**TASK 1: GETTING STARTED**

Step 1: Install ImagePlot

<http://lab.softwarestudies.com/p/imageplot.html>

The package comes with ImageJ but some users may have to download ImageJ separately:

<https://imagej.nih.gov/ij/download.html>

Step 2: Running Image Plot

1. Open ImageJ
2. Select **File** > **Open** from the top menu bar, and navigate to the **ImagePlot.txt** macro file located inside the **ImagePlot** folder.
3. Choose the ImagePlot.txt file. The macro opens in its own window called **ImagePlot.txt.**
4. To run the macro, select **Macros** > **Run Macro** in the ImageJ menu bar. Alternatively, you can press ctrl-r (⌘R on a Mac).   
     
   Note: If you don’t see the **Macros** > **Run Macro** menu command, click once inside the **ImagePlot.txt** macro window to activate it.
5. You will see the first **ImagePlot** dialogue box.

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**TASK 2: VISUALIZE DATA POINTS**

1. Follow instructions from task 1 to open and run the ImagePlot.txt macro.

3. Select “Open...” from the **Data** drop down menu.  

4. Select “None” from the **Images** drop down menu.

5. Click **OK** button.

6. When prompted to load the Data File, go to **sample\_files** > **van\_gogh,** andchoose the file **van\_gogh\_data.txt** and click **Open** button.

Note: ImagePlot saves the name and location of the the last data file and image directory you use. If you run the macro again and you want to use the same data file and/or image directory, you can select them in Data and Images down down menus.

6. Next you will be presented with the dialog box “ImagePlot: Data column mapping.” This allows you to select which columns to visualize. Select “Year\_Month (Column1)”\* for the **X axis** and “Brightness\_Median (Column2)” for the **Y axis**. Click OK.

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7. The macro will open a new window which will contain the visualization. The macro also writes the values of visualization parameters (width, height, background color, points size, etc.) to **Log** window.

8. To zoom into the the visualization, click on ImageJ toolbox window, and then click on the magnifying glass icon in the middle. You can then repeatedly click inside the visualization window to zoom to %100 view. Alternatively, you can use ImageJ’s **Zoom** command available from its top menu (**Image > Zoom**).

9. To save the finished visualization, you will use ImageJ top down menu. Make sure that the window containing your visualization is active; then select **File** **> Save As**. Choose one of the available image formats, e.g. PNG; type a filename you want use, and click **Save**.

Note: If you saving visualizations using jpeg format, by default ImageJ uses 75 quality setting (0 = min, 100 = max). To change this setting, see [ImageJ documentation](http://rsbweb.nih.gov/ij/docs/guide/userguide-24.html#toc-Subsection-24.13.2). Use 50 for medium quality, or 100 for maximum quality.

10. When ImagePlot starts renders your visualization, it outputs the values of all options set to Log window. If you like, you can save the contents of this window to a text file. To do this, select Log window, go to ImageJ top menu, and select **File** **> Save As**.

**TASK 3: VISUALIZE DATA POINTS**

1. Run the **ImagePlot.txt** macro.

2. Because the data file for this example is the same as that used for the last, select the “../van\_gogh\_data.txt” from the **Data** drop down menu.

3. Select “Open...” from the **Images** drop down menu. Click **OK**.

4. When prompted to load the Image Files, select **van\_gogh\_images** folder in **sample\_files > van\_gogh**.

5. ImagePlot will next display “ImagePlot: Data column mapping” selection box. Because you selected “Open..” in **Images** drop down menu earlier, the selection box now contains a drop down menu for **Image filename**. Choose “Filename (Column0)”from this menu.

Note: you can use any label instead of “Filename” for the column containing image files names; we choose this label to make sample data files more readable.

6. Select “Year\_Month (Column1)” for the **X axis** and “Brightness\_Median (Column2)” for the **Y axis**, as in the previous example. Click **OK**.

