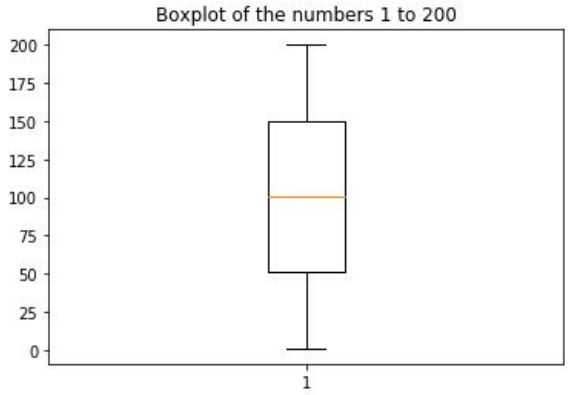
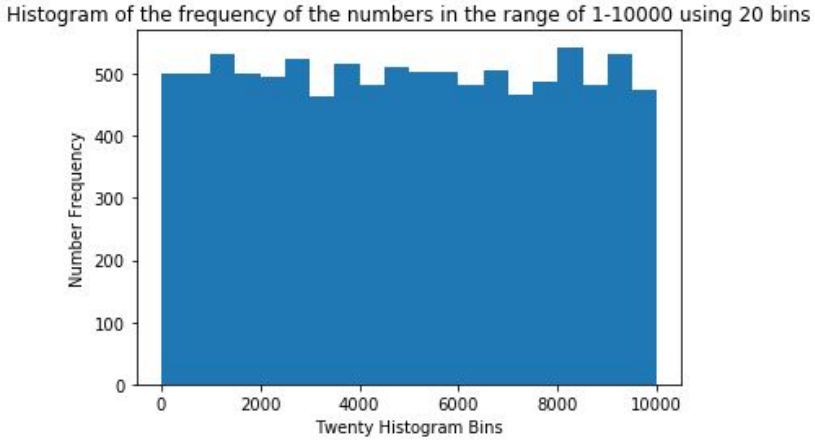
Pranav Rajan
February 10, 2021
CS 6635

Part 1: Generate your own data and visualize it

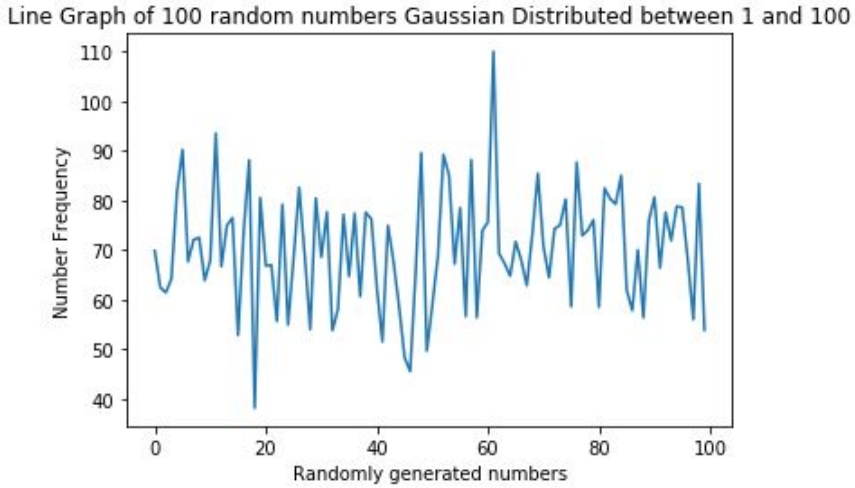
1)



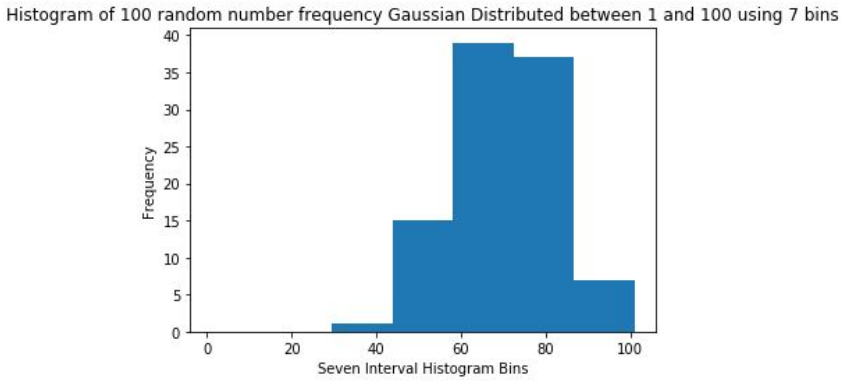
2)



