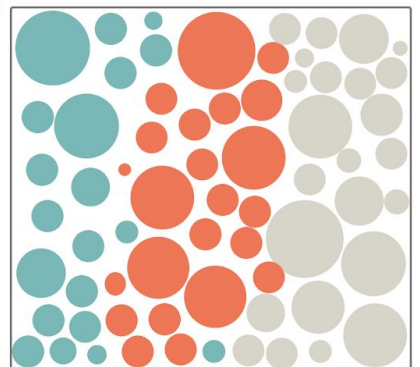
Name: DataArt



Scene 1



Scene 2



Scene3

The scenes depicted in the storyboard is the idea that I chose from my crazy8.

The first scene depicts that the temperature has been cold till a particular instant of a day. The blue bubbles mark that the morning was chilly. As the day progresses, the afternoon gets warmer and the wall gets filled with orange/red bubbles. In the night, it gets rainy and the wall is filled with white bubbles. The background of the wall also changes based on the time of the day. Sky blue for the morning and dark blue for the night.

Jaydip

Existing Project and Ideas

1. Windy.com: <https://www.windy.com/>

1. Different animations depicting appropriate weather conditions and color combinations to represent temperatures.
2. Option for a continuous animation to cover a timely prediction for a day.

The effort to develop multiple features similar to what this website provides is much more than our timeline, the UI is very rich with different animations which might not be related to the information we want to convey.

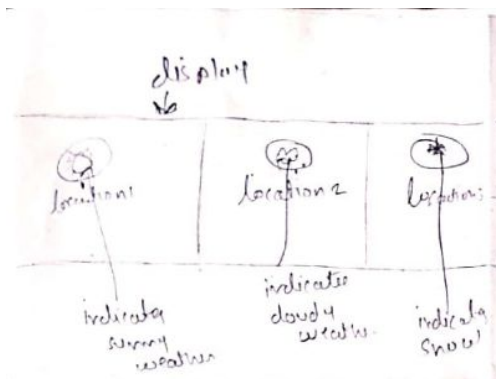
2. Darksky.net: <https://darksky.net/>

1. Different conditions are represented with only colors and arrows for directions.
2. The information is conveyed with written text below the map. The map itself is not self-explanatory and needs some additional information to be interpreted.

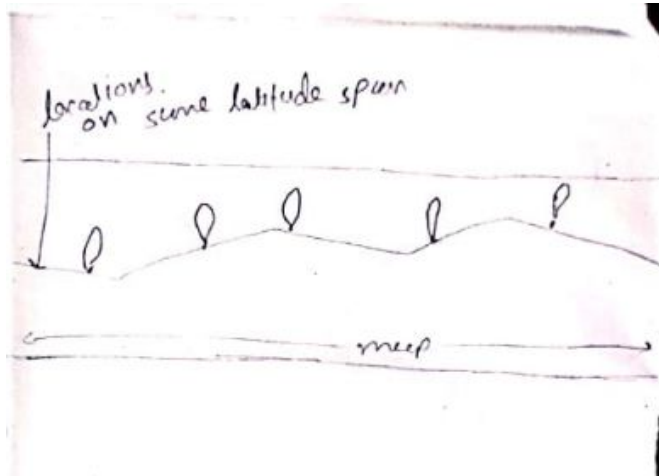
We aim to make the visualization self-explanatory so that it could be interpreted by just looking at it.

List of Ideas

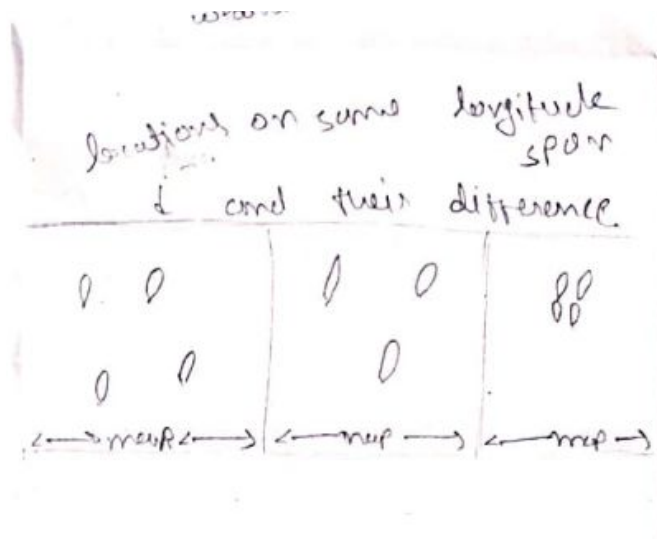
1. Display information of multiple locations simultaneously by dividing the scene horizontally. With the use of proper symbolic animations or graphics, the weather condition for any location can accurately be conveyed.



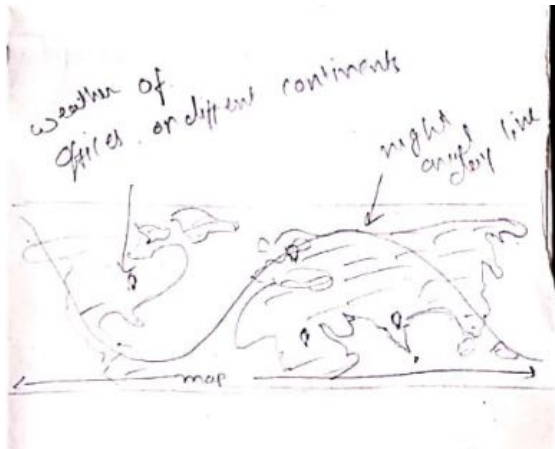
2. Connect SAS locations with the same latitude span with a line and put markers on it. These locations can have animations depicting current weather in the respective region to grasp change in climate over different longitude with similar latitude.



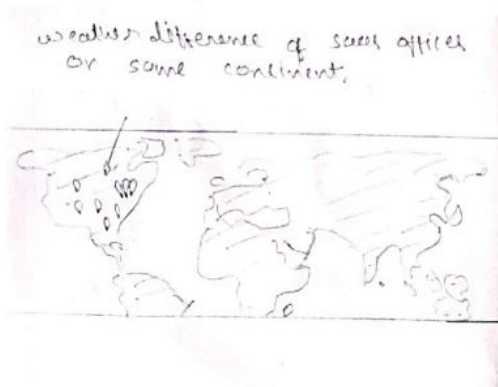
3. Divide the screen horizontally to represent weather conditions of SAS offices that are in the same longitude span over latitudes.



