Instructions

Prerequisites

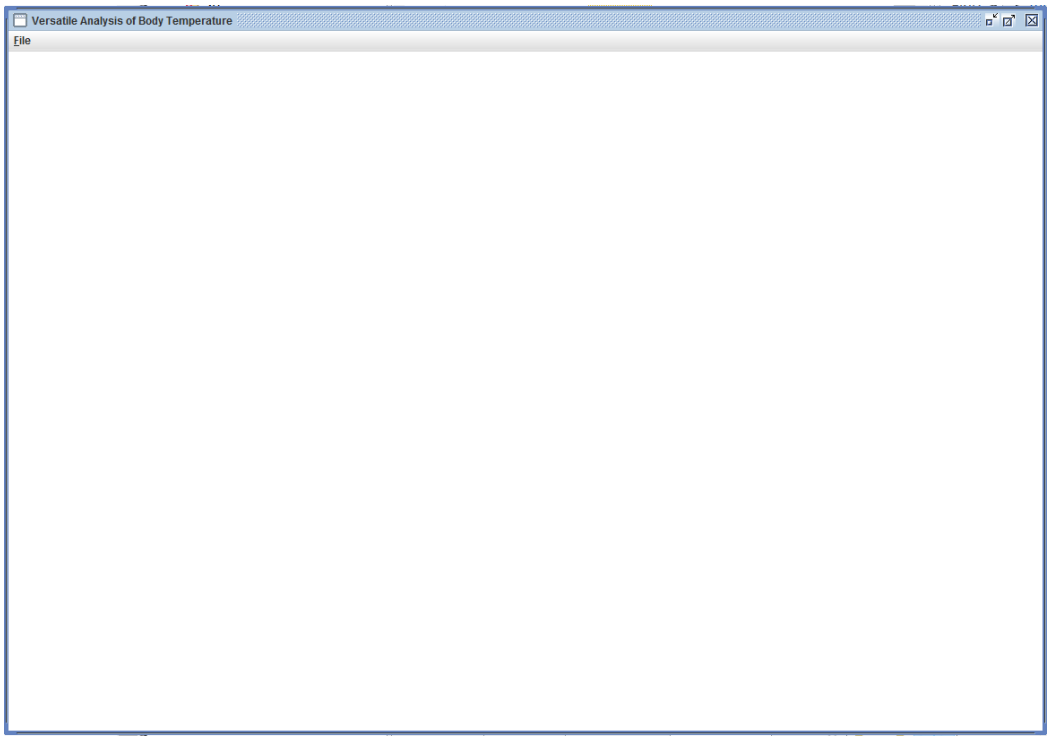
The only prerequisites for the program are that it can run Java SE 6 (1.6.0) or later. This implies that the minimum requirements for the system are:

- Mac OS X
  - 10.5 (Leopard) running 64bit processors, or
  - 10.6 (Snow Leopard) or later
- Windows
  - Windows Vista or later
- Linux
  - Red Hat Enterprise 5.5+1 or later
  - Ubuntu 13.x or later

