Quakeledger: a web service to serve earthquake scenarios. (https://doi.org/10.5880/riesgos.2021.003)

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1. Licence

2. Citation

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Link to Quakeledger on GitHub:
https://github.com/gfzriesgos/quakeledger/

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3. Description

This version of Quakeledger (V.1.0) is a Python3 program that can also be used as a WPS (Web Processing Service). It returns the available earthquake events contained within a given local database (so called catalogue) that must be customised beforehand (e.g. historical, expert and/or stochastic events).

This is a rewrite from: *https://github.com/GFZ-Centre-for-Early-Wrninga/quakeledger* and *https://github.com/bpross-52n/quakeledger.* In these original codes, an earthquake catalogue had to be initially provided in .CSV format. The main difference with this version is that, this code is refactored and uses a SQLITE database. The user can find the parser code in: "quakeledger/assistance/import_csv_in_sqlite.py"

4. Requirements and setup

The following python modules need to be installed:

- pandas
- scipy
- sqlalchemy
- lxml
- numpy

You can use a virtual environment and the requirements.txt:

```
python3 -m venv env
source env/bin/activate
pip install -r requirements.txt
```

You also must make sure that you extract the SQLite database (which is zipped here because of file size policies on Github).

```
unzip sqlite3.db.zip
```

You can make sure that the script works by running
python3 test_all.py

The user can find some examples of the fields that make up the originally proposed .CSV files in: https://github.com/GFZ-Centre-for-Early-Warning/quakeledger. It is worth to remark that these events are meant to fulfil the minimum inputs required to construct a finite earthquake rupture using some auxiliary codes of OpenQuake Engine (Pagani et al., 2014) and that can be used by other subsequent processes. Therefore, the minimum ones that must be provided are:

- eventID, unique id of the event.
- longitude, longitude in fraction of degrees
- latitude, latitude in fraction of degrees
- depth, depth in kilometres
- magnitude, moment magnitude (Mw)
- rake, rake angle (degrees)
- dip, dip angle (degrees)
- strike, strike angle (degrees)

5. Related work

- https://github.com/GFZ-Centre-for-Early-Warning/quakeledger
- https://github.com/bpross-52n/quakeledger
- https://github.com/gfzriesgos/quakeledger/

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7. References

Pagani, M., Monelli, D., Weatherill, G., Danciu, L., Crowley, H., Silva, V., Henshaw, P., Butler, L., Nastasi, M., Panzeri, L., Simionato, M., Vigano, D., 2014. OpenQuake Engine: An Open Hazard (and Risk) Software for the Global Earthquake Model. Seismological Research Letters 85, 692–702. https://doi.org/10.1785/0220130087