**Hello 3DSlicer!**

Please review the Slicer Programming Tutorial found here: [https://www.dropbox.com/s/wrhrvvmplosiis1/Slicer4\_ProgrammingTutorial\_SPujol-SPieper\_Nightly.pdf?dl=0#](https://www.dropbox.com/s/wrhrvvmplosiis1/Slicer4_ProgrammingTutorial_SPujol-SPieper_Nightly.pdf?dl=0) and use it as a reference to perform the following actions.

**Step 1. Install and Run 3DSlicer**

3DSlicer can be installed from <https://download.slicer.org/>.

**Step 2. Load and Image**

Load the brain.nii.gz image provided on the course website into 3D Slicer. Explore the image in the displayer by displaying it and then using the mouse to scroll, zoom, and pan.

**Step 3. Use the Python Consule**

Open the python consule and use it to print basic information about the image. Identify the origin, spacing, and orientation matrix information.

**Step 4. Create a Python Module**

Create a Module in 3DSlicer called ImageThreshold that

1. Allows the user to select an image from a dropdown menu (GUI element)
2. Allows the user to set and upper and lower threshold (GUI element)
3. Creates a mask volume comprising those pixels within the upper and lower threshold (Logic Element)

**Step 5. Create a Python Module involving SimpleITK**

SimpleITK is an open source package included in 3DSlicer that has already implemented a large variety of image filters (<https://simpleitk.readthedocs.io/en/latest/Documentation/docs/source/filters.html>). Review the list and select one filter. Create a Module in 3DSlicer that will run the given image filter and create a new image node from the output of the filter. How to import and use SimpleITK is found here: <https://www.slicer.org/wiki/Documentation/4.10/ScriptRepository#Running_an_ITK_filter_in_Python_using_SimpleITK>

For ambitious students, try building a combination of SimpleITK and python functions to segment the brain in brain.nii.gz. And for those that are really adventurous you can use a brain MRI simulator ( <https://brainweb.bic.mni.mcgill.ca/cgi/brainweb1>) to create images with different noise levels and RF inhomogeneities to test your pipeline.