

Informatics for Astronomers - WS2020

Roland Ottensamer, Marina Dütsch, Miguel Verdugo, Gerald Mösenlechner

Exercise sheet 7 - Bash and Fortran

The following will be also part of the assessment:

(1) Try to present exercises in a way that everyone can understand (even those who didn't do the exercises), so please explain the vital parts of your solution in a clear way.

(2) Try to also include some background information where applicable, and/or explain the possible context/motivation for the given exercise.

1. Take the python calculator from Exercise 04, Example 1 and implement it as a bash script.
2. Take the file `Photometry_V_Band.txt`. This file contains photometric and positional data of over 6000 stars. The first column contains the ID of the stars, the second and third contain the X and Y position and the fourth column contains the flux in ADU (Analog-Digital Units). Use `awk` to select all stars in a $500 \times 500 \text{px}^2$ around the center (1000, 1000) and write the result to a new file. Then sort the file based on the flux.
3. Write the result from python's "import this" into a .txt file (how you do this is up to you). Then use the `sed` command line tool to search and replace a word of your choosing with a different one and save the result to a new file.
4. Write a simple shell script that takes the `Photometry_V_Band.txt` and counts the number of stars inside of a 300px radius around the center (1000,1000). The script shall then print the resulting number and the ID and signal of the brightest star inside of that region.
5. Write a Fortran program that uses the Babylonian Method to calculate the approximate square root of 42.