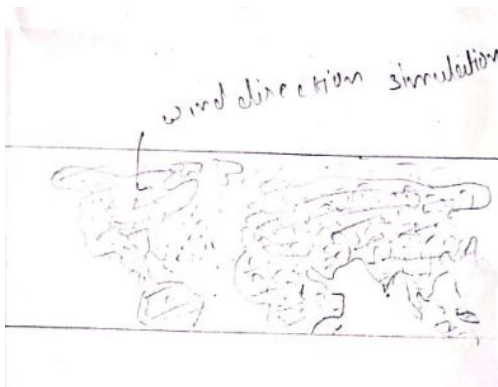
4. Display an infographic map with day and night terminator and makers on the region where SAS is located on different continents to grasp the change in conditions in weather across different continents.



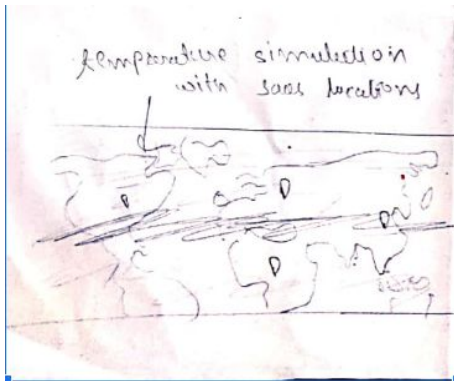
5. Display an infographic map with makers on the region where SAS is located in the same continent to grasp the change in conditions in weather within the same continent.



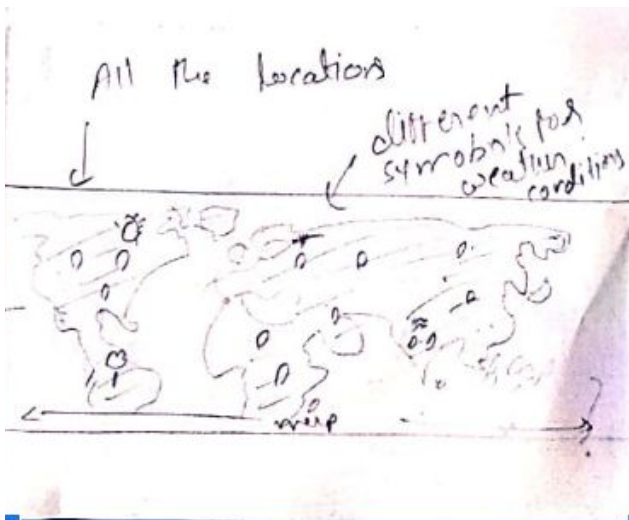
6. Display a wind simulation worldwide.



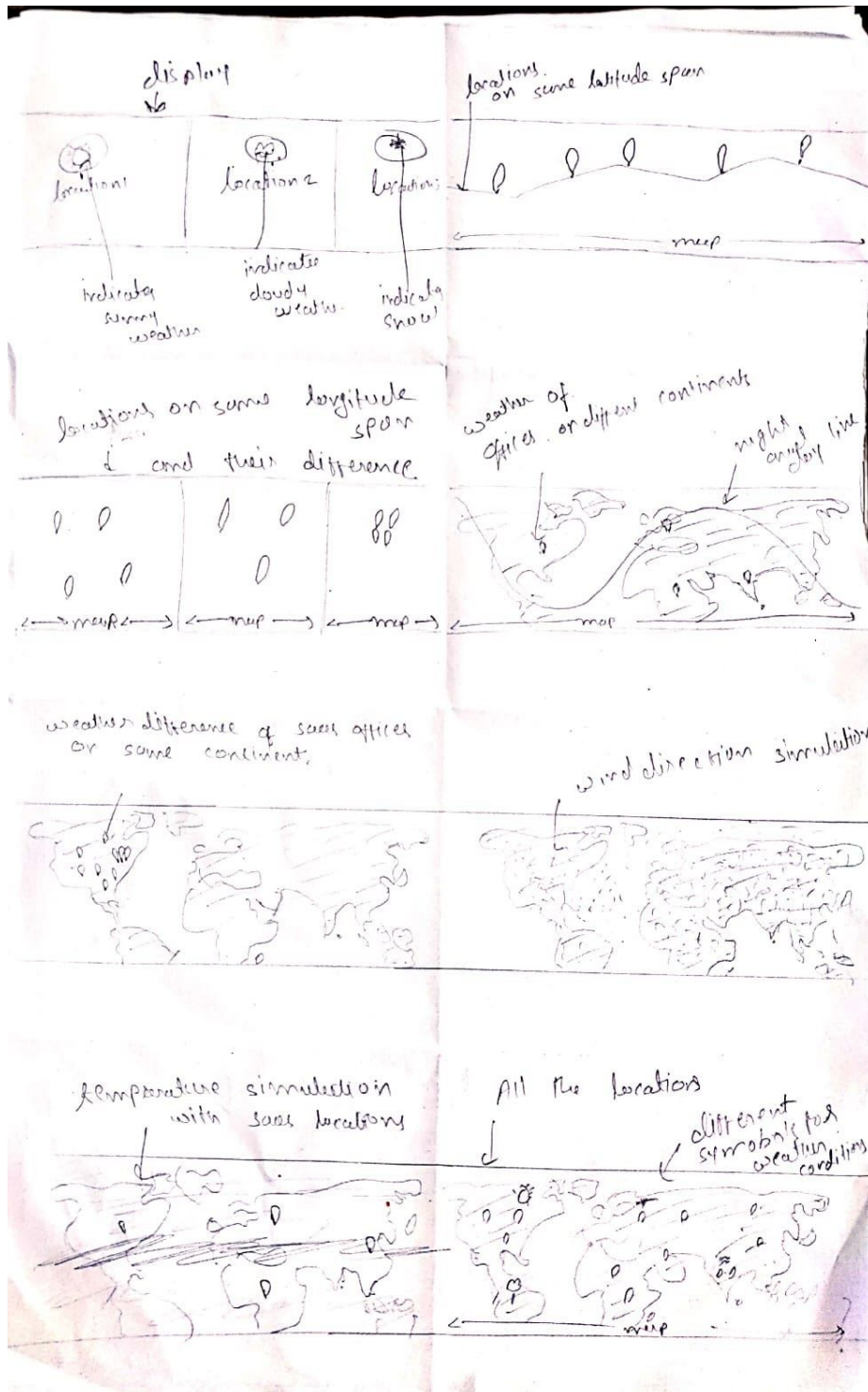
7. Display a map with different shades of red, green, blue to depict temperature across the globe.



