Previous Next

9.3.3 Removing duplicate code in IVP solvers

MO2.4 MO2.7

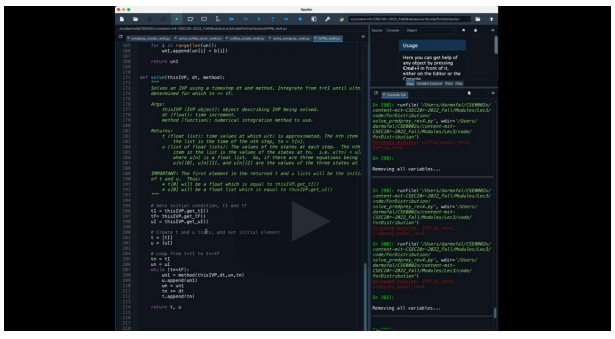
The implementations of Forward Euler in `IVPlib.FEsolve` and modified Euler in `IVPlib.RK2_MEsolve` have a large amount of duplicate code, specifically the portion of the codes that handles the initial condition and sets up the timestepping loop.

Code duplication is in general to be avoided as it requires the same code to be maintained in multiple places. For example, suppose a bug is found and fixed in the duplicate code, then everywhere that the code appears must also be fixed. Or, perhaps a new functionality is implemented in the duplicate code; yet again, in order for that new functionality to be available everywhere, it will have to be copied at every occurrence. As a result, we generally advocate avoiding code duplication.

For the `IVPlib` solvers, what we will do is create a general solver which performs the initialization and sets up the loop. And, within the loop, the general solver will call the specific timestepping method (i.e. Forward Euler, modified Euler, etc).

This restructuring of our solver implementation is described in the following video. The Python codes discussed in this video are available in the following zip file.

Video on reduced duplication IVP solver implementation



Start of transcript. Skip to the end.

Previous Next

Discussions

All posts sorted by recent activity

Refactored code doesn't seem to be available. No web

__kiwi__

2