Introduction to Data Science

Welcome!

Today we are going to get all of the administrative details. Here is a quick outline:

- – give a brief overview of the course material
- – go through the syllabus
- – tell you a bit about myself
- – install software
- – answer any additional questions

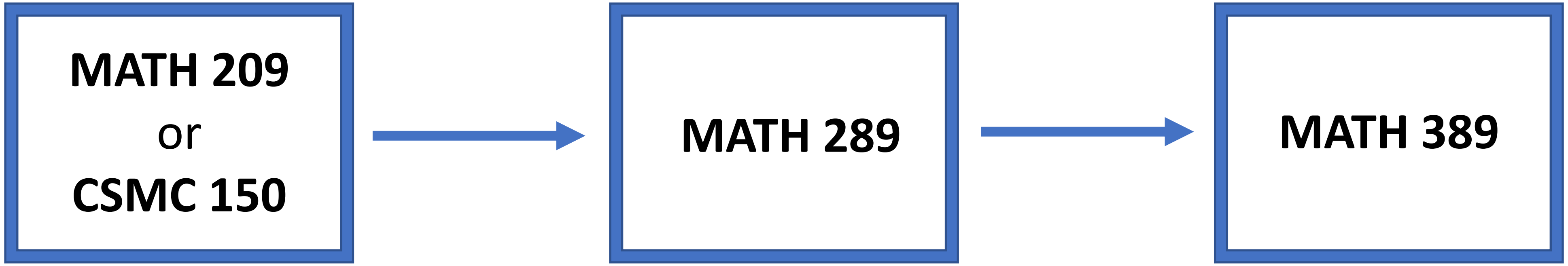
Data Science

What exactly is data science?

Data science is an interdisciplinary field concerned with drawing knowledge from data and communicating those results to various audiences. Data science needs to be learned *by doing* data science.

By the end of the semester, you will feel confident collecting and analyzing datasets from a variety of fields. You will be able to use these skills to address data-driven problems in a wide range of application domains.