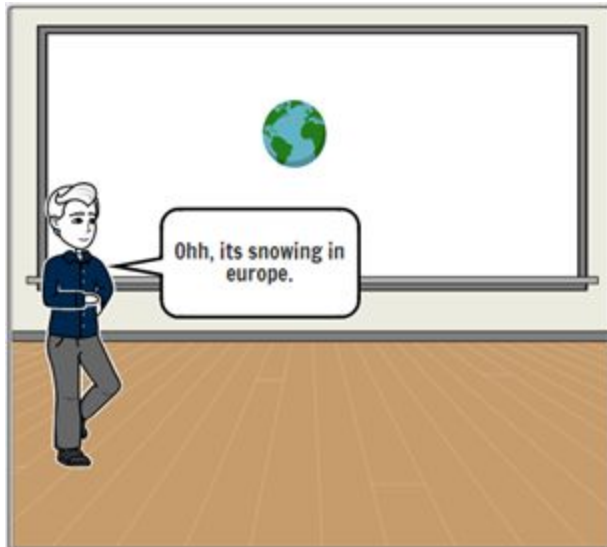
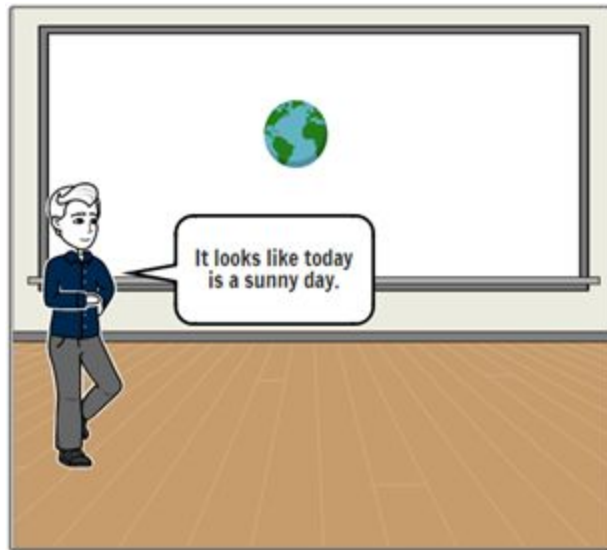
8. Display all locations with appropriate symbols and animations across the globe.



Crazy 8s



Storyboard



Amogh

Existing Project and Ideas ([Slides](#))

1. Salesforce Tower, SF
 - a. From sunset to sunrise, it features a lightshow on the glass panels of its top 6 floors - lights are usually blue, white, and feature human outlines in black, and are visible from upto 20 miles away.
 - b. captures attention, is at a large scale in comparison to similar work (the size of the display at SAS is really huge compared to similar regular screens) and has content that moves (sourced from cameras installed across the city capturing different elements of the city of SF) and means something for the local audience
 - c. Fleeting, ephemeral images are an ode to the city's vibrancy and energy
 - d. The installation can also be used to observe important dates or events in an artistic manner - Example: Eye of Sauron during Halloween
2. Bay Lights (San Francisco-Oakland Bay bridge)
 - a. Arrangement of lights flowing in a pattern - (think: SAS sculpture)
 - b. 25k LED lights, meant for feel-good experience - I can personally vouch for it!
 - c. Art, emotional arousal, and scale
 - d. Been used by researchers to conclude that "Experiences of awe and beauty have all round health benefits"

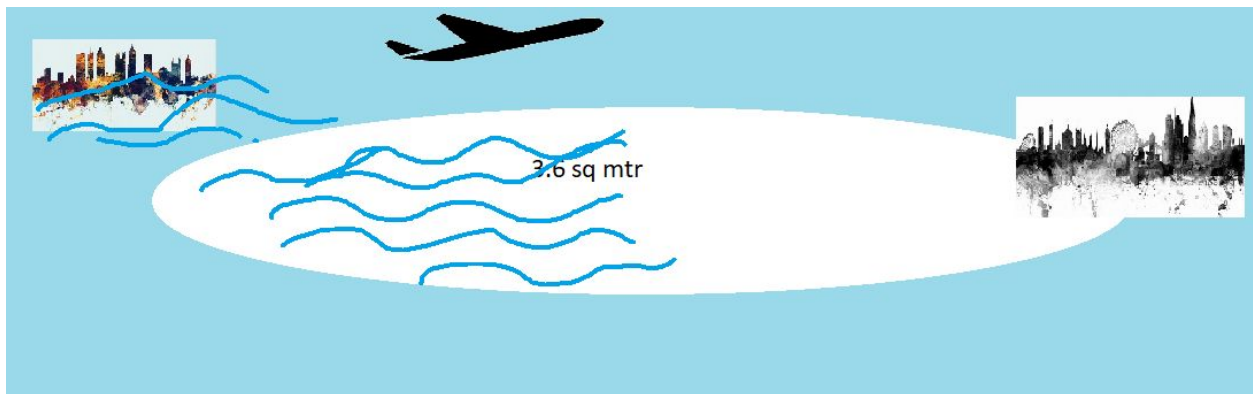
List of Ideas

1. Impact of flight travel on the environment: For example, a one-way trip from RDU to LHR in Economy is equivalent to a loss of 3.6m² of Arctic ice. And the CO₂ emission from this 1 flight is equivalent to what an average person emits annually, in multiple countries combined. This data can be depicted on the screen.
2. Animals displaced: Show pictures of animals in a surrounding that it totally does not belong to. More absurd the picture, stronger is the message that this can be an eventual effect of climate change.
3. Effect of sea levels, temperature: We personify nature as an orb (ball) that moves from left to right, and strikes a skyline to achieve a destructive effect.
At first, it is small in size and has a smiling face and is colored blue. As it moves to the right, its size grows, face gets angrier, and color changes to red before it strikes the skyline. The size of the orb represents rising sea level, color represents the average temperature of the city/earth, and striking the skyline represents how cities would get affected.

4. Weather stripes: Show the increase in average temperature of cities (office locations) around the world and throughout the years, in the form of colored stripes. Add transparent water bubbles and water drops to indicate rising sea levels and amount of rainfall on the day.
5. Daily weather recap of every year at every SAS location: Show sunlight level, temperature and weather.

