Astroinformatics

Project Practice 1

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1 Objective

In this report our objective is put in practice what we learned in class, using different methods to reach the different goals, using astronomical software like TOPCAT or DS9

2 Downloading Light curves

The firs task we need to complete is visit the mikulski archive for Space Telescopes and downloading the next archive **tesscurl_sector73_lc.sh**

Lightcurve			
Sector 76	Light Curve	tesscurl_sector_76_lc.sh	DC
Sector 75	Light Curve	tesscurl_sector_75_lc.sh	DC
Sector 74	Light Curve	tesscurl_sector_74_lc.sh	DC
Sector 73	Light Curve	tesscurl_sector_73_lc.sh	DC
Sector 72	Light Curve	tesscurl_sector_72_lc.sh	DC
Sector 71	Light Curve	tesscurl_sector_71_lc.sh	DC
Sector 70	Light Curve	tesscurl_sector_70_lc.sh	DC
Sector 69	Light Curve	tesscurl_sector_69_lc.sh	DC
Sector 68	Light Curve	tesscurl_sector_68_lc.sh	DC
Sector 67	Light Curve	tesscurl_sector_67_lc.sh	DC
Sector 66	Light Curve	tesscurl_sector_66_lc.sh	DC

Figure 1: Download light curves

A common error is try to run the script without verify if we have install the package to download the archives from the server, another common error is try to run it without put in terminal chmod +x

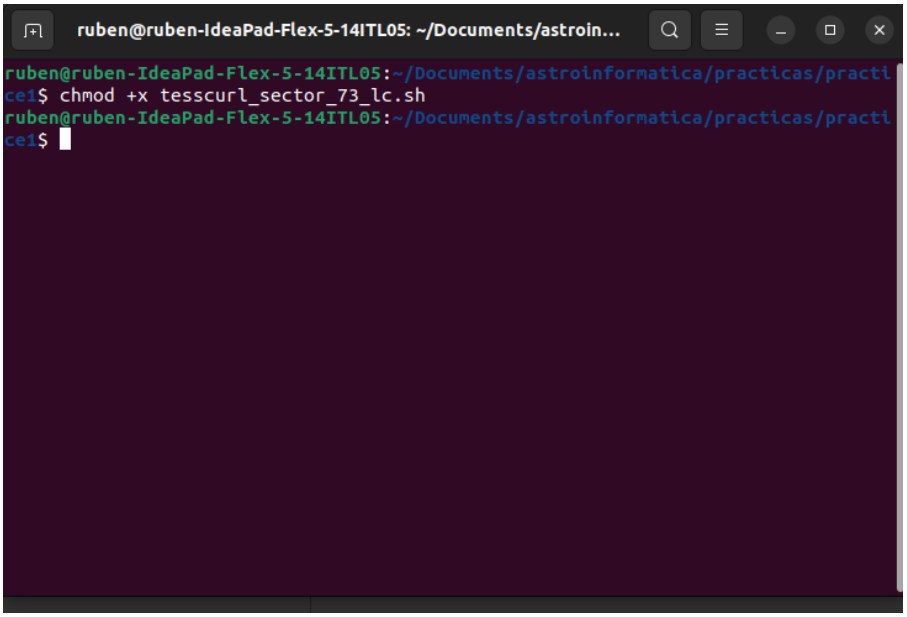

Figure 2: Bash script

After we downloads the 15 or 20 files approx we must stop the script. Once we have our