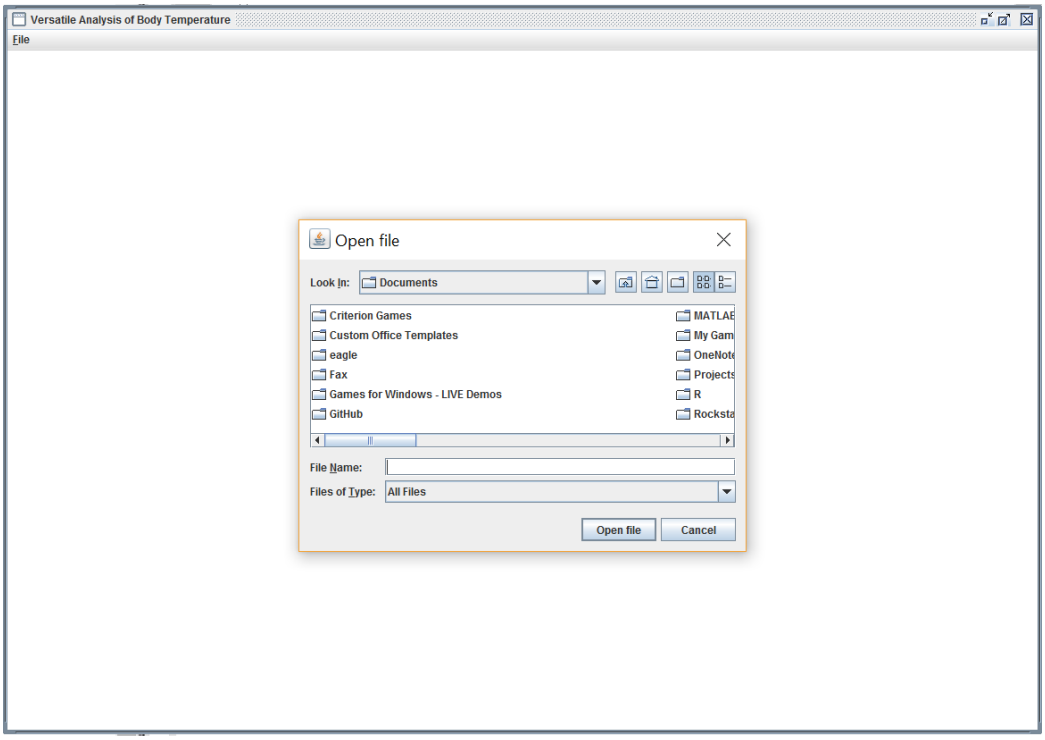
If the required Java version is not installed it can be found at: https://java.com/en/download/.

Running the System

1. To run the program simply navigate to the location of the executable .jar file and double click. A window should open up as below. If the window does not open right click on the .jar and select open with javaw.exe (or Jar Launcher on Mac).



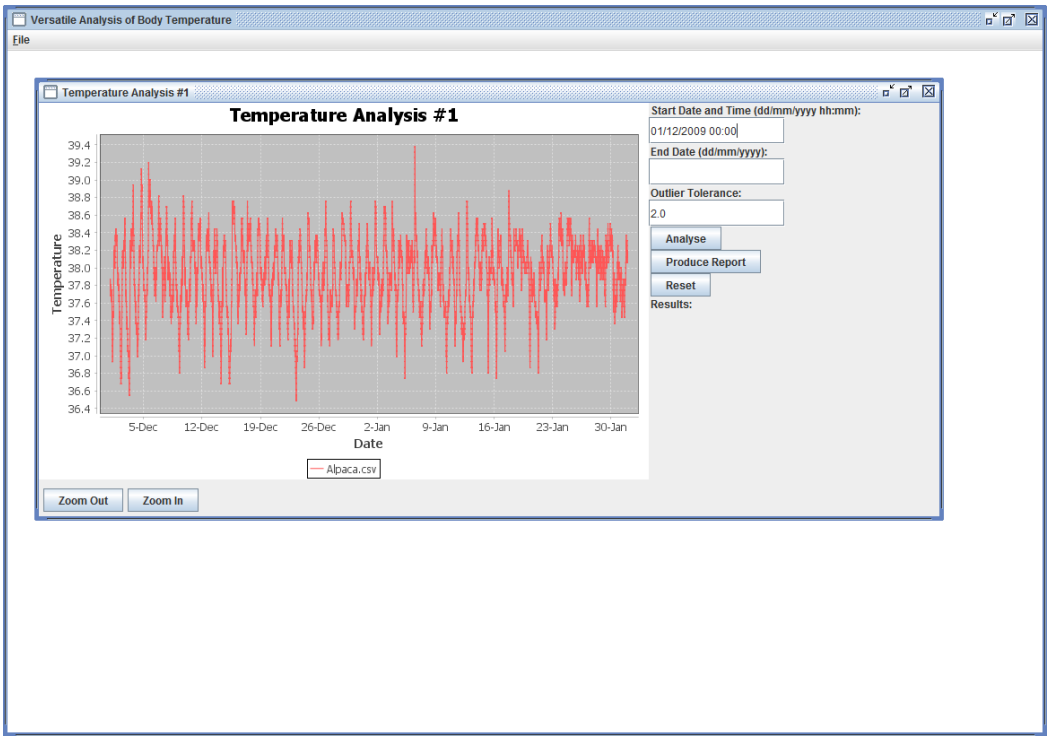
2. Once that window has opened the data logger file must be loaded into the program. To do this select the **File** drop down menu and select **Open** from the options. A standard explorer window should pop up as below so that you may navigate to the required file.