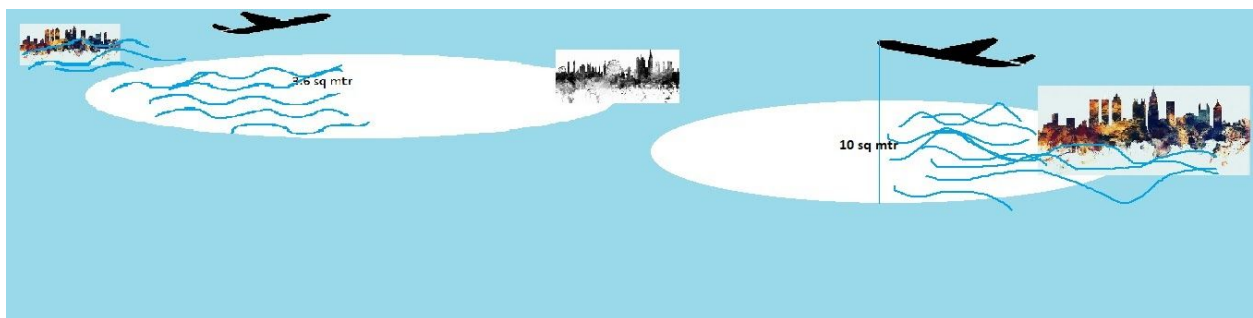
Crazy 8s

1. Based on Idea 1:



We can show a large, deep plate of ice with RDU (Raleigh) on the left end and LHR (London) on the right, and an aeroplane moving. As it moves, all the ice melts into water while the start city is shown to be submerging underwater. This can be repeated for all the popular flight routes around the world. The idea is to show rising sea levels. By the time the flight reaches LHR on the right, the white section of the picture is gone and replaced by blue (water).

2. Based on the above idea, extended for multiple flights between many cities:



3. Based on Idea 1:



A flight from Raleigh to Mumbai generates ~2600 kg of CO₂. In the highlighted countries, the average person emits less than that amount per year. This visualization can be shown for many such flight routes - maybe routes that SAS employees travel frequently.

4. Based on Idea 3



The bubble (nature) moves in a wave-like manner. Horizontal movement represents time / years. It gets bigger and angrier as it progresses.

5. Based on Idea 4



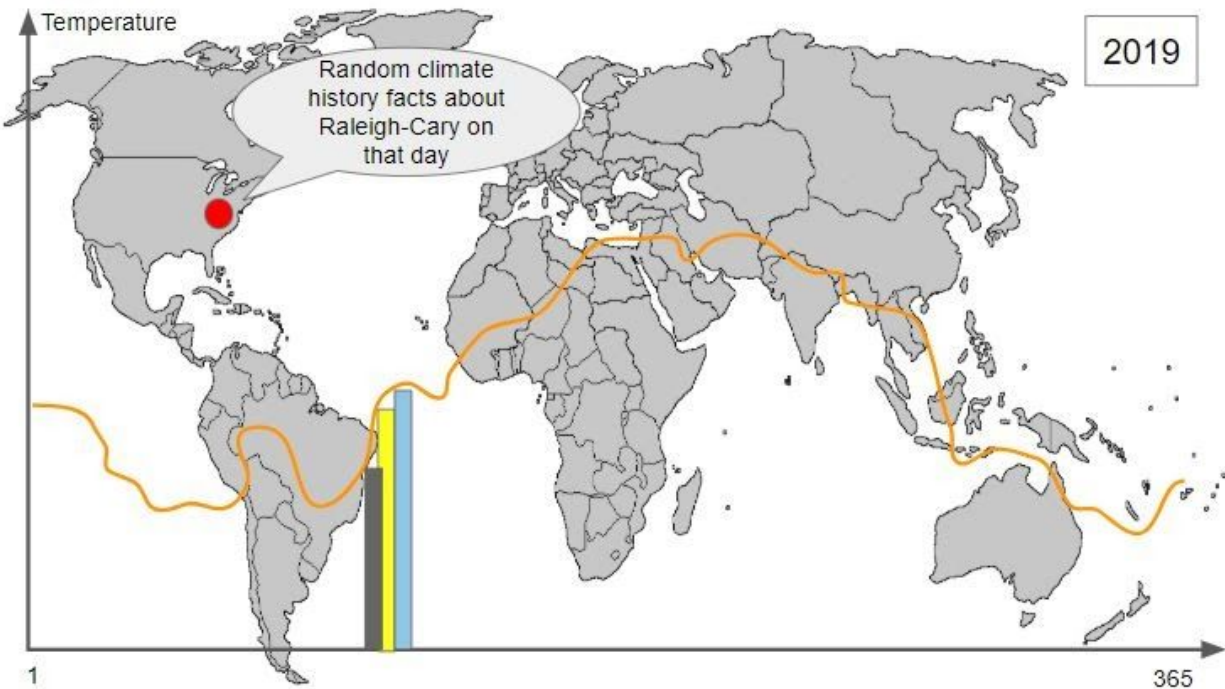
Horizontally, interpret this as years (~past 100 years). The planet gets hotter (blue lines turn to red) and sea levels (bubbles) rise.

6. Based on Idea 4:



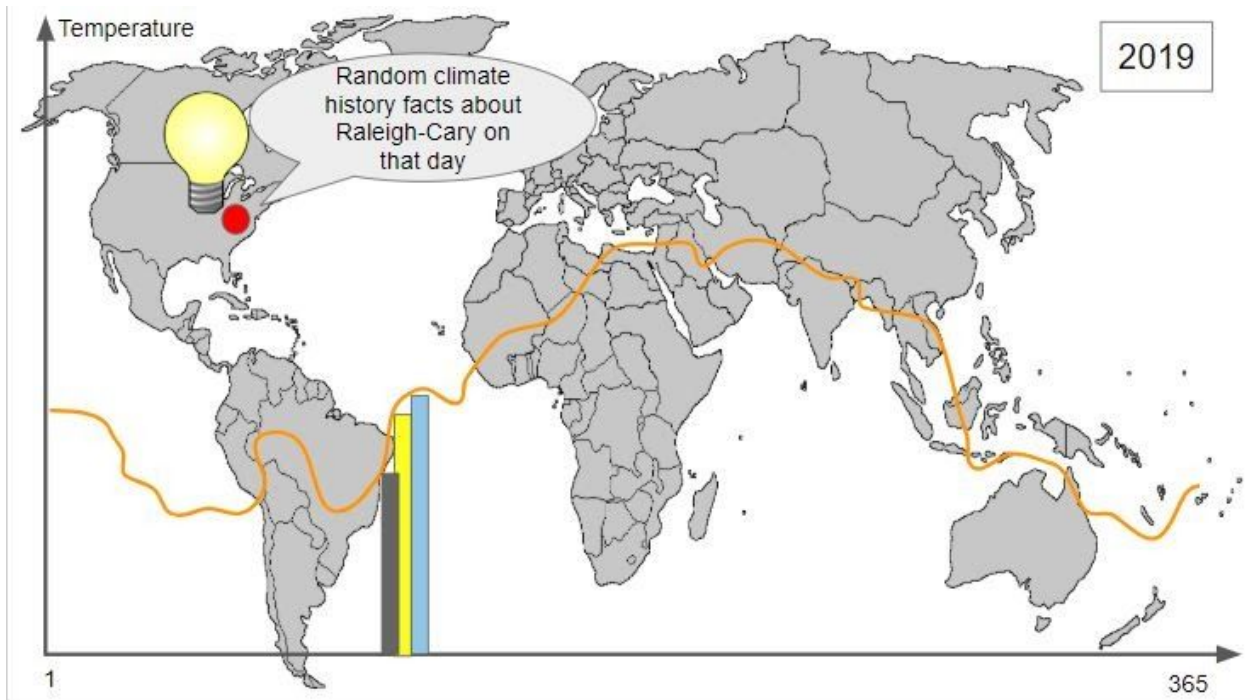
Horizontally, interpret this as hours of the day. Against the backdrop of temperature on a given date, depict whether and when it rained on that day. The direction of raindrops show wind direction (West to East in above).

