Goals: Welcome to CMPS165! The main goal of this course is to learn how to create interactive visualization on the web using D3 (d3js.org)

In order to use D3 effectively, we will learn a variety of web tools including web inspection tools (brackets), HTML, CSS, SVG, and JAVASCRIPT. We will learn and use the following data formats – csv and json. Focus will be on understanding the fundamentals behind binding data to visuals. Examples will include creating a variety of infographics such as bar charts, scatter plots, radial maps, interactive motion charts (similar to ones created by Hans Rosling using his famous software Gapminder) and geomapping.

Several inspiring examples of data visualizations drawn from social sciences, public policy, and data journalism will be presented. Detailed attention will be provided to data scaling, axes, labeling, color, annotations, and legends to create visualizations that set them apart from mediocre visualizations.

I expect that you will be empowered to create compelling data visualizations on the web, a rare and unique skill. These skills are in high demand. I hope that you will use these skills for the benefit of the society. You could also use these skills to find a coveted job.

Textbook:
Interactive Data Visualization for the Web by Scott Murray
(a pdf version of the book is available for free online at the following website:
http://chimera.labs.oreilly.com/books/1230000000345/

Additional Websites:
Brackets.io; w3schools.com; developer.mozilla.org

Catalog Description: Basics of open source programming tools to perform data analysis and create interactive visualizations and maps for the web; data integrity and scraping, statistical computation, simple and novel visualization, geomapping, examples drawn from social sciences, public policy, and data journalism.

Prerequisites: CMPS 12B or equivalent. Most of all, I expect excellent team work (working in a collaborative classroom environment), excellent motivation, and excellent effort. Prior knowledge of HTML, CSS, SVG or Javascript is not required.

Class Presence: Class presence is expected and required with an attendance record of 90% or above, that is, 17 classes or more (out of 19). I will use a teaching style where at least half of the classroom time will be used as a hands-on lab where we will be working together to complete tasks that will build successively upon each other. Please bring your laptops to each class. Class presence is required of all students during the final exam period (June xx, yyday, zzpm) during which final group project will be presented.
If you are left behind, at any stage, then it may require substantial resources to catch up. If you have to miss one or two classes, please identify a student in class who can fill you in so that you can catch up quickly.

Since no previous prerequisite on web technology is required, I will go slowly over the basic concepts of web technology – HTML, CSS, DOM, SVG, javascript. It is possible that some of you are already familiar with these technologies. Extra credit will be provided to students who help others. If you finish the tasks assigned in the class early, I expect you to assist at least two students to complete their tasks. With this binary help, a class of 32 can learn the tasks in just 5 iterations. It is my expectation that the class will work together as a team in learning the material.

I hope that at the end of this journey, you will enjoy breath-taking beauty of interactive web visualization. Stellar examples of interactive web visualizations created by practitioners will be presented in the class.

**Capstone**: This class meets the requirement of a capstone course.

**Evaluations**: Each class will require completion of certain micro-tasks. Examples include successfully installing software such as brackets, D3, preparing data files, making simple html, css, javascript codes, and simple interactive visualizations. These tasks will be designed so that you will be able to complete them in the classroom and “graded” as completed in the classroom. If you miss the class, then you are expected to complete the tasks at your earliest convenience and demonstrate the completion of the task to the instructor in his office hours prior to the next class or to the TA/tutor at designated times. In summary, both completion of the tasks and keeping up with the pace is critical for success. In addition, there may be some written homework. These tasks, all together, constitute 30 points.

In addition, there will be 2 or 3 programming assignments worth 20 points. Finally, there will be a final group project on creating an interactive web visualization. The final project will be evaluated out of 50 points and must be presented in person during the final examination period.

In addition, there may be opportunities to earn 10-20 bonus (or extra credit) points. These points can be earned by good citizenship that includes helping other students, putting in extra effort, classroom participation, bringing new style of interesting visualizations to the attention of the instructor, developing additional curricular materials, and helping instructor improve the learning-teaching environment etc.

Students taking the class on a P/NP basis or severely lagging in timely completion of classroom activities or programming assignments will be required to take a final examination consisting of both theory and practice during the last week of class on March 10 and 12.

Grades as follows: C: >= 60; C+/B-/B: >=65, 70, 75; B+/A-/A: >=85, 90, 95; A+ >100

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