It is important to note that the files need to be in the following format for the program to recognise them properly. Any other format will produce an error. This format is one header line (content irrelevant), and then date and double pairs. Beyond the formatting of the csv other requirements include requiring the data to span at least one 24 hour period and the sampling rate must divide evenly into 24hours.

```
Date,Carot 1
19/03/2007 12:00,38.60941761
19/03/2007 12:05,38.55542145
19/03/2007 12:10,38.60941761
19/03/2007 12:15,38.55542145
19/03/2007 12:20,38.50142529
19/03/2007 12:25,38.50142529
19/03/2007 12:30,38.45822836
19/03/2007 12:35,38.45822836
19/03/2007 12:40,38.45822836
19/03/2007 12:45,38.45822836
19/03/2007 12:50,38.45822836
19/03/2007 12:55,38.20984602
```

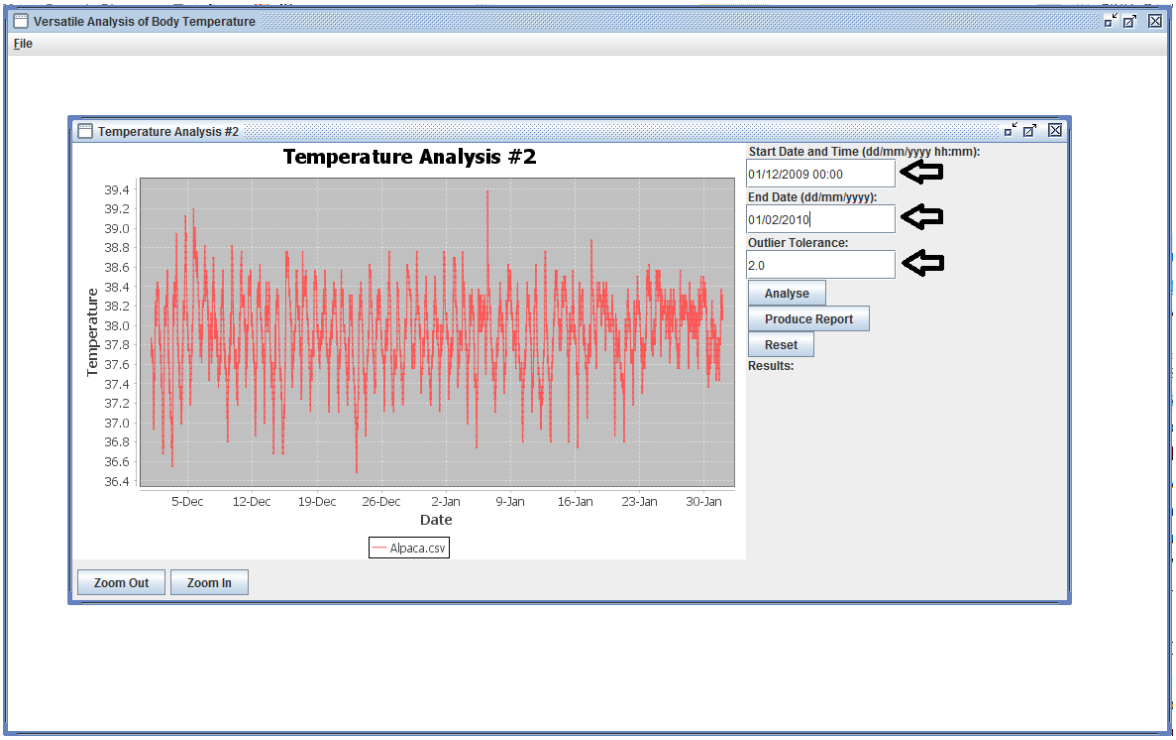
Once an appropriate file has been opened the following window should be produced. (Note: this may take a few seconds; this is normal)