7. Based on Idea 5:



Each date is brought to attention and stays in focus for about X seconds by making that day's vertical line bright and the rest of the picture dim. The line colors represent the level of sunlight: Cloudy, Sunny, Ambient. Above the scribbled line, the background will be colored for sun, rain, snow, wind depending on that day's history. The chat bubble will contain text telling what climate related news happened that day. Background to the chat bubble will be something about that day's news - like a bright sunny day, or an overflowing river. This can be repeated for every SAS location, and for every year of our dataset.

8. Relate weather data to solar farm output:



Extension of the above idea: Glow/brightness of the bulb represents the amount of power generated at the SAS solar farm on that day.

Storyboard

Storyboard is based on the first 2 ideas of the Crazy 8s.



Sruthi

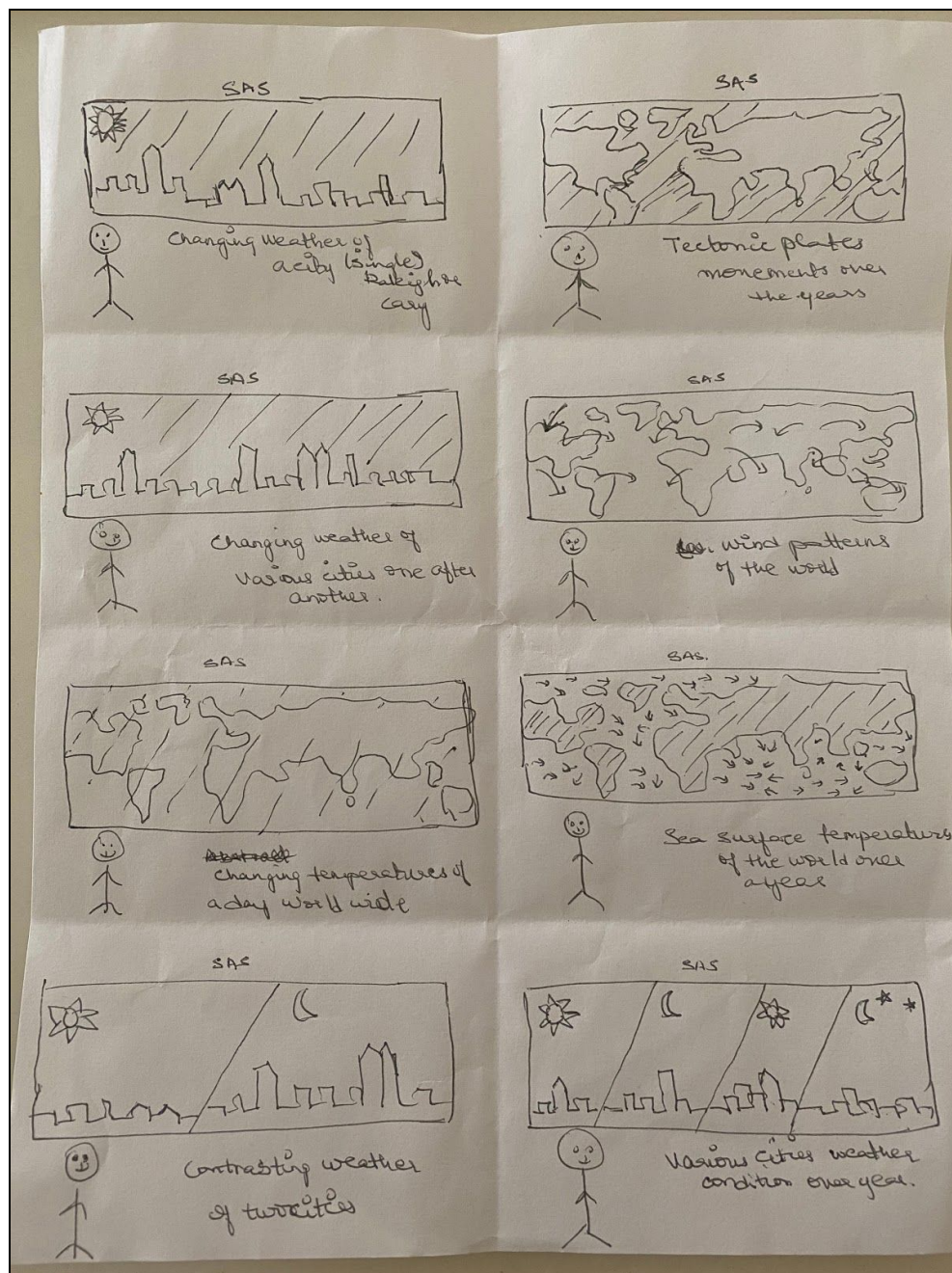
Existing Project and Ideas ([Slides](#))

1. Generative Art:
 - a. <https://www.data-imaginist.com/art>
 - b. Thomas Lin Pederson is a generative artist focusing mainly on exploring the beauty of dynamic systems.
 - c. He creates all his systems and visualisations are programmed in R.
 - d. Mixing and matching existing systems and visualisation methods as well as developing new ones over time is the cornerstone of making generative art.
2. Flight Patterns :
 - a. <http://www.aaronkoblin.com/work/flightpatterns/index.html>
 - b. Aaron is the Co-founder and President of Within, a virtual and augmented reality company.
 - c. The Flight Patterns visualizations are the result of experiments leading to the project Celestial Mechanics by Scott Hessels and Gabriel Dunne. FAA data was parsed and plotted using the Processing programming environment. The frames were composed with Adobe After Effects and/or Maya.

