Informatics for Astronomers - WS2020

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Exercise sheet 6 - 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.

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1. Take the `python` calculator from Exercise 04, Example 1 and implement it as a `bash` script.

2. Take the file `Photomety_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 500×500 pixel^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 `ascii` 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. Using a `bash` script, find the `N` largest files in your `$HOME` and copy them to another location. `N` is an argument (integer) provided by the user when running the script.

5. Write a `Fortran` program that uses the Babylonian Method to calculate the approximate square root of 42.