3)

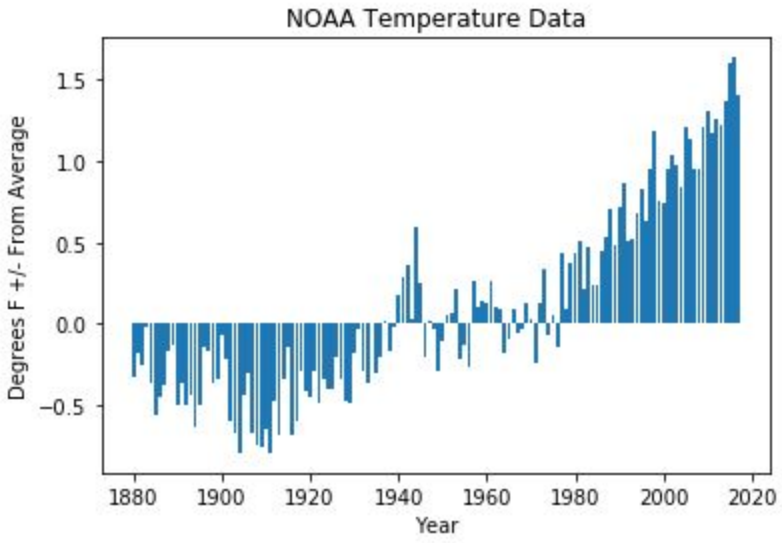


4)

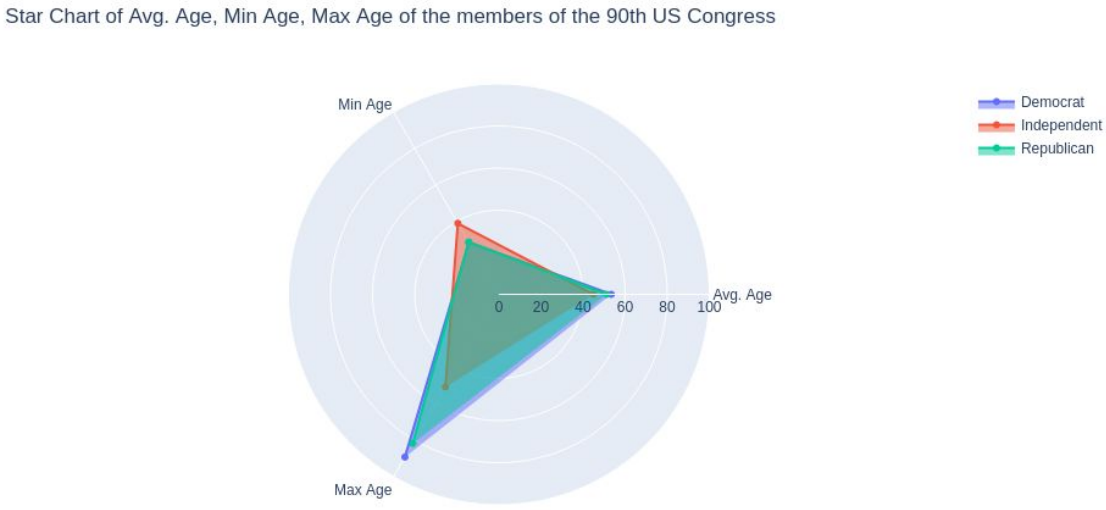


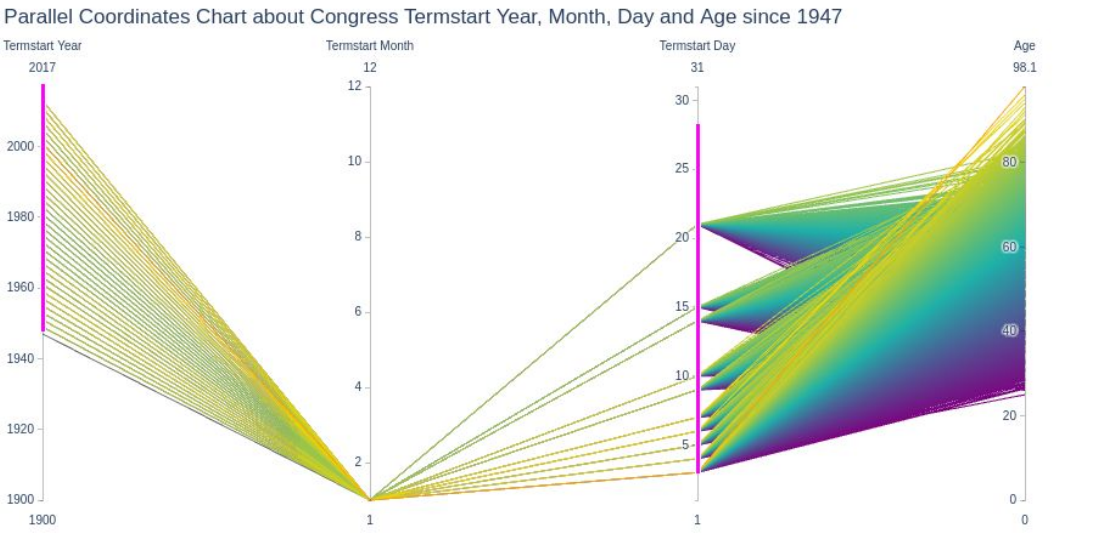
Part 2: Interesting datasets for visualization