List of Ideas

1. Wind Patterns: The wind patterns of the world for a certain time interval like 1 year can be processed in the form of rays and displayed. The pattern movement can be fast forwarded and kept in a loop.
2. Tectonic Plates: The world map can be made in an art form and the movement of the tectonic plates can be animated, this shows the disturbances, formations of continents and can be captivating.
3. Background of skyline: The changes in the temperature in a year can be run in a loop for Raleigh in the background in the form of various colours with a city skyline in the foreground in complete black. The colour scheme is chosen according to the temperatures hence creating a changing scheme over a year time.
4. Weather for various Cities: The weather data of a year can be displayed for 4 cities simultaneously with city name or skyline as a theme and show the weather. The difference in weather in cities can be seen at once and after the loop another set of cities can be displayed which helps in changing display.
5. Abstract art: The world sea surface temperature or wind pattern can be converted to an abstract art using libraries from R, with a certain colour theme.

Crazy 8s



Storyboard



Masoom

Existing Project and Ideas ([Slides](#))

1. Starbucks Wall Art: [StarbucksAPP_03.mp4](#)
 - a) Website: <https://www accurat.it/works/starbucks/>
 - b) This interesting art wall is depicting Starbucks' history and coffee-making process.
 - c) It is an interactive experience through an AR app that visitors can use as a magic lens to discover three dimensional animations and additional content attached to the wall.
 - d) Contents are experienced in an immersive and visual way in the AR view and information is gathered through exploration, allowing the curious users to access more detailed info about the contents of the engraved wall.
 - e) Inspiring art that intrigues everyone to explore more about it.
2. Feltron Annual Report: <https://vimeo.com/70340564>
 - a) Website: <http://feltron.com>
 - b) This fascinating website provides various annual reports.
 - c) Inspiring innovative visualization concepts for data.

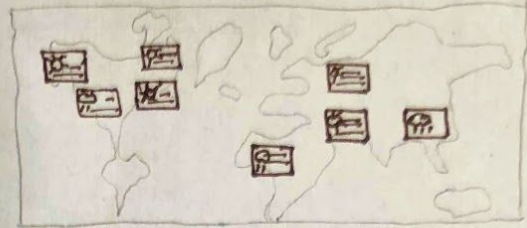
[Ideas](#)

1. Visualizing the SAS buildings' location on the world map by popping up different branches in scale based on their size.
2. Presenting the overall weather condition of branches on their popped up location.
3. Applying a specific color to each branch to be able to recognize the data based on the color.
4. Possibility to use AR to visualize weather data of branches together on the wall.
5. Focusing on US branches and showing visualized weather data on the screen in sequence based on their collaboration to the Cary branch in which the screen is.
6. Visualize each data of US branches on one chart to be comparable. For example, one chart for temperature, one for humidity and so on.
7. Using the background to show the overall weather condition of the branch that the weather information is popped up on the screen.
8. Color-based charts to show different data on a single chart.

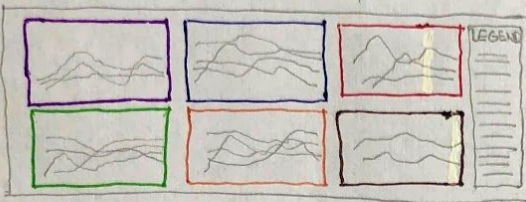
Crazy 8s



Assigning different scaled circles for different branches based on their size.

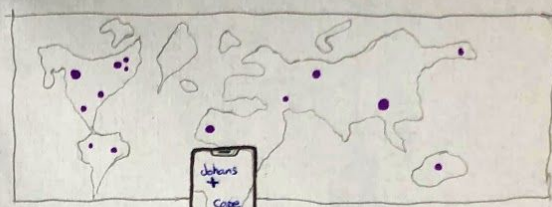


Popping up overall weather data on their assigned location.

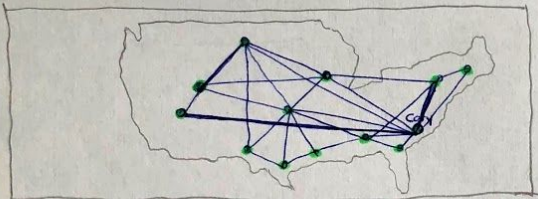


The use of color to classify branches easily via visualization.

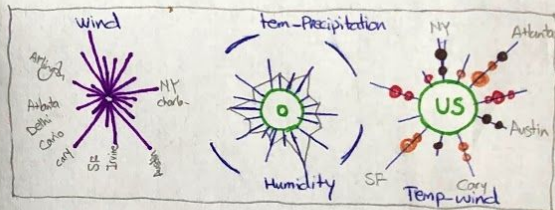
USA
CANADA
ASIA
AFRICA
EUROPE
AUSTRALIA



Using AR to get more information visualized about different branches.



Showing the detail of US branches' weather data based on the collaboration with Cary branch, for example.



Demonstrating different weather data on charts to compare them branches together.

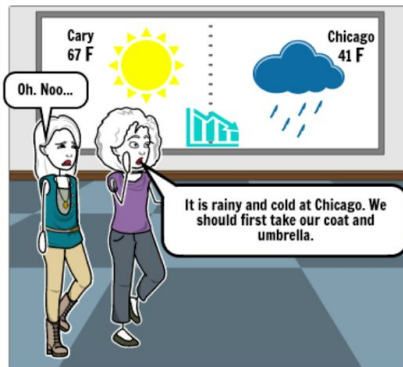


Showing overall weather condition on the screen's background.



color-based charts to easy understanding visualized data.

