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Python Object Oriented Programming in Computational Orbital Mechanics

The Python programming language provides rich and streamlined object-oriented capabilities that facilitate the rapid development of scientific computing software. By encapsulating the Python rendition of the mathematical model of the entire solar system into a stand-alone class and coupling it with the Numpy and SciPy libraries, the resulting software generates the dynamic state of any number of celestial bodies rapidly and reliably. By structuring the entire Python software according to a traditional C++ paradigm, it becomes straightforward, after verification and validation, to generate a C++ version for compiled rapid execution.