Course Sequence



MATH 209
or
CSMC 150

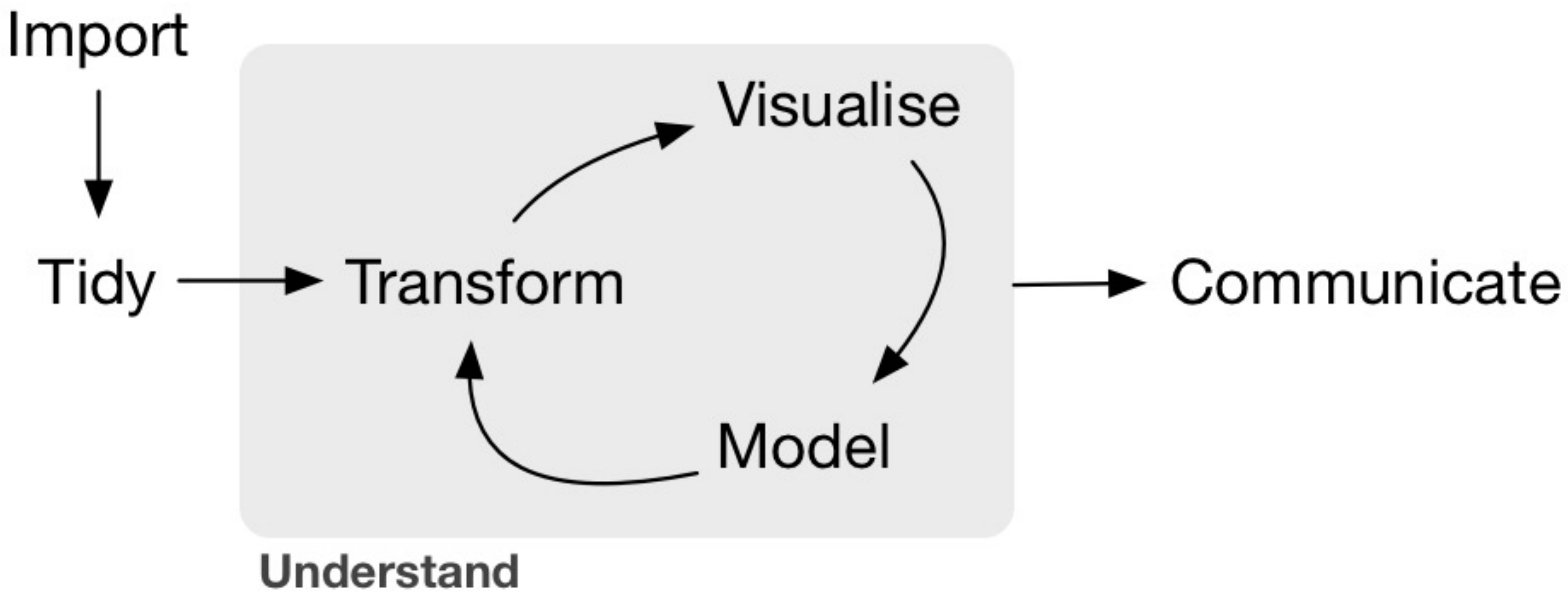
MATH 289

MATH 389

This course assumes you have some experience using code to manipulate data. It makes no assumptions about your knowledge of any specific programing language or knowledge of statistical inference.

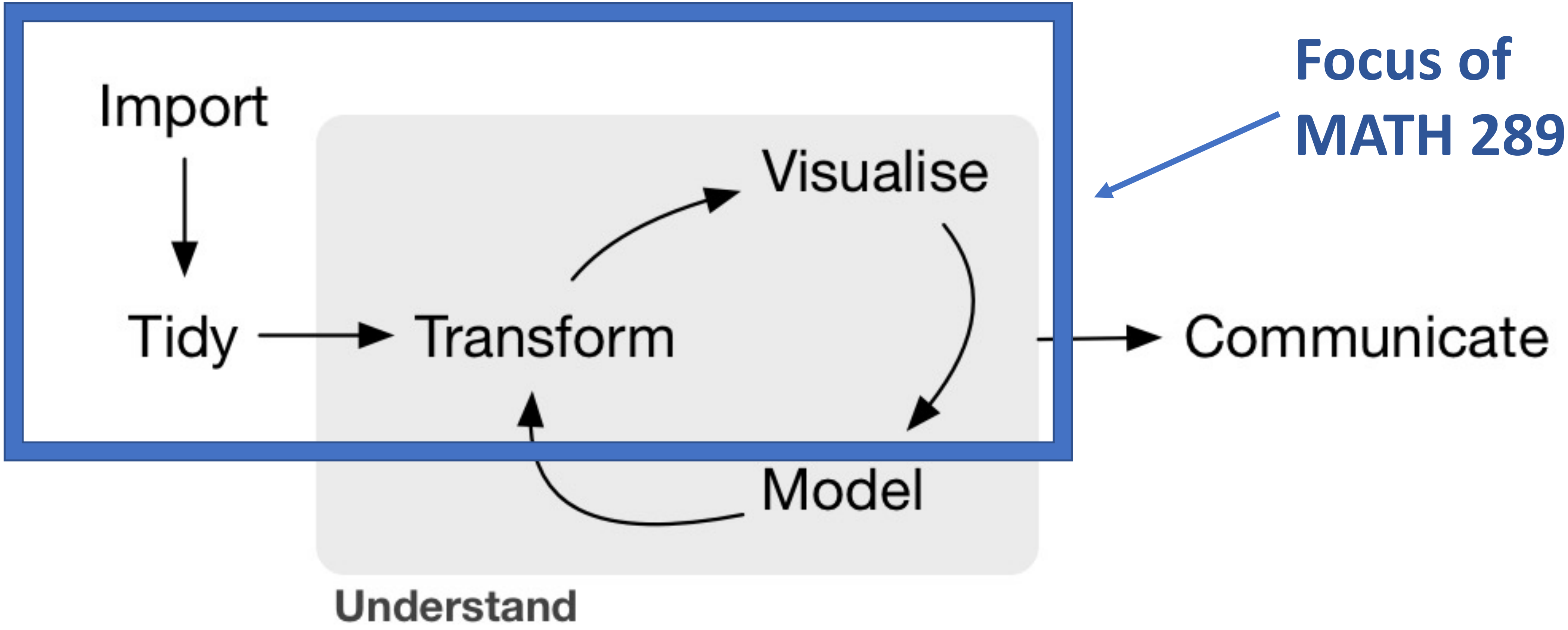
The class is designed as a year-long sequence paired with MATH 389; I strongly suggest taking both during the same academic year if possible.

