

# CSCE 120: Learning To Code

## Organizing Data I Hacktivity 12.2

### Introduction

Prior to engaging in this hacktivity, you should have completed all of the pre-class activities as outlined in this module. At the start of class, you will be randomly assigned a partner to work with on the entirety of this hacktivity as a *peer programming* activity. Your instructor will inform you of your partner for this class.

One of you will be the driver and the other will take on the navigator role. Recall that a driver is in charge of the keyboard and computer while the navigator is in charge of the handout and directing the activity. However, you are *both* responsible for contributing and discussing solutions. If you were a driver/navigator in the prior activity, switch roles for this activity.

## 1 Visualizing Data – Examples

Download the code we've provided from GitHub using the URL, <https://github.com/cbourke/DataVisualization>. Open the project in Light Table.

D3js (Data Driven Documents in JavaScript, <http://d3js.org/>) is a JavaScript library that allows you to construct high-quality, interactive Scalable Vector Graphics (SVG). It is widely used in many “infographics” and other data-driven applications and websites.

We've provided working several examples in the `Demos` folder. Open and examine them with your partner:

- `mlbData.html` – This represents head-to-head wins among baseball teams in the National League Central division in 2014.
- `dfwRates.html` – This data represents DFW-rates of various CS1 courses with particular instructors.

- `CSCE101.html` – This is a bar graph that represents the majors of students in CSCE 101
- `unlDirVer01.html` – This data represents the college/department/faculty organization structure of UNL, there are two variations as well.
- `phoneswitch.html` – This is a professionally created infographic that details how consumers are switching cellular phone providers in the Netherlands.

As a group, discuss the good and maybe bad things about each of these data visualizations. What are some clear patterns that you can discern in each of these visualizations?

## 2 Visualizing Data

In this exercise, you will adapt a D3js example to visualize a set of data. The D3js library itself is very complex and we have not covered it in any detail. Instead, you will be using the example provided and *reverse engineer* it to adapt it to new data. That is, you will identify each part of the example responsible for rendering the data and make appropriate changes.

**Department of Computer Science & Engineering**

**Major Enrollments & Gender**

This page provides some data on the enrollment figures for the last 10 years for both Computer Science and Computer Engineering. In addition, we have tracked the percentage of women in each major.

Data is based on numbers reported by the office of [Insitutional Research & Planning \(IRP\)](#) which is publicly available [here](#).

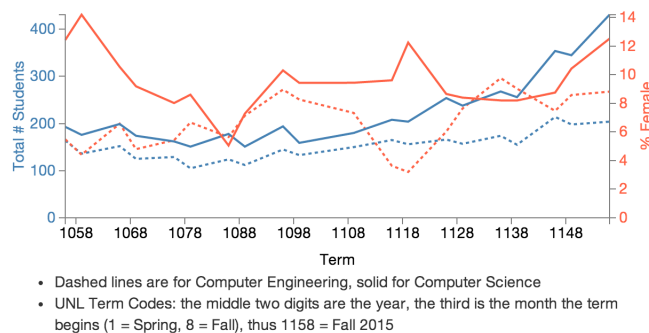


Figure 1: Graph of Enrollment Data

- Take a look at the example provided in `CSCEEnrollment/Original`, especially the JavaScript code. This is a standard line graph plot but with two plots, each on a different scale (thus, there are two y-axes and the plots are color-coded).
- We have provided a page, `CSCEEnrollment/index.html` as well as some data, `enrollments.csv` in CSV format. Using the original as a starting point, plot the data in the CSV file. The data itself represents the number of Computer Science and Computer Engineering majors per term broken down by gender.
- You will make 4 plots: a *total* number of students in each of the two majors (the left y-axis scale) and a *percentage* (on the scale  $[0, 100]$ ) of women in each major (the right y-axis scale) with respect to each term (x-axis).
- Hint: start out by simply graphing some of the raw data to get it working, then make incremental changes until you have something that looks like Figure 1.