

Hello!



- I'm **Chris Blake** and I'm a lecturer in the Centre for Astrophysics & Supercomputing
- Please contact me! You can ...
- E-mail: cblake@swin.edu.au
- Use Canvas inbox/messaging
- Chat to me during tutorials/labs

Introduction to computer labs

- In the weekly computer lab, we'll study the **numerical application** of the maths we're learning
- **Weeks 1-7:** We'll use the **MATLAB language**, which is optimized for matrix applications
- **Weeks 8-12:** We'll use the **R language**, which is optimized for statistical applications
- Over the next few weeks, we'll complete different parts of an assessed **MATLAB Project**

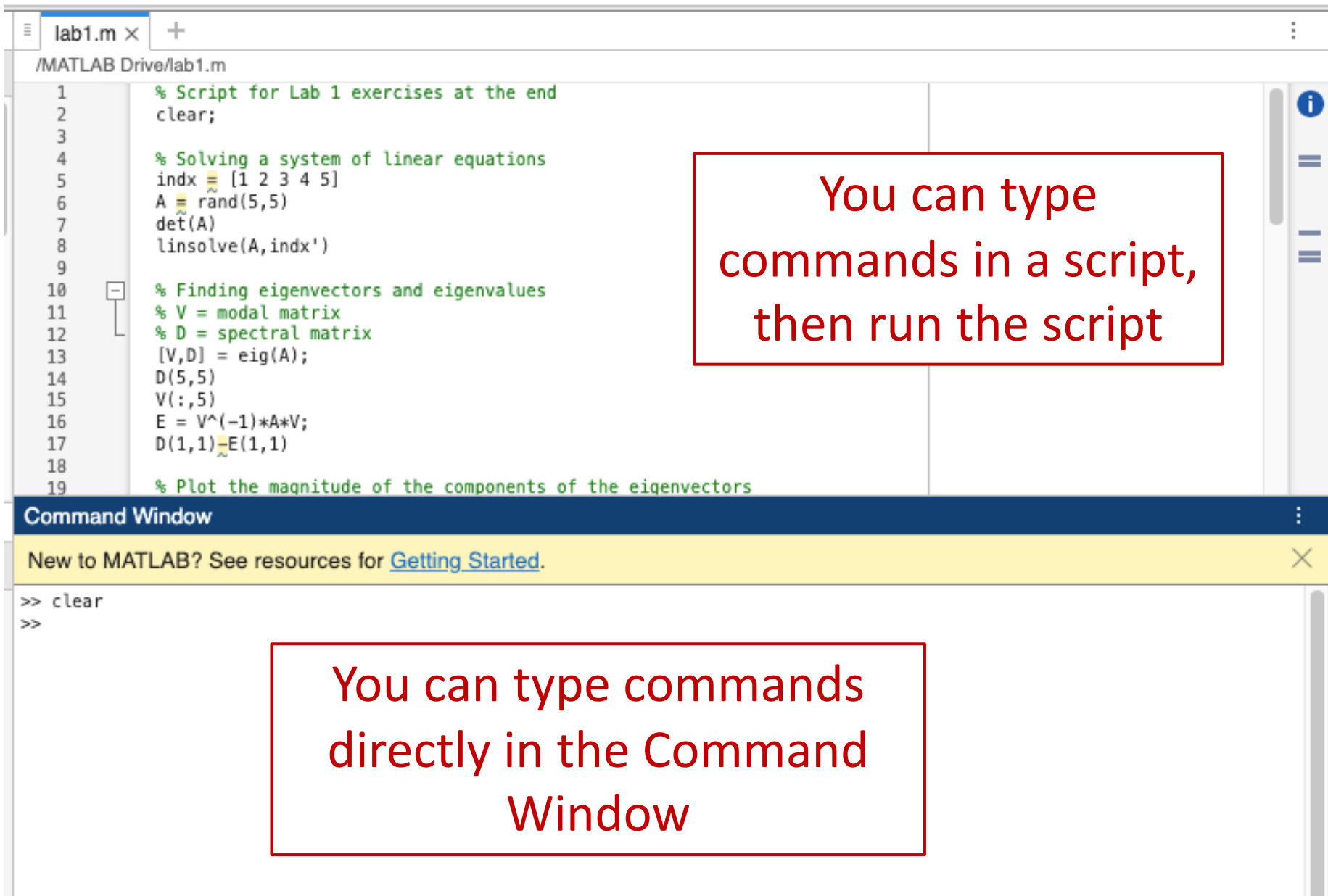
Plan for Week 1 Computer Lab

- If you haven't already done so, create a **MathWorks account** and make sure you can run MATLAB 😊
(see options on next slide)
- Familiarize yourself with basic commands by running through the “**MATLAB Lab 1**” instructions
(If you're already familiar with another computer language, perhaps make a table of matching commands to help you)
- Start the **Onramp Course** on the MathWorks website
(You'll need to complete it by the end of Week 2, as part of your assessed MATLAB Project)

Installing MATLAB

- Create a MathWorks account using your **Swinburne e-mail**
<https://au.mathworks.com/academia/tah-portal/swinburne-university-of-technology-30596663.html>
- Options for running MATLAB:
 1. **Install MATLAB on your laptop** (from MathWorks website)
 2. **Open MATLAB online** (from MathWorks website)
 3. **Run MATLAB on the PC** in front of you
- Support for downloading MATLAB is also available at:
<http://www.its.swinburne.edu.au/services/software.html>
(Software for students → Other software → MATLAB reference guide)

Running MATLAB



The image shows the MATLAB software interface. At the top, a title bar indicates the active file is 'lab1.m'. Below this, the script editor displays a MATLAB script with 19 lines of code. The script includes comments for Lab 1 exercises, clearing the workspace, solving a system of linear equations using `linsolve`, finding eigenvectors and eigenvalues using `eig`, and plotting the magnitude of