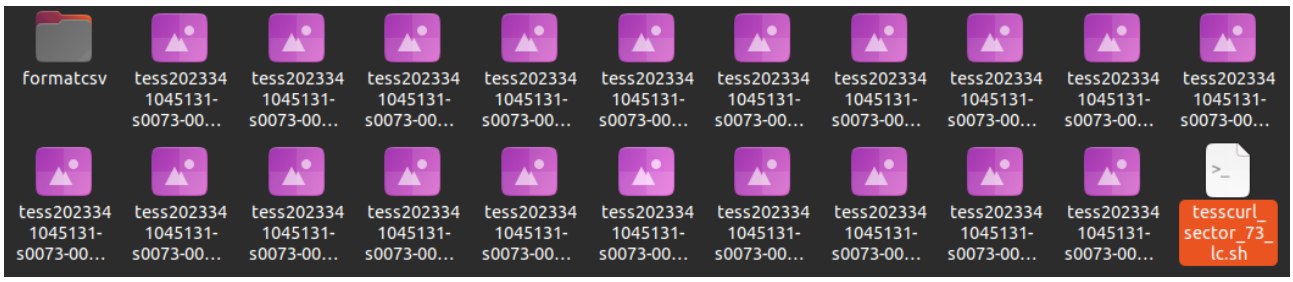

Figure 3: Light-curves files

files we need to open TOPCAT and save this files in the output format.CSV

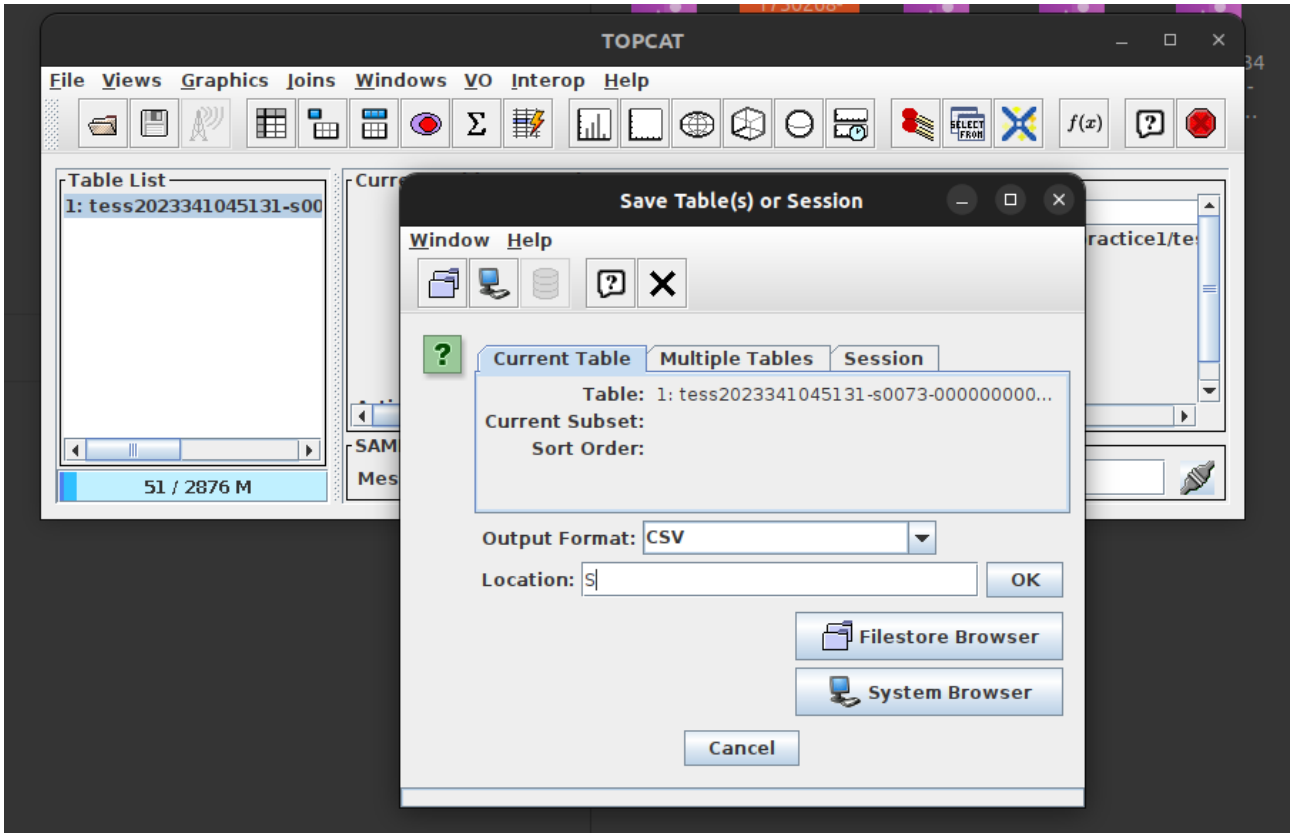

Figure 4: saving file in CSV format

3 Shell Scripts

Making script is one of the most important things we must to do in order to be efficient when we work with a lot of astronomical data, so our first task is writing a script to output a file containing all the file names of our CSV files. We write **ls *.CSV output1_files.txt** in order to create a file text that save all the files names of our CSV format.

