Image Calculator: SubRegion Data

The Image Calculator module performs mathematical operations on volumes, matrices and constant numerical values. The module also contains a number of processing functions including: subregioning (crop), flipping, resizing, shifting etc. This exercise will demonstrate how to use some of these additional processing tools to manipulate your data.

1. Load the **MRI_3D_Head.avw** data set from the **$:\BIR\images\TutorialData** directory.

2. Open the **Image Calculator** module (**Process > Image Calculator**).

3. In the Image Calculator module, right click on the white space and select **Buttons** from the menu options (figure 1).

4. In the **Button Tool**, select the **Region Pad** button from the palette on the left, and drag and drop it onto the Key Pad on the right.

5. After the Region Pad button has been moved to the Key Pad, hit **Apply**. The main Image Calculator key pad will be updated with the additional button option. Close the Button Tool.

6. Now drag and drop your data set from the Analyze workspace onto the Image Calculator process canvas (the white space). This will load the data set into the module and the volume will appear on the canvas.

7. Hit the **Region Pad** button, the Region Pad button's **Subregion-Pad Volume** window will be returned (figure 4).

8. In this window you can subregion the data by entering Low and High values for the X, Y and Z options.
   X Low - Specifies the first column of pixels from each slice to be loaded.
   X High - Specifies the column end point
   Y Low - Specifies the first row of pixels from each image to be loaded
   Y High - Specifies the row end point
   Z Low - Specifies the first slice from the selected volume to be loaded
   Z High - Specifies the slice endpoint
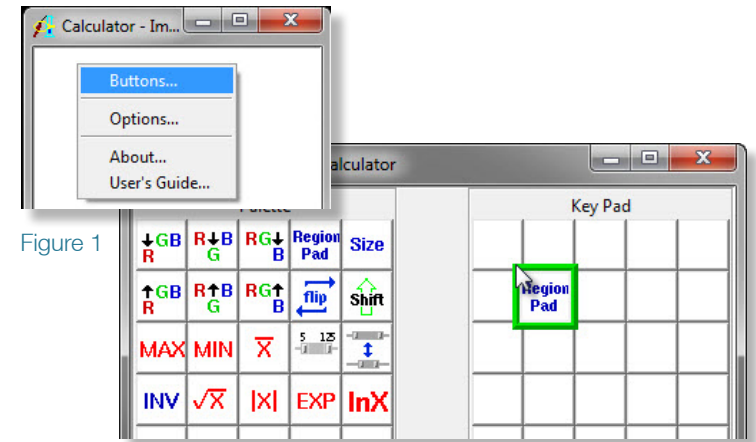
Figure 1

Figure 2

Figure 3

Figure 4

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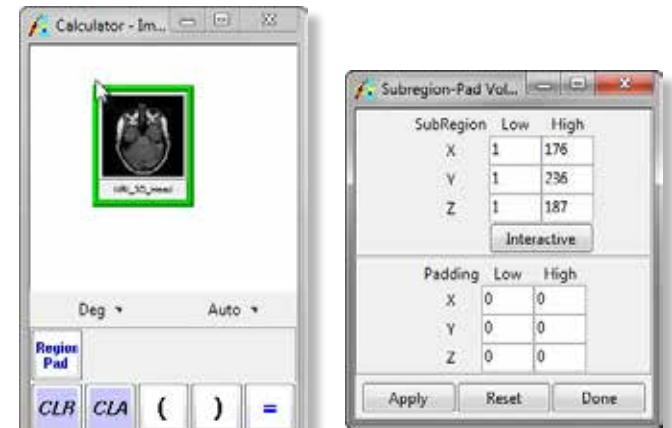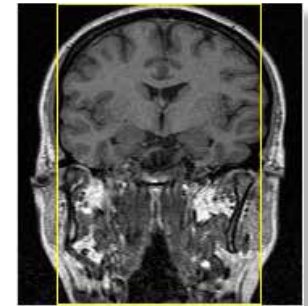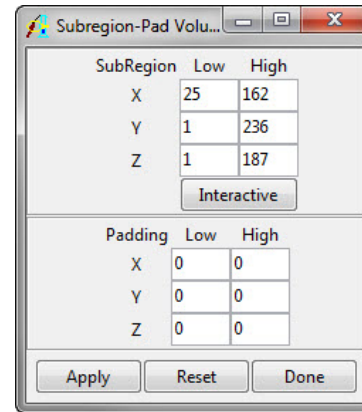
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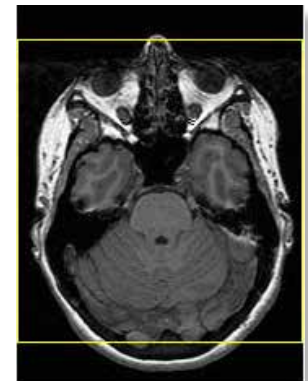9. Click on the **Interactive** button in the Subregion window.
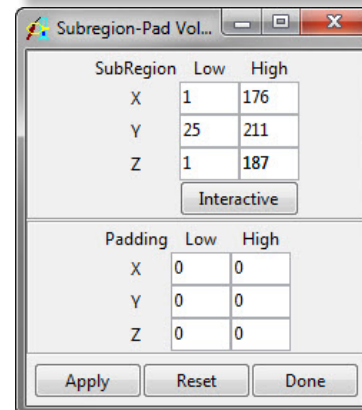
Example 1: Subregioning 50 slices in the X.

- Set the **X Low** value to **25**

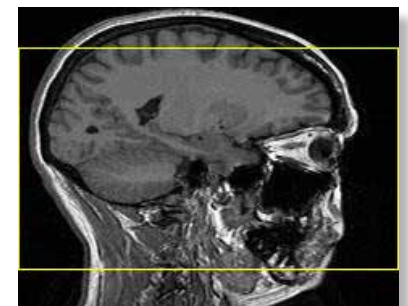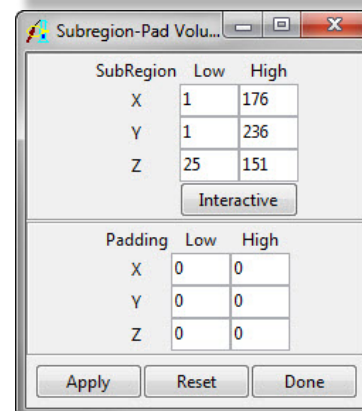- Set the **X High** value to **162**

Example 2: Subregioning 50 slices in the Y.

- Set the **Y Low** value to **25**

- Set the **Y High** value to **211**

Example 3: Subregioning 50 slices in the Z.

- Set the **Z Low** value to **25**

- Set the **Z High** value to **151**

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10. Now use the interactive tool to subregion. Use the tool to trace a bounding box around the area you wish to subregion.

- To define the box, simply click and drag the box on the image display.

- You can review and adjust the box in all three orthogonal orientations, by using the T, C, or S cube icons to change orientations.

- You can review your subregion on all slices prior to applying the subregion, use the slice slider bar to navigate through the volume.

11. A subregion defined in the Interactive tool automatically updates in the X,Y and Z high/low values in the Region Pad Function Option window. To apply a subregion to a data set, hit **Apply** in the Region Pad Function Option window.

12. When you Apply a subregion you will be asked if you would like to apply the changes to the Loaded or if you would like to Change a Copy of the Loaded Volume. Select **Change a Copy of the Loaded Volume**. The changes made to the copy of the data set will automatically be saved to the Analyze workspace.

13. Close all windows associated with Image Calculator before proceeding to the next exercise.