# Week 2: Visualization of Numerical Data

## Overview

During this week's module, you will learn how to appropriately select chart time and assign data to chart elements, all while learning how to visualize data in the most effective way possible. You'll also learn how to plot data variables using higher dimensional visualization methods, and apply principles of design and color to make your visualizations compelling, engaging, and effective.

## Time

This module should take **approximately 4-5 hours** of dedicated time to complete, with its videos and assignments.

## Activities

The activities for this module are listed below (with assignments in **bold**):

| Activity | Estimated Time Required |
|---|---|
| Week 2 Video Lectures | 2 hours |
| **Programming Assignment 1** submission | 2-3 hours |

## Goals and Objectives

Upon successful completion of this module, you will be able to:

- Select an appropriate chart time and assign data to appropriate chart elements to visualize data effectively.
- Understand basic charts and how their elements imply certain characteristics of the data they display.
- Plot more data variables using higher dimensional visualization methods including glyphs, parallel coordinates, and streamgraphs.
- Apply principles of design and color to make a data visualization more compelling, engaging, and effective.

## Guiding Questions

Develop your answers to the following guiding questions while completing the readings and working on assignments throughout the week.

- How can I apply these techniques to the data I encounter in my own work?

## Additional Readings and Resources

**Design:**

[The Visual Display of Quantitative Information](#) by Edward Tufte

[Envisioning Information](#) by Edward Tufte

[Visual Explanations: Images and Quantities, Evidence and Narrative](#) by Edward Tufte

**Color:**

[Information Visualization: Perception for Design](#) by Colin Ware

# Key Phrases and Concepts

Keep your eyes open for the following key terms or phrases as you complete the readings and interact with the lectures. These topics will help you better understand the content in this module.

- Data variables: nominal, ordinal, and quantitative; discrete v. continuous; dependent v. independent
- The perceptual accuracy of how different chart elements represent data variables
- How glyphs represent multiple dimensions of individual data items, how parallel coordinates plot data over many dimensions, and how streamgraphs improve on stacked bar charts
- Chartjunk, the data-ink ratio, and other design rules
- Hue, saturation, value, and other ways of thinking about color

# Tips for Success

To do well this week, I recommend that you do the following:

- Review the video lectures a number of times to gain a solid understanding of the key questions and concepts introduced this week.
- When possible, provide tips and suggestions to your peers in this class. As a learning community, we can help each other learn and grow. One way of doing this is by helping to address the questions that your peers pose. By engaging with each other, we'll all learn better.
- It's always a good idea to refer to the video lectures and chapter readings we've read during this week and reference them in your responses. When appropriate, critique the information presented.
- Take notes while you read the materials and watch the lectures for this week. By taking notes, you are interacting with the material and will find that it is easier to remember and to understand. With your notes, you'll also find that it's easier to complete your assignments. So, go ahead, do yourself a favor; take some notes!

# Getting and Giving Help

You can get/give help via the following means:

- Use the **Learner Help Center** to find information regarding specific technical problems. For example, technical problems would include error messages, difficulty submitting assignments, or problems with video playback. If you cannot find an answer in the documentation, you can also report your problem to the Coursera staff by clicking on the **Contact Us!** link available on each topic's page within the Learner Help Center.

- Use the **Content Issues** forum to report errors in lecture video content, assignment questions and answers, assignment grading, text and links on course pages, or the content of other course materials. University of Illinois staff and community TAs will monitor this forum and respond to issues