7. The macro will start running, and you will see images being added to the visualization. Because ImagePlot now has to manipulate much more data - every pixel in every image - the progress is slower. ImageJ shows this progress in real-time via the **progress bar** displayed in in the lower right hand corner of the toolbox window.

8. When the **progress bar** disappears, this means that visualization is finished. Go to the **File** menu in ImageJ and click on **Save** the visualization.

**TASK 4: VISUALIZING TWO FEATURES**

1. Run the ImagePlot.txt macro again and select the “../van\_gogh\_data.txt” for **Data** and “../van\_gogh\_images” for **Images.**

2. In the next dialog box, select “Filename (Column0)” from the I**mage Filename** drop down menu, “Brightness\_Median (Column2)” for the **X axis**,and “Saturation\_Median (Column3)” for the **Y axis**.

**TASK 5: VISUALIZE IMAGES USING FILE PATHS**

1. Go to **van\_gogh > filepaths\_example** folder.

2. Open van\_gogh\_data\_filepaths.txt in Excel or a text editor, and replace all occurrences of “/Volumes/SWS02/projects/ImagePlot-Release/” with the actual path to **filepaths\_example** on your computer.

3. Run the ImagePlot.txt macro.

4. Select “Open…” from the **Data** drop down menu.

5. Select “Paths in datafile” option from the **Images** drop down menu. Press **OK**.

6. When prompted to load the Data File, select van\_gogh\_data\_filepaths.txt.

7. When “ImagePlot: Data column mapping” selection box appears, Choose “Filename (Column0)” from this menu.

8. Select “Year\_Month (Column6)” for the **X axis** and “Brightness\_Median (Column7)” for the **Y axis**.

9. The macro will render a visualization which will contain images from both van\_gogh\_images\_Paris and van\_gogh\_images\_Arles folders.

**TASK 6: MEASURING AND VISUALIZING FEATURES OF NEW IMAGES**

1. Download **liu\_kang\_images.zip** from edimension. Add the folder to a new “Liu Kang” folder in **sample\_files** in **imageplot**.

2. Start ImageJ.

2. Select **File** > **Open** from the top menu bar, and navigate to the **ImageMeasure.txt** macro file located inside the **extras** folder of the ImagePlot distribution.

3. Choose **ImageMeasure.txt** file. The macro opens in its own window in ImageJ, titled **ImageMeasure.txt**.

4. To run the macro, select **Macros** > **Run Macro** in ImageJ menu bar. Alternatively, press ctrl-R (Windows) or ⌘R (Mac).   
  
Note: If you don’t see **Macros** > **Run Macro** menu command, click once inside the **ImageMeasure.txt** macro window to activate it.

5. You will be prompted to select a folder containing images and folders to process. Select the folder **liu\_kang\_images**.

6. The macro will run, outputting its progress to the **Log** window in ImageJ. Once complete, the tab-delimited text file(image\_dimensions.txt)containing the information about the images will be save in the folder you selected for processing. The following information is saved for each image: image width (jn pixels), image height (jn pixels), image proportion (height/width), and a file path.

7. Use the saved **measurements.txt** file to create a spreadsheet for your data. (If you are using excel etc. you will need to save this data again as a **Tab-delimited text** (.txt) file.

8. Follow task **5** again using this new dataset.

**TASK 7: USING NEW PLUGINS FOR IMAGEJ**

ImageJ Analyze Menu:

<https://imagej.nih.gov/ij/docs/menus/analyze.html>

Plugins available for ImageJ:

<https://imagej.nih.gov/ij/plugins/>

1. Explore the Plugins available in the above link.

2. Download the Java file of the Plugin (i.e. Color\_Counter) and put it in the “plugins” folder of ImageJ.

3. In ImageJ, click **Plugins** then **Compile and run…**

4. Then restart ImageJ. Your Plugin should now be on the Plugin menu.

5. Open an image in ImageJ, click **Plugins** and select your Plugin.