the components of the eigenvectors. A red-bordered box with text is overlaid on the right side of the script editor. Below the script editor is the Command Window, which currently shows the prompt `>>` and the command `clear`. A yellow banner at the bottom of the Command Window provides a link to 'Getting Started' resources. A second red-bordered box with text is overlaid on the bottom right of the Command Window.

```
1 % Script for Lab 1 exercises at the end
2 clear;
3
4 % Solving a system of linear equations
5 indx = [1 2 3 4 5]
6 A = rand(5,5)
7 det(A)
8 linsolve(A,indx')
9
10 % Finding eigenvectors and eigenvalues
11 % V = modal matrix
12 % D = spectral matrix
13 [V,D] = eig(A);
14 D(5,5)
15 V(:,5)
16 E = V^(-1)*A*V;
17 D(1,1)=E(1,1)
18
19 % Plot the magnitude of the components of the eigenvectors
```

You can type commands in a script, then run the script

Command Window

New to MATLAB? See resources for [Getting Started](#).

```
>> clear
>>
```

You can type commands directly in the Command Window

Lab 1 instructions

▼ Week 1



MATLAB resources



Study plan for Week 1 (August 4 -August 10)



Tutorial 1



MATLAB Laboratory 1



lecture notes from study guide

MATLAB Onramp

- Can access from the MathWorks website:

The screenshot shows the MATLAB Onramp page on the MathWorks website. The page has a dark blue header with the MATLAB logo on the left and a search bar labeled "Search Help Center" on the right. Below the header, there is a "Get Help" sidebar on the left with links to "Documentation", "MATLAB Answers", and "File Exchange". The main content area features two large buttons: "Open MATLAB Online" and "Install MATLAB". Below these is a "Recent" section with a search bar. The "Files" section is highlighted with a red circle, showing three course cards: "MATLAB Onramp Unlimited Access", "Simulink Onramp Unlimited Access", and "Machine Learning Onramp Unlimited Access". Each card has a "Start" button. A "View all courses" link is at the bottom right.

MATLAB Search Help Center CB

Get Help

- Documentation
- MATLAB Answers
- File Exchange

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Plot for Lab 1

