Introduction
This project deals with visualizing the progression of women in education through the last forty years. It does this by contrasting the changes between several majors over time. It also works to show the lifetime trend of a woman seeking a high level of degree in a particular subject.

Why You Should Care
Scientists, engineers, educators, and women are the primary focus of this data, but really it is relevant to most everyone who is/has been part of the university system since the inverse of the data essentially models the percentage of men per subject.

The data helps to answer key questions about the gender disparity in several subjects now and in the past.

Description of the Data
Degree Type - Ordinal (BS, Masters, PhD)
Major - Nominal (Health, Education, Math, etc...)
Percentage of Women - Quantitative (0%-100%)

Questions about the Data
• Does there exist a gender disparity in education?
• How does this disparity manifest itself?
• When is this difference most extreme?
• What subjects are the most balanced/unbalanced?
• How/does this trend continue between education levels?
• What subjects have changed the most over time?
• How has the gender disparity changed overall during the last 40 years?

Encoding Data for Visualization
Position (y) will encode the percent of women in a major. Position is typically ranked as the best way to encode quantitative data. So it will be used to encode the most important data in the project. This will have a range of 0%-100% to retain graphical integrity.

Position (x) will be used to encode time passage. This was a more difficult decision to make since there are many good ways to encode time. One way in particular that I considered was varying time with an animation (where a slider would be used to select a particular year.) The problem with this and many other visualizations was that they didn’t show the overall trends of each degree type very clearly. The exception were scatter plots and bar charts which allowed less data before becoming confusing than a simple smooth line chart when taken over 40 years.

Color will be used to distinguish between majors. Color is typically the best way to encode categorical data. So using it to encode majors seems like a natural choice as long as I don’t show more than 7-10+ majors.

Containment will be used to separate the degree types. The secondary goal of this project was to show the trend in female education over the lifespan of an individual. Because of this arranging the degrees by bachelors-masters-doctorate from left to right follows a natural way to view them as passing through a lifetime. Also actually separating them keeps the visualization from having too much going on in a single chart.

Included Interactions
There are basically two things that someone looking at this data would want to do. First they would want to look at the trends of some number of specific majors. I will solve this by allowing the user to toggle any major on/off.

Second they would want to know approximate values for the percentage of women in a given year. This can be solved by possibly including some mouse hovering interaction over the graphs or alternately including a grid you can toggle on/off.

Aesthetic Design
For a while I was debating trying to use a stacked line chart, but it makes comparing majors confusing, and the overall trend can be simulated by a ‘total’ major.

The difference between the final design and the second to last design was removing some axis marks. Since they are the same axis each time, removing them keeps clarity but reduces data ink.

Filling in the area beneath each line makes it more clear that we are looking at the area beneath the graph for women (men is above.) Because of this decision my choices for the colors relating to each major corresponds to how high they typically start out in percentage of women in that subject, where higher corresponds to lighter colors. This way the bottom colors aren’t washed out. Also I used black for the total percentage of women graduating with degrees was because in the classic sense black is like the union of all colors and stands out compared to other colors.

References