Compliance sheet — star-stats

Everything a supplier qualification, a legal review or an export check usually asks about star-stats 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-STATS-EN · v2.3 · 2026-11-14
Package	star-stats
Version	0.1.0
Capability	star.statistics.exact-summary
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_stats

2. Licence and obligations

Apache License 2.0. You may use, copy, modify and distribute it, also commercially, and you receive a patent licence from the contributors. When you redistribute it: keep the LICENSE file and the copyright notices (and a NOTICE file, if a future version adds one), and state in modified files that you changed them. You may not use the S.T.A.R. name to endorse your product.

3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_stats-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_stats-0.1.0-py3-none-any.whl	d8c137e4b86d8a853989765e6081acbc90ac9ce42ed890d85fec532b465c3260
star_stats.py	cbad713fea7ac0eccf083983e327a045b06c966b1867b4eb91730b00172176e6
star_stats-0.1.0-source.zip	26841d1beebde37cb87767dfc8d4dd6e2a155cad57e30bc4f00ca36d326fa26b

5. What it does, and its limits

Mean, sample and population variance and standard deviation, root mean square and weighted mean computed exactly in rational arithmetic and rounded once, independent of the order of the values; on 500 datasets all seven statistics are identical to mpmath at 400 digits rounded once and to CPython's statistics module where it has them; reproduces the NIST NumAcc1 and NumAcc2 reference datasets.

"Exact" refers to the floats supplied: 0.1 is not one tenth, and the statistics of measurements carry the error of the measurements, which no arithmetic removes. On Python 3.12 the standard `statistics` module returns the same mean, variance and standard deviation: this package adds the root mean square, the exact weighted mean, the stated limits and refusals, and the independent check. Exact arithmetic is slower than floating point (about one second for 100000 values): it is for results that must not depend on rounding, not for large arrays. No medians, quantiles, covariance, regression or uncertainty of the estimates.

- `mean`, `variance`, `stdev`, `rms` and `weighted_mean` return the float nearest to the exact value of their formula applied to the numbers given (a float is an exact fraction). The result does not depend on the order of the values.
- `variance` and `stdev` are the sample statistics (divisor n - 1) by default and the population statistics with `sample=False`. Square roots are rounded correctly from the exact fraction, with no underflow or overflow of the squares.
- Measured on 500 datasets of 2 to 60 values (mixed magnitudes, large offsets, equal values, integers): all seven statistics are identical to mpmath at 400 digits rounded once, and to CPython's `statistics`

module where it has them; NumPy and SciPy differ by at most 5e-16 of the natural scale, which is their own rounding.

- Every function returns a float or raises `ValueError`: data that are not a list or tuple of 1 to 100000 finite numbers within 1e150 (booleans refused), a sample statistic of a single value, a `sample` that is not a bool, weights that are negative, all zero, not finite or of another length.

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_stats_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-stats}: Summary statistics, correctly rounded},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_stats/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

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