Intro to MATLAB®

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Pre-class Instructions:

MatLab
Download MatLab here, UCSB has a campus license: http://www.software.ucsb.edu/info/matlab

Obtain lesson materials
You will also need to download some data, which we will analyze using MATLAB:
1. Make a new folder on your Desktop called matlab-novice-inflammation.
2. Download matlab-novice-inflammation.zip and move the file to this folder.
3. Extract the zip archive. This will place all the data in the matlab-novice-inflammation directory. Note that on Windows, double-clicking on the zip file simply previews the contents: to extract, right-click and select Extract All
4. Follow session material: https://swcarpentry.github.io/matlab-novice-inflammation/

Post-It Notes

- **<u>Red</u>**: Help needed
- **<u>Green</u>**: Good to go

What is MATLAB?

- MATLAB(matrix laboratory)
- the language of technical computing
- A programming environment for algorithm development, data analysis, visualization, and numeric computation.
- Designed by Cleve Moler at the University of New Mexico, in the late 1970s
- Proprietary language of Mathworks, mathematical computing software company

https://www.mathworks.com/company/aboutus.html
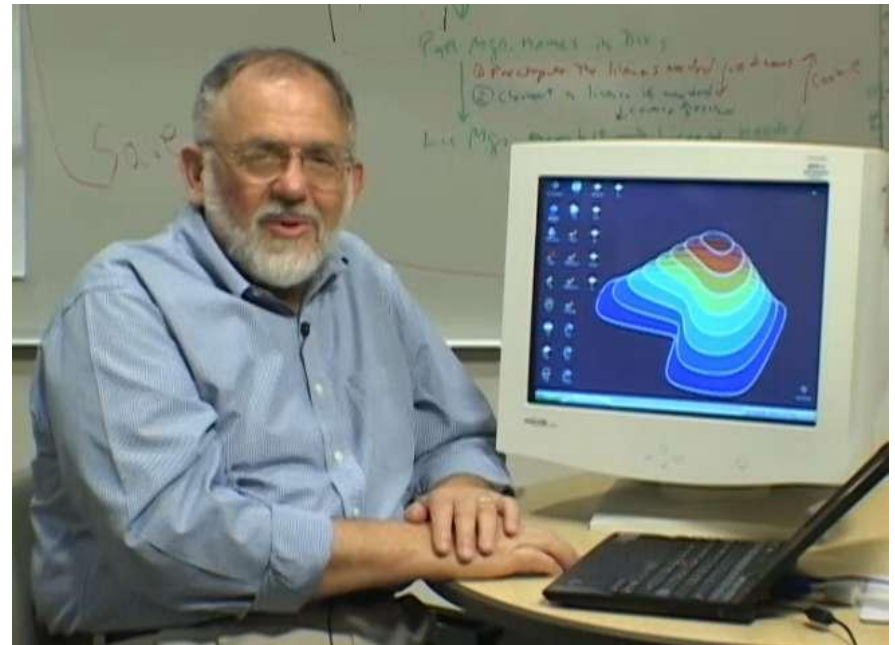
Why Use MATLAB?

- Professionally developed, rigorously tested, fully documented
- Large (and growing) user base among scientists in academia and industry
- Large library of packages available for performing diverse tasks
- Ability to scale, run on clusters, GPUs, and clouds

Post-It Notes

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Data Set

- Data Set, Code and Lesson Material available here:
  http://swcarpentry.github.io/matlab-novice-inflammation/

What is a Script?

- How to run code
- Save yourself work!
- Don't need to type over and over again
- Move easily between machines

Using MATLAB on a Cluster

- Make sure your code runs from start to end on your own machine
- Perform tests on your computer first
- A simple script (text file) can be used to submit to the queue:

```
#!/bin/bash
#SBATCH --nodes=1 --ntasks-per-node=1
#SBATCH --time=1:00:00
#SBATCH --mail-user=user@ucsb.edu
#SBATCH --mail-type=start,end
module load matlab
cd $SLURM_SUBMIT_DIR
matlab -nodisplay -nodesktop -nosplash < matlab_simple.m
```
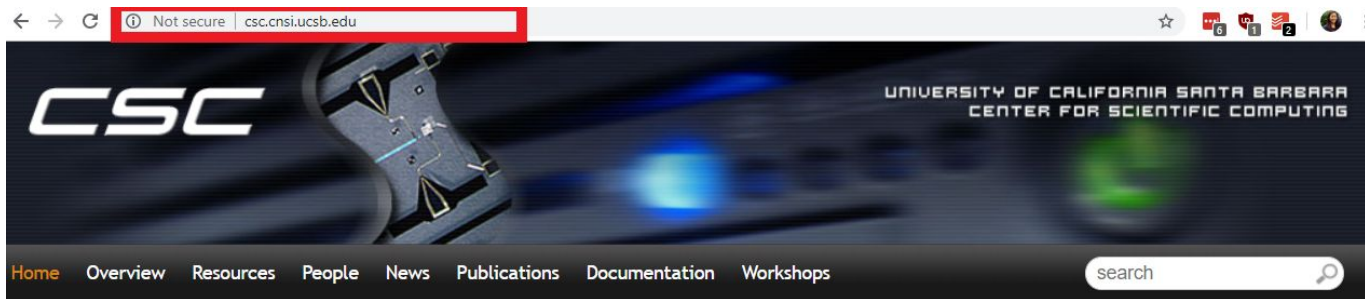
Using MATLAB on the Cluster

```
#!/bin/bash
#SBATCH --nodes=1 --ntasks-per-node=1
#SBATCH --time=1:00:00
#SBATCH --mail-user=user@ucsb.edu
#SBATCH --mail-type=start,end
module load matlab
cd $SLURM_SUBMIT_DIR
matlab -nodisplay -nodesktop -nosplash <
matlab_simple.m
```

- The shell you are using
- Asking for one node and one task per node
- Walltime: 1 hour
- Mail to user
- Mail begin/end
- Launch MATLAB
- Change directory to the one where job is submitted from
- Run your MATLAB matlab_simple.m code, without launching graphic interface and display

How to Request a User Account

How to Learn More

- Online Tutorials:
    - Mathworks
    - YouTube
    - MIT OpenCourseWare: Intro to MATLAB
    - Lynda.com (available to UCSB employees, including student employees)
- One-on-One Consultation
    - Center for Scientific Computing (Elings Hall 3229)
    - Collaboratory
- Books
    - UCSB students, staff and faculty (i.e. anyone with a UCSBNetID, or access to computer on campus), you can get free access to a zillion great Computing related textbooks here http://proquest.safaribooksonline.com/

Post-Workshop Survey

- Be sure to complete the pre-workshop survey below. We use this to calibrate the pace of the workshop and, together with a post-workshop survey, to assess how it went.
- https://ucsbltsc.qualtrics.com/jfe/form/SV_dnefzhevTuDnyZL

Contact Us

Webpage: **csc.cnsi.ucsb.edu**

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