1) One interesting trend I found in the data was that somewhere around 1940 the temperature in degrees fahrenheit was above the average for a bit before fluctuating and then increasing from 1980's onwards. One idea I have for this cause is that World War II occurred during this time period and there was more economic productivity. The 1980's upward trend makes sense as society produces more goods and as a result temperature has increased.



2) **Star Plot:** An interesting trend I found was that the average age between democrats and republicans is relatively close whereas independents were far away. This is quite interesting for the 90th congress compared to today since I would say that the democrats, republicans and independents would be close in age since many of our representatives are in 60+ range. **Parallel Coordinates:** An interesting observation was that all the congress people started their terms in january but had varying start days.





3) Min Birth Trends per month

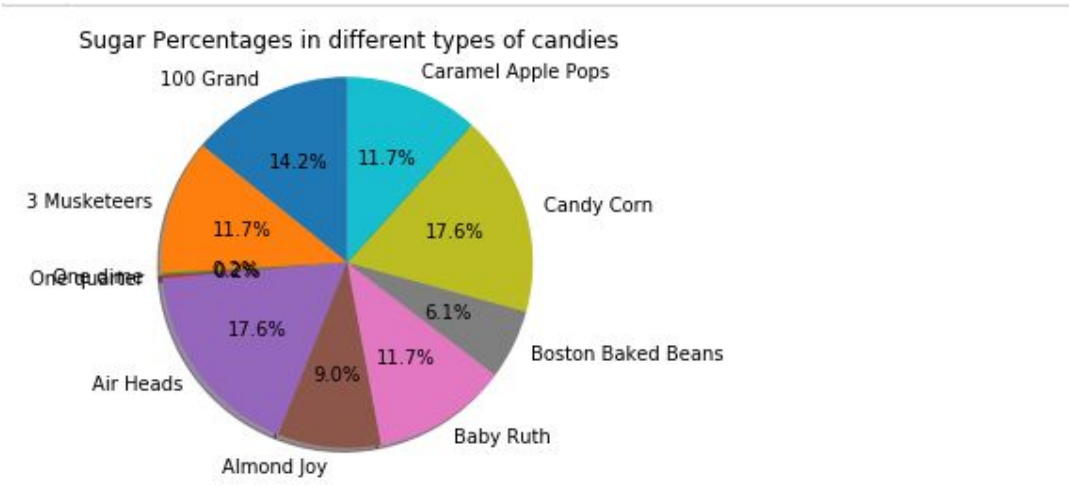
	year	month	date_of_month	day_of_week	births
4019	2011	1	2	7	6540
4439	2012	2	26	7	6707
4453	2012	3	11	7	6497
4481	2012	4	8	7	6545
4873	2013	5	5	7	6609
3816	2010	6	13	7	6963
3837	2010	7	4	7	7279
3879	2010	8	15	7	7352
4264	2011	9	4	7	7399
4320	2011	10	30	7	6870
3617	2009	11	26	4	6864
4376	2011	12	25	7	5728

Max Birth Trends Per Month

	year	month	date_of_month	day_of_week	births
2561	2007	1	5	5	13960
2966	2008	2	14	4	14207
2635	2007	3	20	2	13844
2650	2007	4	4	3	13729
2706	2007	5	30	3	14569
2733	2007	6	26	2	14395
2378	2006	7	6	4	15007
3142	2008	8	8	5	15374
3539	2009	9	9	3	16081
2467	2006	10	3	2	14550
2516	2006	11	21	2	14835
3286	2008	12	30	2	15645

