TLE-tools

Release 0.2.0

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CONTENTS:

TLE-tools is a small library to work with two-line element set files.

CHAPTER

ONE

PURPOSE

The purpose of the library is to parse TLE sets into convenient `TLE` objects, load entire TLE set files into `pandas.DataFrame`'s, convert `TLE` objects into `poliastro.twobody.Orbit`'s, and more.

From Wikipedia:

> A two-line element set (TLE) is a data format encoding a list of orbital elements of an Earth-orbiting object for a given point in time, the epoch. The TLE data representation is specific to the simplified perturbations models (SGP, SGP4, SDP4, SGP8 and SDP8), so any algorithm using a TLE as a data source must implement one of the SGP models to correctly compute the state at a time of interest. TLEs can describe the trajectories only of Earth-orbiting objects.

Here is an example TLE:

```
ISS (ZARYA)
1 25544U 98067A   19249.04864348  .00001909  00000-0  40858-4 0  9990
2 25544  51.6464 320.1755 0007999  10.9066  53.2893 15.50437522187805
```

Here is a minimal example on how to load the previous TLE:

```
from tletools import TLE

tle_string = """
ISS (ZARYA)
1 25544U 98067A   19249.04864348  .00001909  00000-0  40858-4 0  9990
2 25544  51.6464 320.1755 0007999  10.9066  53.2893 15.50437522187805
"""

tle_lines = tle_string.strip().splitlines()

t = TLE.from_lines(*tle_lines)
```

Then `t` is:

```
TLE(name='ISS (ZARYA)', norad='25544', classification='U', int_desig='98067A',
epoch_year=2019, epoch_day=249.04864348, dn_o2=1.909e-05, ddn_o6=0.0, bstar=4.0858e-
↪05,
set_num=999, inc=51.6464, raan=320.1755, ecc=0.0007999, argp=10.9066, M=53.2893,
n=15.50437522, rev_num=18780)
```

and you can then access its attributes like `t.argp`, `t.epoch`...

CHAPTER

TWO

INSTALLATION

Install and update using pip:

```
pip install -U TLE-tools
```

CHAPTER

THREE

LINKS

- Website: https://federicostra.github.io/tletools
- Documentation: https://tletools.readthedocs.io
- Releases: https://pypi.org/project/TLE-tools
- Code: https://github.com/FedericoStra/tletools
- Issue tracker: https://github.com/FedericoStra/tletools/issues

CHAPTER

FOUR

INDICES AND TABLES

- genindex
- modindex
- search

4.1 API Documentation

If you are looking for information on a specific function, class, or method, this part of the documentation is for you.

4.1.1 API Documentation

This part of the documentation covers all the interfaces of `tletools`. For guides on how to use them, pleas consult the tutorials.

TLE Classes

Interoperability

Pandas

Poliastro

coming soon

Utils