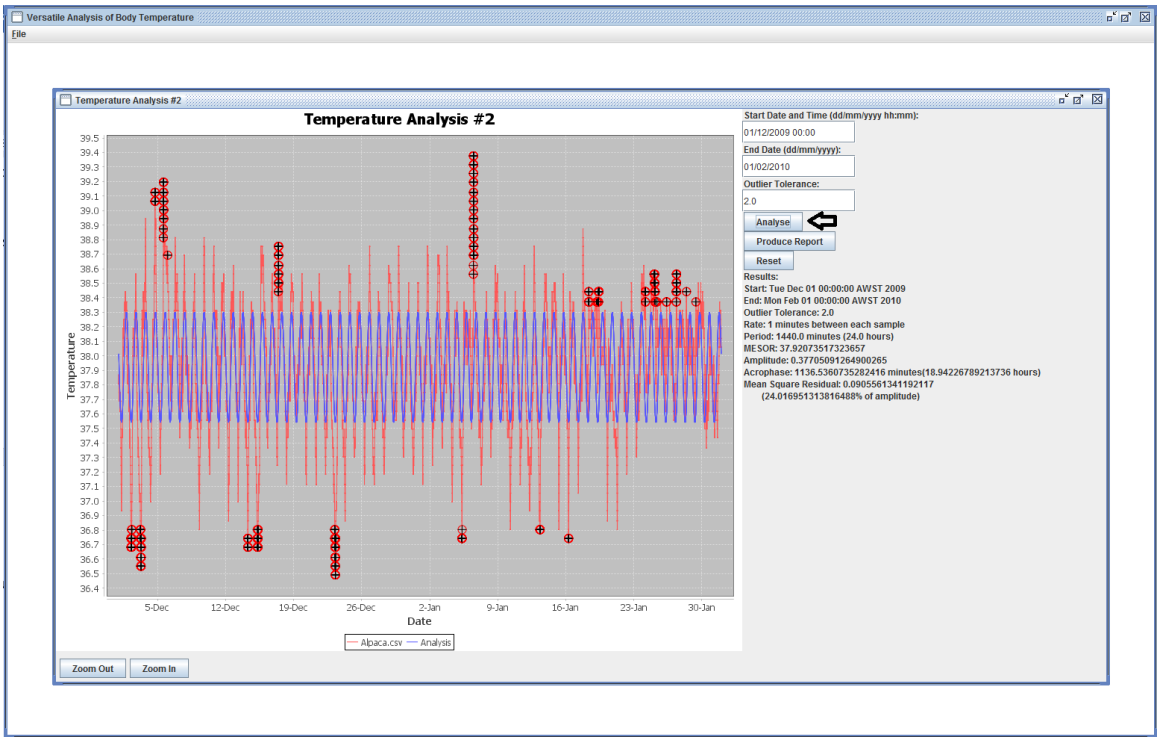
3. At this point you can observe the data and review what sections of data to analyse. The system supports a number of methods to do this including:
    a. Left Mouse Click + Drag Up = reset graph zoom
    b. Alt + Click + Drag = pan (Mac)
    c. Ctrl + Click + Drag = pan (Win)
    d. Click + Drag = zoom window
    e. Right Mouse Click = options on the graph (including save as image)

4. From here the analysis can be done on that data by specifying a number of parameters shown below.
    a. Start Date and Time (dd/mm/yyyy hh:mm)
        i. Defines the start time for the analysis and moves the graph to zoom into that time.
    b. End Date (dd/mm/yyyy)
        i. Defines only the end date so that the program will complete analysis only in 24hr blocks. This means that analysis starts and ends at the same time on different dates.
    c. Outlier Tolerance
        i. Sets the number of amplitudes

Note: When entering parameters into boxes press Enter, on the keyboard, after typing otherwise the values will not be entered.



5. Once the parameters are set, selecting the **Analyse** button just below produces:



Note that the red circles with a black cross represent the locations of data points that are outliers.