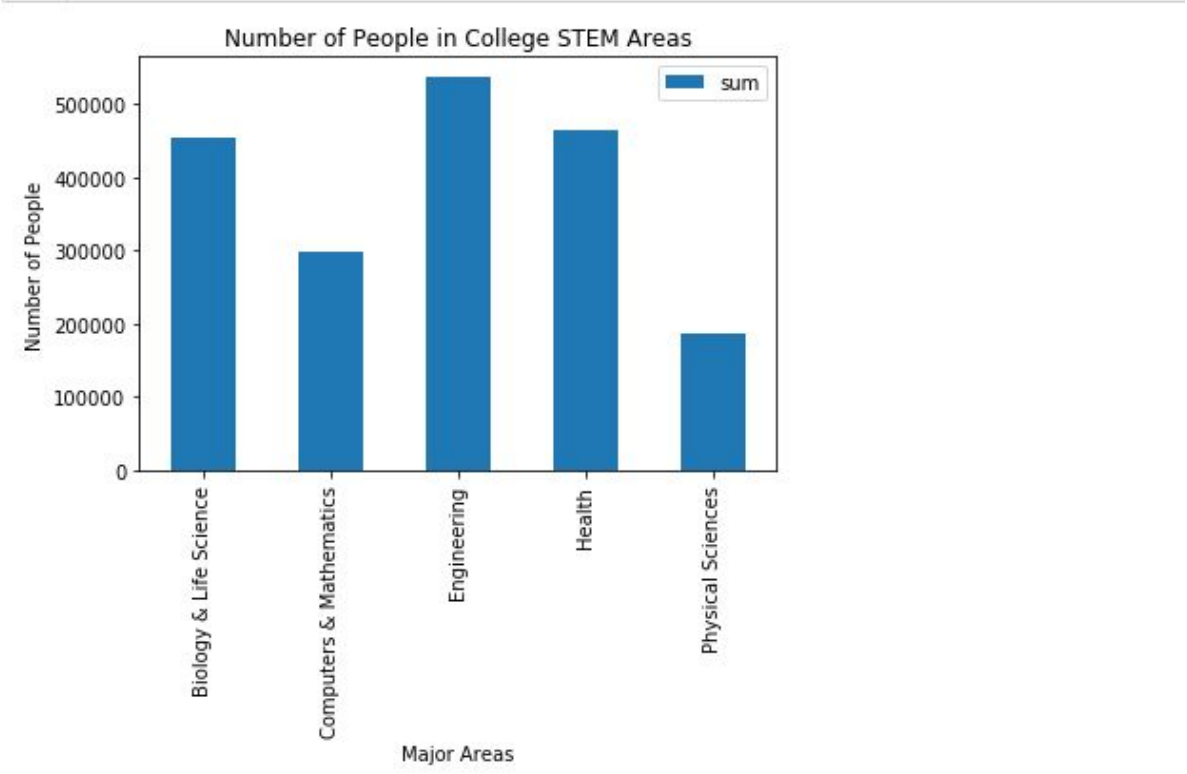
An interesting trend I found was that the day of the week for the majority of min births was Sunday whereas Tuesdays had the most births.

4) **Candy Data:** I used a pie chart for this visualization because the data was recorded as percentages. I was surprised that Air Heads and Candy Corn had similar amounts of sugar.



Film Review Data: I did a star chart of the different types of reviews for a small number of Hollywood films. I was surprised how similar the Fandango scores were and Metacritic which leaves me wondering if those sites have many high reviews in general across many movies.

College Majors Data: I created a bar chart of the different college STEM majors popularity. It was surprising to see computer science and mathematics less popular than biology and engineering since programming and computer science are really popular today.



Part 3: The Value of Visualization Paper

1) The importance of assessing visualization is to help make good choices and to gain some new knowledge about a particular area of interest. The value of visualization is measured based on effectiveness and efficiency.
2) A mathematical model that could be used to describe Figure 1, is the equation I(t) = V(D, S, t). In this equation, the data is transformed to a specification S for a time varying image image I(t). The image perceived by the user can be modeled by the equation dk/dt = P(I, K) where an increase in knowledge K depends on the image, current knowledge of the user and properties of the perception and cognition P of the user.
3) Four Costs: Initial development cost, Initial cost per user, Initial cost per session, Perception and exploration costs.
4) Interaction is considered bad because it allows the user to modify the specification which leads to subjectiveness. In addition it allows for the potential of tuning the visual mapping to produce a desired outcome which can be misleading. Another negative about interaction is that it is costly for the user experience in that giving too many controls to manipulate the visualization can take a significant amount of time. The positive side of interaction is that it allows for analysis of data that may be

too big to visualize on a single screen or too large to be understood from a single image. Interaction also helps create innovative visualization methods so that every aspect of a dataset can be explored which can be simplified with iteration.

Part 4: 3D Scalar Volume Datasets (CS 6635)