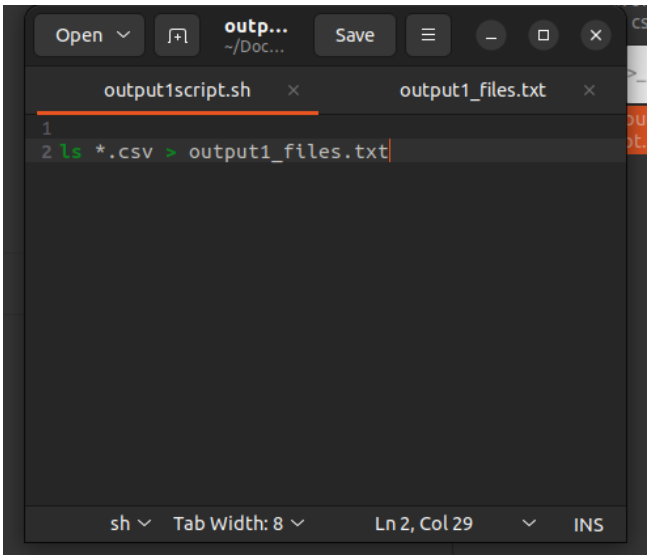

Figure 5: script to output a file

The result of this script is:

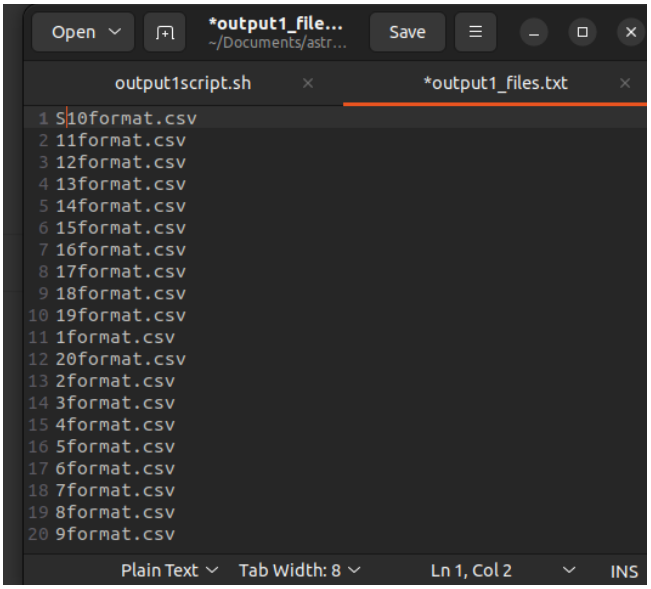

Figure 6: file with all CSV

3.1 Split files

The next thing to do is write a shell script to split this file containing all the file names into small files containing only 5 of each and run it. For this we must investigate a little more how to do it we find to do this is with this script so we find
split -l 5 output1_files.txt split_file.txt [1] is the correct line to split files (this code don't belong to me)

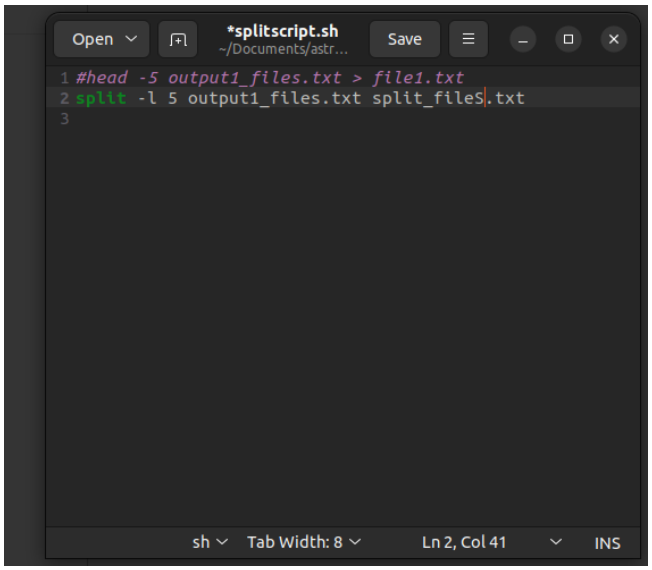

Figure 7: Line to split files

The result of this script is 4 files in which we have 5 files (20 in total) with names from aa to ad but we can change this prefix with the sintax **split [options] name_of_file prefix_for_new_files** [1]