6. The analysis over the selected dates produces the results shown in the program under the **Results** heading. By selecting the Produce Report button, the results are printed to a text file in the same location as the input data. The produced text file contains:

Results for Alpaca.csv	
Start Date	1/12/2009 0:00
End Date	1/02/2010 0:00
Period (hours)	24
MESOR	37.92073517
Amplitude	0.377050913
Acrophase (hours)	18.94226789
Outliers: (Tolerance = 2.0):	
02/12/2009 06:23-02/12/2009 07:29	
2/12/2009 7:32	
02/12/2009 07:51-02/12/2009 08:11	
03/12/2009 05:26-03/12/2009 07:33	
04/12/2009 17:26-04/12/2009 17:54	
05/12/2009 14:08-05/12/2009 15:08	
06/12/2009 00:46-06/12/2009 00:47	
14/12/2009 06:40-14/12/2009 07:13	
15/12/2009 5:54	
15/12/2009 06:16-15/12/2009 07:53	
15/12/2009 08:00-15/12/2009 08:05	
Periodogram	
period (minutes)	value
89280	0.026294888
44640	0.007793826
29760	0.022720899
22320	0.005760229
17856	0.031427588
14880	0.044260685
12754	0.010477652
11160	0.006862162
9920	0.028311687
8928	0.026703709

This file identifies a number of important analysis parameters including:

a. Start and end dates of analysis
b. Outlier Tolerance
    i. The number of amplitudes away from the fit curve which defines an outlier
c. Rate
    i. The sample rate of the input data

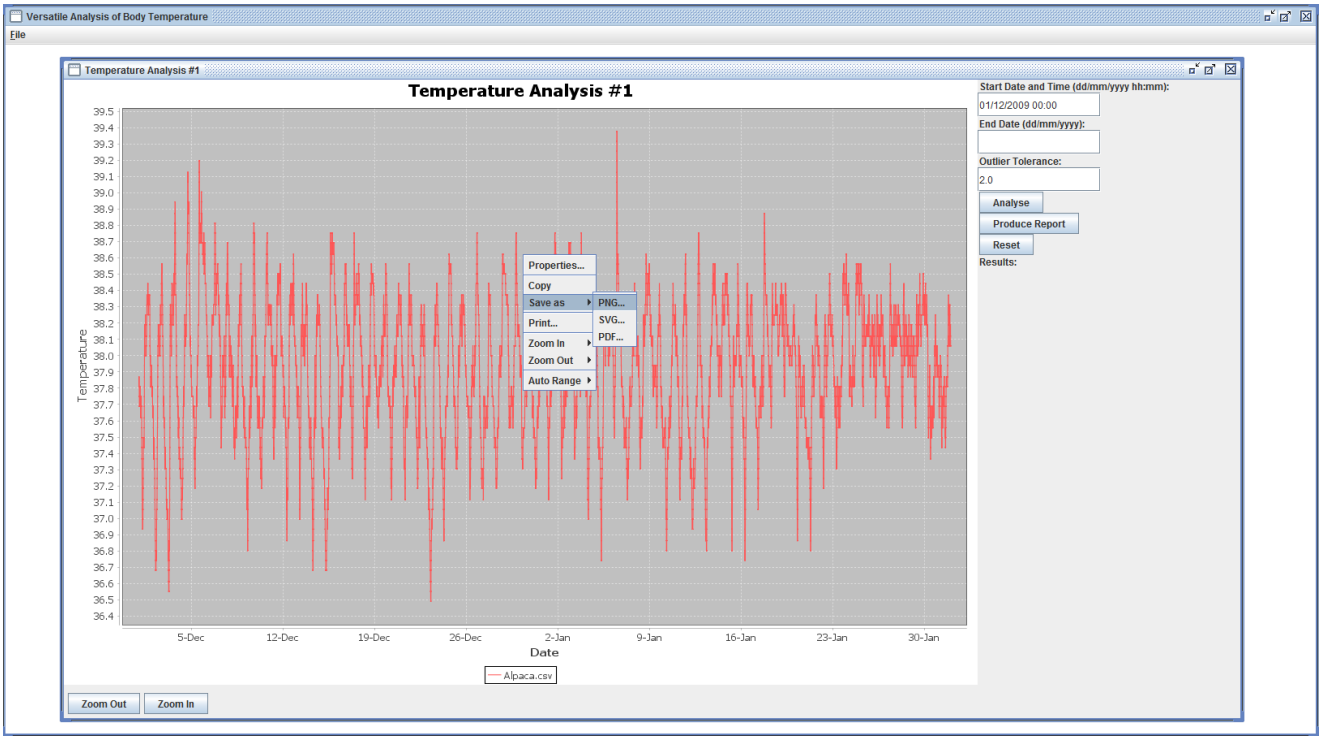
d. Period
    i. Period determined by the analysis
e. MESOR
    i. Effectively the mean of the fit
f. Amplitude
    i. Amplitude of the fit
g. Acrophase
    i. The time at which the first peak of the sinusoid occurs from the start time of the analysis.
h. Mean Square Residual
    i. Represents the sum of the squares of the residuals, to show the discrepancy between the fit and the actual data
i. Outliers
    i. A list of ranges and values
j. Periodogram
    i. The results from the Periodogram analysis