Data Science Pipeline



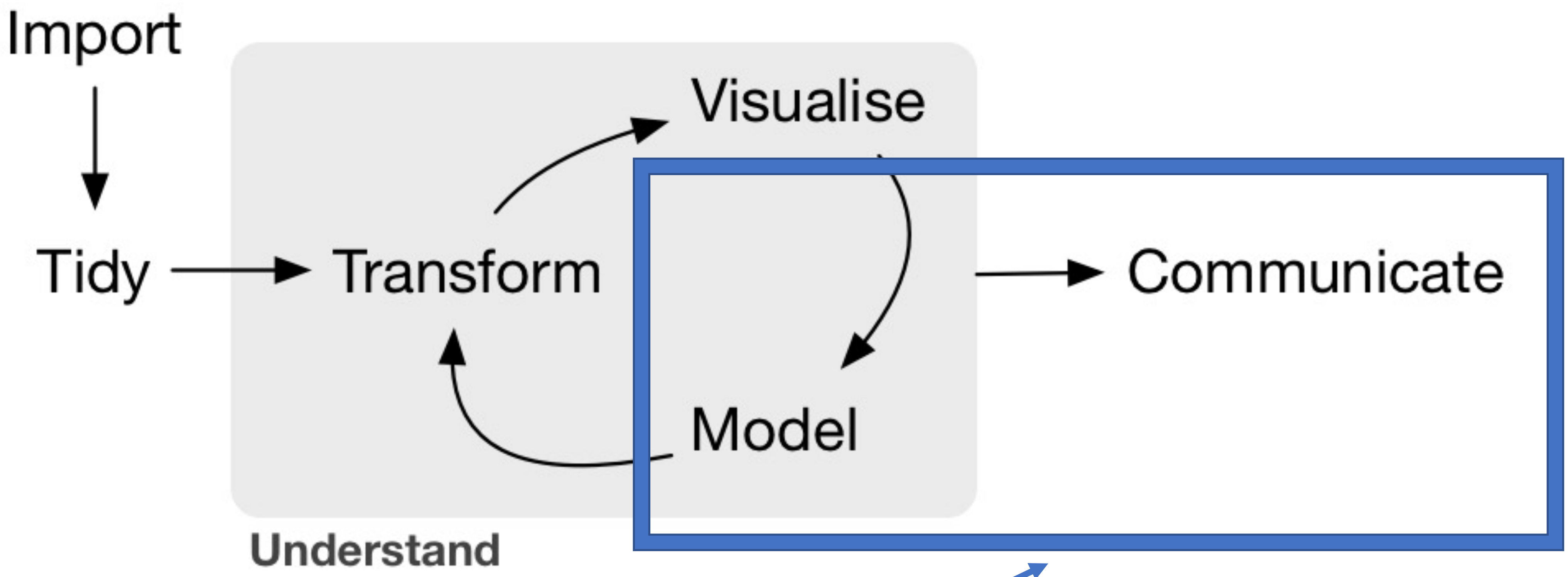
Grolemund & Wickham R4DS Illustration

Data Science Pipeline



Grolemund & Wickham R4DS Illustration

Data Science Pipeline



Grolemund & Wickham R4DS Illustration

Focus of MATH 389

Programming

There are several different programming languages for data science. By far the two most popular are R and Python.

We will be using R this semester but will learn a version that is easily adapted to other languages such as Python.

In the last week I will demo the use of Python and JavaScript based on the the class material.

Course Topics

I like to think of this course are organized around several different *languages* of data science. These are more formal ways of thinking about how to work with different parts of the DS pipeline.

The languages we will focus on this semester are:

— the grammar of graphics
— relational algebra
— functional programming
— APIs
— regular expressions
— XPath expressions
— geographic information systems (GIS)

Class Structure

Most course meetings are organized as follows:

— **notes:** introduction to a new topic (usually, < 15 minutes)
— **classwork**: answer questions in the form of an R notebooks
— **homework**: finish left-over classwork and any posted readings

All materials can be found on the course website.

Syllabus

See syllabus posted on the course website.

About Me

- From New England: born in Maine, school in MA, ME, CT
- Moved to Richmond in 2016
- Research on large text and image datasets in linguistics and cultural studies

Photogrammar

R Journal

ACLS

Distant Viewing Lab

THE ANDREW W. MELLON FOUNDATION

NATIONAL ENDOWMENT FOR THE HUMANITIES

COLLEGIUM DE LYON
Université de Lyon

About Me

- Lots of industry experience in DS:
  - IBM (Healthcare)
  - Travelers (Insurance)
  - DARPA (social media)
  - AT&T (location analytics)
  - Telperian (pharmaceuticals)
- Own two Shih-Tzus, Sargent and Roux

About Me

- I have two Shih-Tzus: Roux and Sargent
- Roux is often in my office; please come say hello