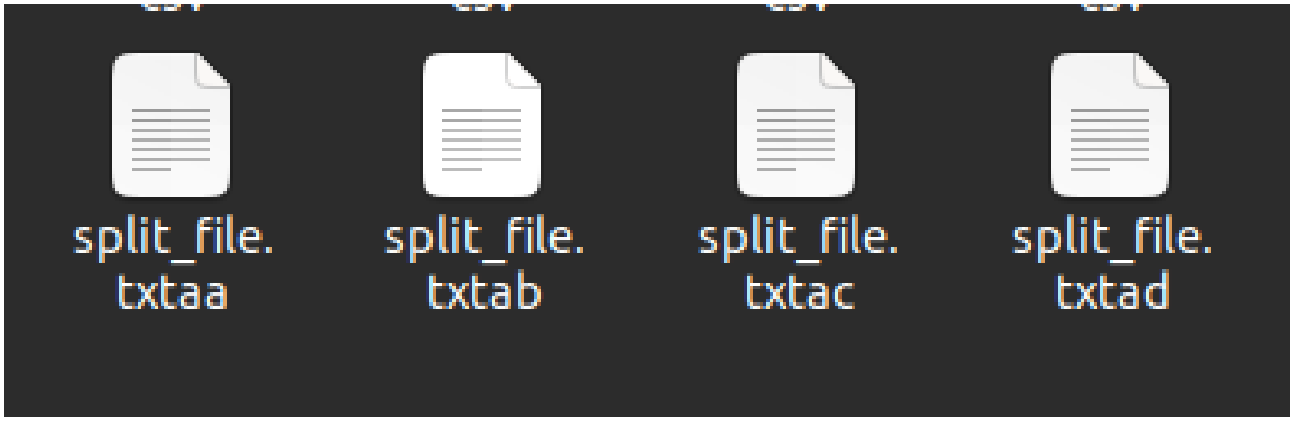

Figure 8: Split files

4 Light Curves

Now the next step is open TOPCAT and plot their light curves for doing so we need to identify the correct plot type and relevant columns in order to do this we open de CSV file with TOPCAT and we do double click in table list and it's show this:

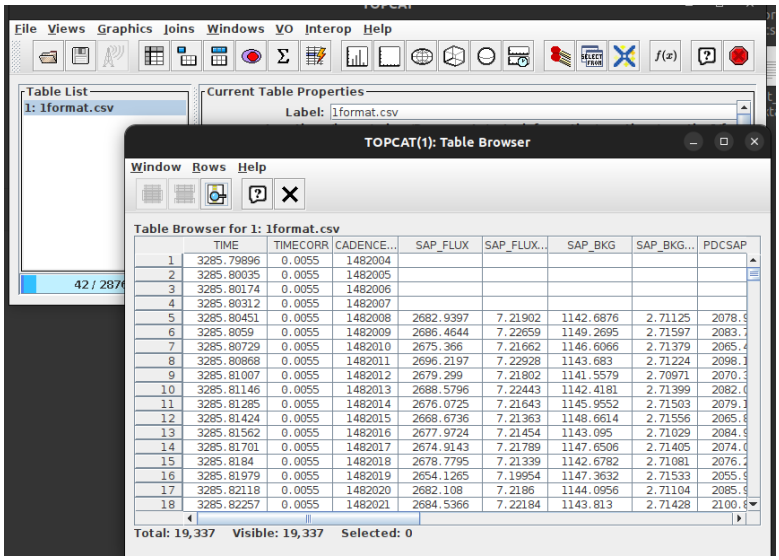

Figure 9: TOPCAT TABLE

So we can see the information on the columns like the flux and time that is we are looking for in order to graph this lightcurves we can see that we can change the scale of time and the axe y as function of flux or other things.

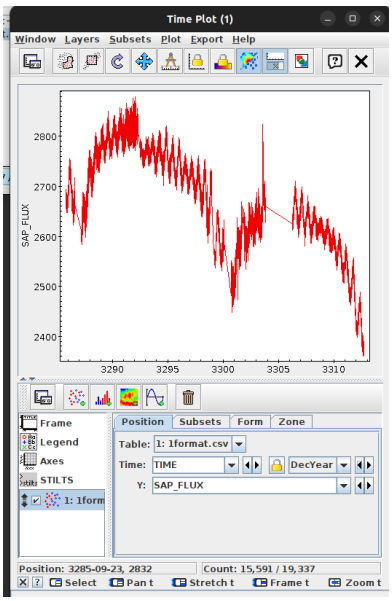

Figure 10: TOPCAT Graph

5 Questions

1) Where does TOPCAT get the units from?
R//TOPCAT can get the information in several form but the most used is the metadata where TOPCAT can get the information of units [2]

6 Conclusion

In this practice we learned to write script for splitting and download files,also we learned about using TOPCAT how to open the files in columns and making plot of the lightcurves vs time, we search about how TOPCAT get the units from and we could solve problems about writing code

References

[1] `https://www.geeksforgeeks.org/split-command-in-linux-with-examples/`.

[2] `https://www.star.bris.ac.uk/ mbt/topcat/sun253.pdf`.