Installing the software needed

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Contents

1 Installing MATLAB

MathWorks is providing you access to MATLAB for use in your coursework. When planning your activity, please note that access is valid for the length of the course (12 weeks).

1. Enter your email to create a MathWorks account if you do not have one. https://www.mathworks.com/downloads/web_downloads/
2. Use this **link** again to download and install. You may need to log-in to your MathWorks account that you created in Step 1. After starting the installer, accept all defaults and log-in to your MathWorks account when prompted.

Note: If you can not download it, let me know and I can help you.

For additional resources, including an introduction to the MATLAB interface, please see "More Octave/MATLAB Resources."

2 Installing Octave (GUI)

2.1 Installing Octave on Windows

Use this link to install Octave for windows: https://www.gnu.org/software/octave/ and http://wiki.octave.org/Octave_for_Microsoft_Windows

Octave on Windows can be used to submit programming assignments in this course but will likely need a patch provided in the discussion forum. Refer to https://www.gnu.org/software/octave/ for more information about the patch for your version.

"Warning: Do not install Octave 4.0.0"; checkout the "Resources" menu's section of "Installation Issues".

2.2 Installing Octave on GNU/Linux

We recommend **using your system package manager to install Octave**.

On Ubuntu, you can use: - `sudo apt-get update && sudo apt-get install octave`

On Fedora, you can use: - `sudo yum install octave-forge`

Please consult **the Octave maintainer's instructions** for other GNU/Linux systems.

"Warning: Do not install Octave 4.0.0"; checkout the "Resources" menu's section of "Installation Issues".

2.3 Installing Octave on Mac OS X (10.10 Yosemite and 10.9 Mavericks)

1. Mac OS X **has a feature called Gatekeeper** has a feature called Gatekeeper that may only let you install applications from the Mac App Store. You may need to configure it to allow the Octave installer. Visit your System Preferences, click Security & Privacy, and check the setting to allow apps downloaded from Anywhere. You may need to enter your password to unlock the settings page.

2. Download **the Octave 3.8.0 installer** or the latest version that isn't 4.0.0. The file is large so this may take some time.

3. Open the downloaded image, probably named GNU_Octave_3.8.0-6.dmg on your computer, and then open Octave-3.8.0-6.mpkg inside.

4. Follow the installer's instructions. You may need to enter the administrator password for your computer.

5. After the installer completes, Octave should be installed on your computer. You can find Octave-cli in your Mac's Applications, which is a text interface for Octave that you can use to complete Machine Learning's programming assignments.

Octave also includes an experimental graphical interface which is called Octave-gui, also in your Mac's Applications, but we recommend using Octave-cli because it's more stable.

Note: If you use a package manager (like MacPorts or Homebrew), we recommend you follow **the package manager installation instructions**.

"Warning: Do not install Octave 4.0.0"; checkout the "Resources" menu's section of "Installation Issues".

2.4 Installing Octave on Mac OS X (10.8 Mountain Lion and Earlier)

Installing Octave on Mac OS X (10.8 Mountain Lion and Earlier) If you use Mac OS X 10.9, we recommend following the instructions **Section ??**. For other Mac OS X versions, the Octave project doesn't distribute installers. We recommend installing Homebrew, a package manager, using **their instructions**.

"Warning: Do not install Octave 4.0.0"; checkout the "Resources" menu's section of "Installation Issues".

3 Installing Python 3

I recommend to install **Anaconda**. If you do need to install Python and aren't confident about the task you can find a few notes on the **BeginnersGuide/Download wiki** page, but installation is unremarkable on most platforms.

4 Tutorials for Matlab

At the MATLAB command line, typing help followed by a function name displays documentation for a built-in function. For example, help plot will bring up help information for plotting. Further documentation can be found at the MATLAB **documentation pages**.