Storyboard



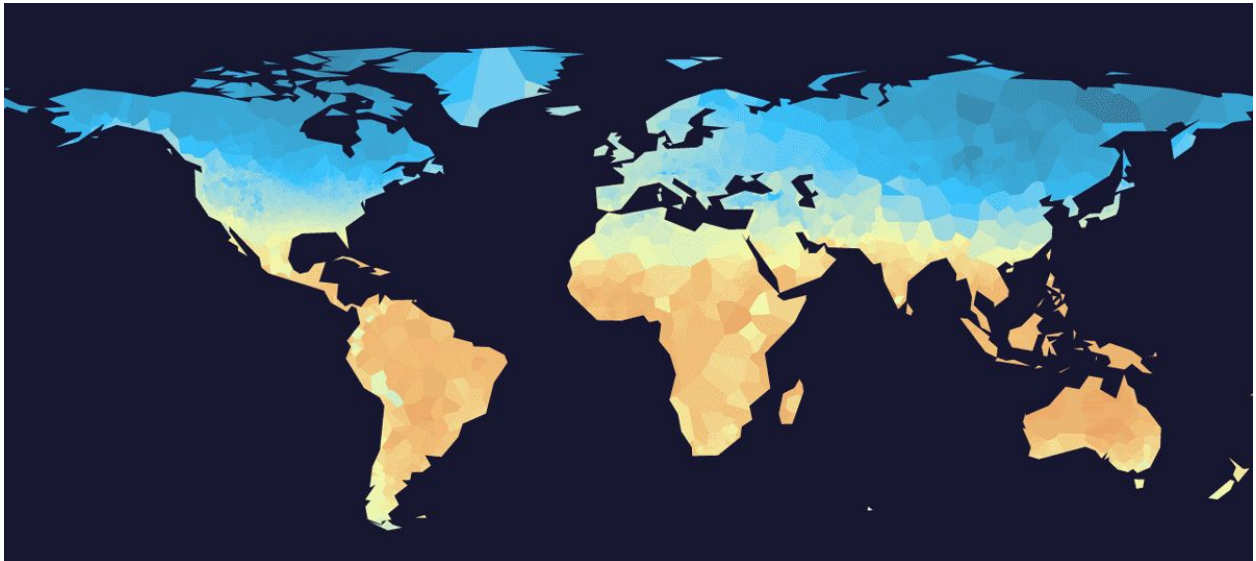
Neel

Existing Project and Ideas

1. Digital Weather Wall - Chicago
 - a. <https://vimeo.com/349728075>
 - b. This interesting digital wall displays weather data throughout the day in the form of digital art.
 - c. The wall interprets real-time local weather data and translates it into colorful abstract light patterns mimicking falling rain, billowing clouds, or sunlight streaming through trees. Eventually, ivy will grow on vertical metal trellis and bars in front of the LED displays, blending digital and natural elements.
2. Temperature Change over the years
 - a. <https://e360.yale.edu/digest/new-video-visualizes-a-century-of-global-warming-in-just-35-seconds>
 - b. In just 35 seconds, a new video illustrates how drastically temperatures in each of the world's 191 countries have changed over the last century.
 - c. The video is the latest in a string of data-based graphics visualizing the increase of global temperatures and climate change for the general public.

List of Ideas

1. We can select an office from the list of offices in a continent or country based on the size of the country and display its weather pattern in the entire continent or country. We can change the city periodically.



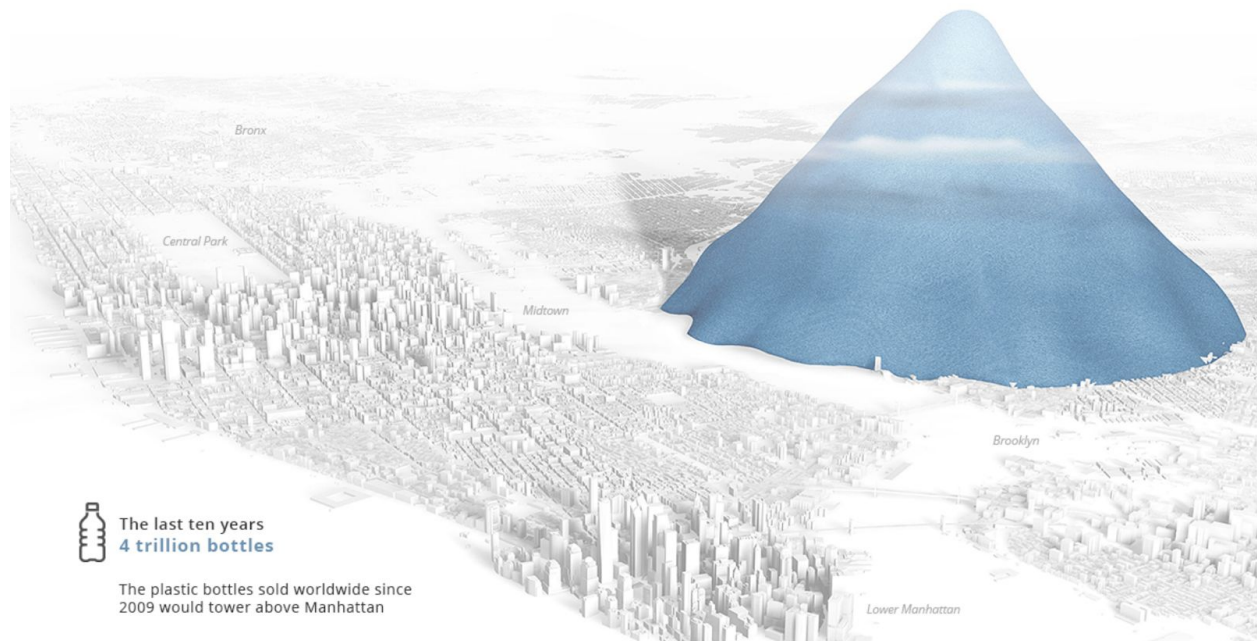
2. Temperature anomaly representation at different SAS locations with time. (<https://twitter.com/ClimateReality/status/1133867229701971972>)



3. In the above idea, instead of representing each country individually, with a timeline, we can compare and merge countries with similar anomalies together.

