

In order to get and run this program, you must have Python 3 installed on your system. Using the Anaconda distribution is highly recommended, which is available here:

<https://www.anaconda.com/download/> .

Getting the Program:

1. Go to www.github.com/curtisa1/ICQSplitter
2. Click the green "Clone or Download" button and hit "Download Zip"
3. Open the downloaded zip
4. Drag the file "ICQ Splitter-master" into your desktop for easier access when running the program

Running the Program:

1. Go into the "ICQSplitter-master" file
2. Copy the "ICQSplitter.py" file into the "example_data" file
3. Go into your command prompt or terminal, which can be accessed by searching it through Start or Cortana on a Windows product, or through the spotlight icon on a Mac product
4. In the command prompt, type "pip install callhorizons" and hit enter; this is to ping JPL for data on specific comets or other objects
5. To get to the program, type "cd desktop" and hit enter
6. Then, type "cd icqsplitter-master" and hit enter; type "cd example_data" and hit enter
7. To run the code and receive an output of reasons why data points were deleted, just type "cd python icqsplitter.py" and hit enter
8. To run the code and receive an output of data of the comet in the code with heliocentric corrections, type "python icqsplitter.py --heliocentric" and hit enter
9. Phase angle corrections can also be done to the data of the comet by typing "python icqsplitter.py --phase" and hitting enter
10. Statistical analysis can be run on the data by typing "python icqsplitter.py --stats --_(helio. or phase)_ " and hitting enter, but it must also have one or both heliocentric and phase corrections
11. To receive data with both corrections and the statistical analysis, type "python icqsplitter.py --heliocentric --phase --stats" and hit enter
12. To receive lightcurve plots of the data with all the corrections and analyses, type "python icqsplitter.py --heliocentric --phase --stats --plot" and hit enter

Seeing Data Corrected:

1. Go to the file "ICQSplitter-master" on the desktop
2. Open the "example_data" file
3. Open the "keepers.csv" excel sheet
4. Go to the far right of the sheet until the moving bar stops
5. The "Z" column shows the comet data corrected for either heliocentric distance or phase angle, and the "AA" column shows the comet data corrected for both heliocentric distance and phase angle –if the code had been run to receive data for both corrections at once that is.

Changing the Code for other Comets:

Downloading the Data of the New Comet:

1. Go to <https://cobs.si/analysis>
2. Go to the drop-down bar and select the name of the new comet
3. Select the start and end date of observations -make sure the time range is of 4-5 years and that there's only one perihelion encounter within the date range.
4. Select either visual or CCD measurements
5. Select "Get Obs"
6. Scroll to the bottom of the page and hit "Save"
7. Download the file and save it into a new folder in the "ICQSplitter-master" file; copy the "ICQSplitter.py" code, and the file "Schleicher_Composite_Phase_Function.txt" into the new folder as well.

Editing and Changing Input Arguments for the New Comet:

For this, an editor is needed. For Mac products, there is a default editor that comes with the system. Windows products on the other hand, an editor is needed. Notepad++ is recommended

1. Open the python code using an editor, e.g. Notepad++
2. Go to the line "input_file" and copy-paste the name of the downloaded file of the new comet.
3. Change "target nickname" to the name of the comet
 - 3a. If the code doesn't work, try using the record number for the comet instead by going to <https://ssd.jpl.nasa.gov/horizons.cgi>, changing the target body and the time span -writing the same start and stop time used in COBS- and generating the ephemeris. The record number is under the "object data page" table on the second line, which reads "Rec #: number"
4. Change the "small_body_designation" to the name of the new comet.
5. Use the perihelion date that coincides within the start and end dates chosen, which can be found in the comet's wikipedia page or in the COBS page.
6. If the data file in the input_file line is of only visual data, put a 1 in the "CCD_Bool" line, or a 0 if it's only CCD data.
7. Save and run the program, but now go into the new folder with the new data ("cd *new folder name*" instead of "cd example_data") using the steps from the previous sections above.