7. To return to viewing the original data without analysis select the **Reset** button.

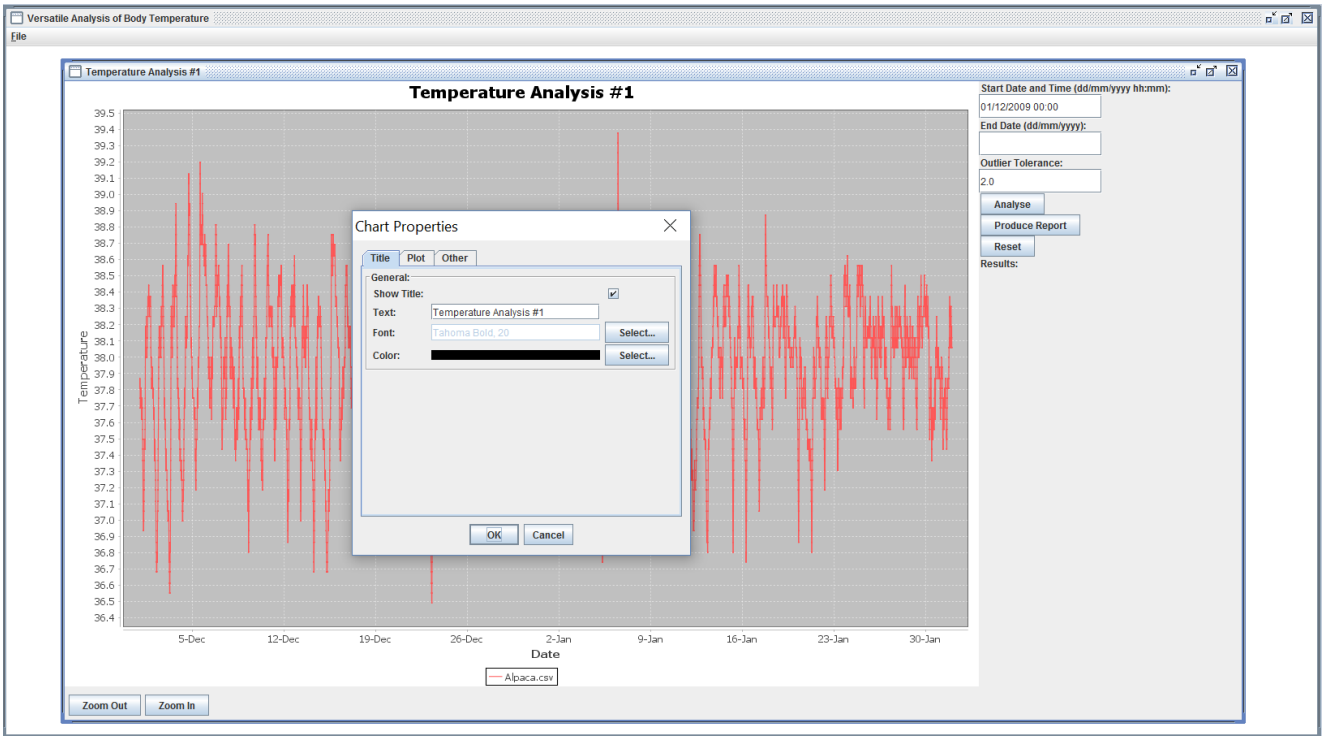
Important Other Functionality

Some other functionality is built into the system which allows for:

1. Saving the graphs as images
    i. Right Mouse Click on the graph and select save as image.



2. Changing the labels and titles
    i. Right Mouse Click on the graph and select properties, which brings up all the settings available to modify the graph.



3. Analysing and plotting multiple files in the one window
    i. Simply open a second file just as the first was opened.