4.1 Introduction to MATLAB

MathWorks also has a series of videos about various MATLAB features:

Learning Module	Learning Goals
What is MATLAB?	Introduce MATLAB
The MATLAB Environment	Navigate the command line, workspace, directory, and editor
MATLAB Variables	Use the assignment operator to define scalar variables
MATLAB as a Calculator	Perform arithmetic calculations with scalars and functions using MATLAB syntax and order of operations.

Learning Module	Learning Goals
Mathematical Functions	Use MATLAB variables for input and output to functions. Examples include: COS, SIN, EXP, and NTHROOT.

4.2 Vectors

Learning Module	Learning Goals
Creating Vectors via Concatenation	Create vectors by entering individual elements
Accessing Elements of a Vector	Access specific elements of a vector
Vector Arithmetic	Perform arithmetic calculations with vectors including element-wise operations
Vector Transpose	Use the transpose operator to convert between row and column vectors
Creating Uniformly Spaced Vectors (The Colon Operator)	Use the colon operator syntax to create vectors given the starting and ending values and the size of the interval
Creating Uniformly Spaced Vectors (The LINSPACE Function)	Use the LINSPACE function to create a vector.

4.3 Visualization

** Learning Module **	Learning Goals
Line Plots	Create a line plot of a vector and customize plot markers and colors
Annotating Graphs	Label axes, add a title, and add a legend to a plot

4.4 Matrices and Arrays

Learning Module	Learning Goals
Creating Matrices	Create matrices by directly entering scalars
Array Creation Functions	Create larger matrices and vectors with built in MATLAB functions such as ZEROS and EYE
Accessing Elements of an Array	Access elements of an array including entire columns or rows using row-column indexing.
Array Size and Length	Use built-in functions to determine array dimensions
Concatenating Arrays	Build larger arrays from smaller ones
Matrix Multiplication	Perform matrix multiplication and interpret error messages related to incompatible dimensions.

4.5 Programming

Learning Module	Learning Goals
Using the MATLAB Editor	Write a script in the MATLAB Editor, break code into sections to execute, and find help on functions
Logical Operators	Use relational and logical operators to create logical variables for program control
Conditional Data Selection	Access and change elements for a vector the meet a specified criteria
If-Else Statements	Use if-else statements to control which lines of code are evaluated
For Loops	Repeat a sequence of commands a specified number of times
While Loops	Repeat a sequence of commands while a specified condition is true

4.6 Learn to Code in Matlab

https://learntocode.mathworks.com/portal.html

This is a very interactive course with videos, exercises, made by the creators of Matlab. This will help you with the fundamentals and steps by step process for most of what is needed for the course. It is written for a wide audience so the steps are extremely clear, with simple language and each lesson have a video with exercises. You do not need an account to take the tutorial.

Other sets of videos targetting machine learning building blocks are described below.

5 Tutorials for Octave

At the Octave command line, typing `help` followed by a function name displays documentation for a built-in function. For example, `help plot` will bring up help information for plotting. Further documentation can be found at the Octave **documentation pages**.

6 Tutorials for Python

At the Python console, typing help([object]) invokes the built-in help system. If no argument is given, the interactive help system starts on the interpreter console. If the argument is a string, then the string is looked up as the name of a module, function, class, method, keyword, or documentation topic, and a help page is printed on the console. If the argument is any other kind of object, a help page on the object is generated. Further documentation can be found at **documentation for python 3.6.4.**.

If you've never programmed before, the tutorials on this **beginners guide** are recommended for you; they don't assume that you have previous experience. When you're learning, small **examples** can be very helpful. If you have programming experience, also check out the **beginnersGuide/programmers** page and the **python module index**.

6.1 Programming in Python

Learning Module	Learning Goals
For loop	Repeat a sequence of commands a specified number of times
While	Repeat a sequence of commands as far as a condition is satisfied
Functions	Use Python variables for input and output to functions.
Strings	Manipulation of characters
List	Sequential collection of Python data values, where each value is identified by an index
Files	How to work with Files

Learning Module	Learning Goals
Dictionaries	Python's built-in mapping type.