

Software Tools for Business Analytics

January 23-24 and 26-27, 1-4 pm in E62-250

Because of the "big data revolution," there is an ever-increasing need for techniques for analyzing data, developing mathematical models, and using these models to make informed decisions. To get started in this process, one needs a working knowledge of business analytic software tools.

These four non-credit workshops focus on software tools used in Course 15 classes. The goal of these workshops is to provide students with a baseline knowledge of business analytics software tools that they can use in MIT courses, UROPs involving data analysis, and summer internships or jobs after graduation.

Sign up is not required, but there is some pre-work that needs to be done (setting up your computer to use R and access Github). See link below for instructions. [Bring your laptop to each session.](#)

To register: <http://tinyurl.com/hn2uf3d>

Installation instructions and more information: <http://tinyurl.com/zgznpw3>

Questions?: Scott Alessandro, salessan@mit.edu

Session 1 (Terminal and Github) – Monday, January 23, 1-4 pm, E62-250. Instructor: Brad Sturt

Description: In this session we will give an overview to working with the terminal, Github, and an introduction to the R programming language.

Session 2 (Basic Wrangling and Visualization) – Tuesday, January 24, 1-4 pm, E62-250. Instructor: Steven Morse

Description: This session will introduce basic techniques in data wrangling and visualization in R. Specifically, we will cover some basic tools using out-of-the-box R commands, then introduce the powerful framework of the “tidyverse” (both in wrangling and visualizing data), and finally gain some understanding of the philosophy of this framework to set up deeper exploration of our data. Throughout, we will be using a publicly available dataset of AirBnB listings.

Session 3 (Excel) – Thursday, January 26, 1-4 pm, E62-250. Instructor: Charles Thraves

Description: Introduce and practice with concrete real life examples on how to use the most important functions and shortcuts in Excel. The goal is to enable students to face a wide variety of problems in an efficient way in Excel. Students will be given a problem with a series of tasks to accomplish. These tasks will be solved using different Excel functionalities. Most of these problems have been based on real company spreadsheet problems.

Session 4 (JuMP/Julia) – Friday, January 27, 1-4 pm, E51-085. Instructor: Joey Hutchette

Description: This session introduces optimization, where we will learn how to use mathematical models to solve decision problems. Using the Julia programming language and the JuMP package, we will see how we can naturally model and solve optimization problems that arise in a variety of contexts throughout analytics and operations.

(see next page for pre-assignment for setting up computer to use R and access Github)

Before the first class, please complete the following tasks.

Task 1: Make a Github Account

We will be using Github to distribute code.

*Please go to www.github.com and make a free account.

Task 2: Download `R` and RStudio

We will be learning the `R` programming language for statistical computation. To interact with `R`, we will use RStudio to write and execute `R` commands.

*Install `R`: Navigate to <https://cran.cnr.berkeley.edu/> and follow the instructions for your operating system. [If you already had R installed on your computer, make sure it is the latest version of R ($\geq 3.3.1$).

Download RStudio: Navigate to <https://www.rstudio.com/products/rstudio/download/> and download RStudio Desktop with an Open Source License.

Test Your Installation: Open RStudio and type $1+2$ into the Console window, and type "Enter."

Task 3 (Windows Users Only): Download Putty

We will be learning how to interact with computers through a "terminal".

*Windows users should navigate to

<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>, and download the "putty.exe" program found on that page

* Under "Host Name", type athena.dialup.mit.edu, and click "Open"

* When prompted, type in your MIT id username and password.

* Verify you see the text "Welcome to athena.dialup.mit.edu"

(Windows 10 Users Only) Download Compatibility software

* <https://github.com/tuiSSE/win-sshfs>

* Click on the Download link at the bottom of the page

* Download FiSSH_Package.zip

* Open up the zip file, and extract DokanInstaller by right-clicking on the DokanInstaller icon and clicking "Extract"

* Right-click on DokanInstaller, click on Compatability, and set Compatability mode to "Windows 7"

* Double click on DokanInstall_0.6.0 to install it.

* Go through the rest of the instructions

Task 4 (Windows Users Only): Download win-sshfs

Windows users will be utilizing the MIT athena clusters for some of the class material. win-sshfs lets Windows users access files on the MIT athena clusters from their own computers.

*To download, go to <https://code.google.com/p/win-sshfs/downloads/list>, and download the "win-sshfs-0.0.1.5-setup.exe" file. Go through the installation steps.

* After going through the installation steps, verify that you can "mount the athena as a local drive". To do this, click the "+ Add" button.

** Next to "Drive Name: ", type: \langle your mit id \rangle @'athena.dialup.mit.edu'

where \langle your mit id \rangle is replaced by your MIT log-in id.

** Next to "Host: ", type: athena.dialup.mit.edu

** Next to "Port: ", leave the default number.

** Next to "Username: ", type: \langle your mit id \rangle

** Next to "Authentication method", select "Password"

** Next to "Password", type your MIT log-in password.

* Click "Save", and then click "Mount". Open Windows Explorer, and verify that there is a new folder called \langle your mit id \rangle @'athena.dialup.mit.edu'. Click on it, and there will be some folders in it.