Computational Physics, FC 2020-1

Homework 1

August 12, 2019

Carlos Gerardo Malanche Flores & Víctor Alfredo Milchorena Gonzáles

For the moment, the homework is to be sent via e-mail to both addresses `malanche+fcfc@ciencias.unam.mx` and `vmilcho+fcfc@ciencias.unam.mx`. Due date: **August 25 2019, 23:59:59**.

Task 1: `average.sh` (*)

Create a *shell script* that receives as only argument the name of a file, and computes the average of the second column in this hyphen-separated text file.
Example Input: `./average.sh basic_file.txt`
`basic_file.txt`:

```
Carlos-10
Ana-9
Jorge-7
Diana-6
Andres-9
Tamara-9
Victor-10
Elisa-8
Jesus-5
```

Example Output: `8.11111111`

Task 2: `weird.sh` (**)

Create a *shell script* that receives the name of a file as first argument, and a word for second argument. The script needs to compute the sum of the line-numbers where the provided word (as second argument) was found.
Example Input: `./weird.sh sample_file.txt of`
`sample_file.txt`:

```
This kind of file is a very simple
file that tries to avoid the use of the
word of, so that it does not appear in every
line.
```

Example output: `6` (which comes from 1+2+3, where "of" appears)

Task 3: `ecliptica.sh` (*)

Create a *shell script* that tells me the angle between the normals of the ecliptic plane and the ecuatorial plane, at the moment of execution. To accomplish the task, take into account the following considerations:

- A **sine** or a **cosine** are good enough to approximate the movement of the sun across the year.
- The maximum angle is 23.27, and takes place on the 21st of December and the 20th of June).
- The summer solstice must be the maximum, not the minimum.
- The year has **always** 365 days.

If you take into account the time (hour, minute and second of execution), it will be a **great** plus.