4. Impact of plastic waste over different SAS locations

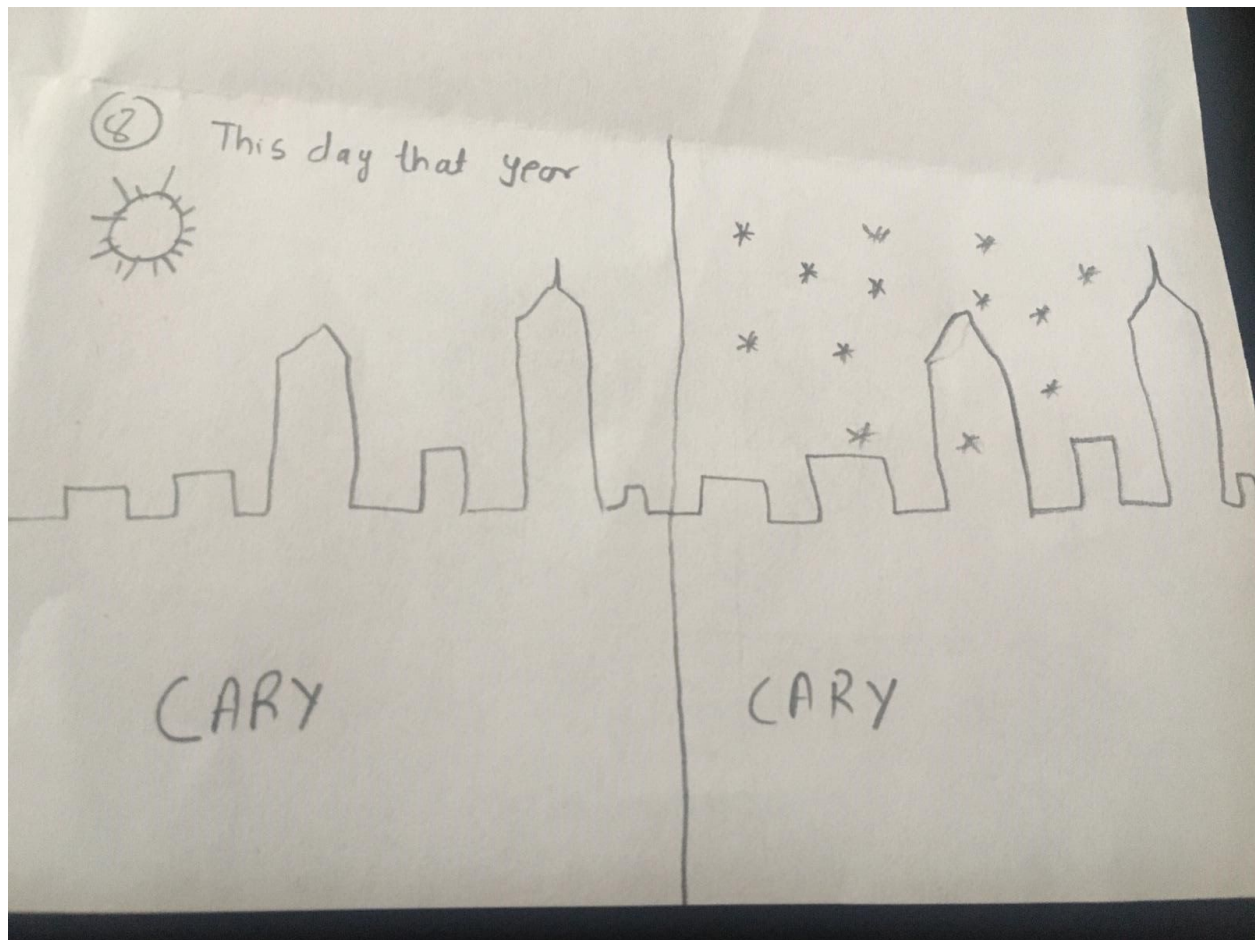
(<https://www.visualcapitalist.com/visualizing-the-scale-of-plastic-bottle-waste-against-major-land-marks/>)(<https://vimeo.com/74066023>)



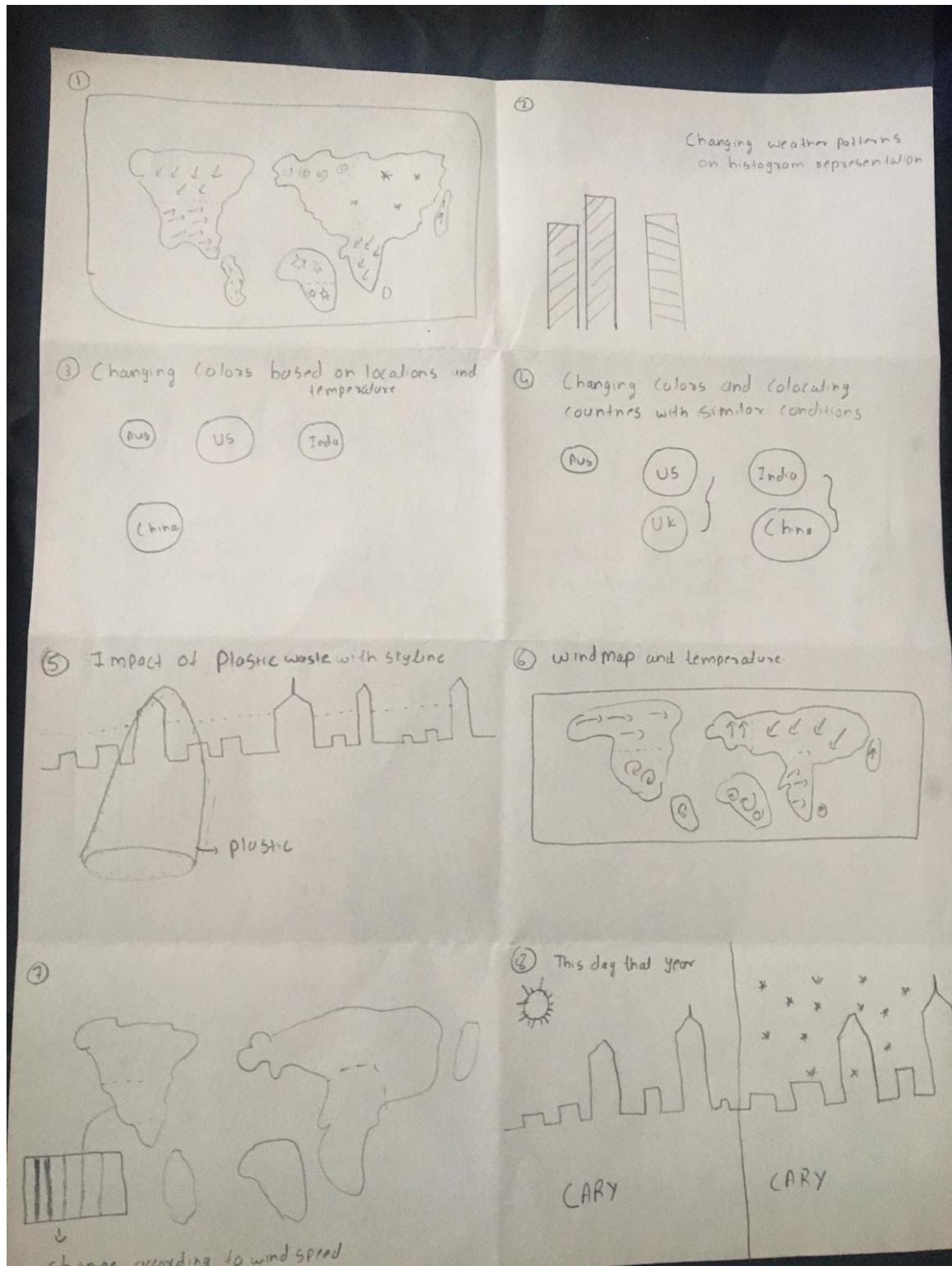
5. Weather stripes along with wind speed: Mark the SAS locations and change the stripes.



6. This day that year: We can compare the city temperature of present day with the past to get a sense of how the weather has changed over the years.



Crazy 8s



Storyboard

