IACS CS 207 Systems Development for Computational Science

Dunders and Operator Overloading on Time Series

This will be graded along with the rest of your codebase at the course Milestone 1.

Part 1: Add some more methods (issue #22: Laura)

Your `TimeSeries` class should be, by now, **a well documented, well tested, mutable, class which implements**:

- `__getitem__` : to get a value for a given index (should have done this)
- `__setitem__` : set the value for the given index (should have done this)
- `__contains__` : is a value in the values (NEW)
- `__iter__` : iterates over values. (This might have iterated over tuples of (time, value) pairs earlier (should have done this)
- `values` : returns a numpy array of values (should have done this)
- `itervalues` : returns an iterator over them (NEW)
- `times` : returns a numpy array of times (NEW)
- `itertimes` : returns an iterator over them (should have done this)
- `items` : returns a list of time-value tuple pairs (NEW)
- `iteritems` : returns an iterator over these (should have done this)
- `__len__` : returns a length. (should have done this)
- `__repr__` : abbreviating string representation (should have done this)

Part 2: Add to these methods(again well tested): #14 (Andrew)

- infix addition, subtraction, equality and multiplication. Here you must check that the lengths are equal and that the time domains are the same for the case of the operations on a TimeSeries (the latter implies the former). Return a `ValueError` in case this fails:

```
ValueError(str(self)+' and '+str(rhs)+' must have the same time points')
```

Let these be elementwise operations, as we might expect from a numpy array-like thing. As before, handle the case of a constant. - unary `__abs__` , `__bool__` , `__neg__` , and `__pos__` with the same semantics as the `Vector` class we saw in lecture.

A question that might arise is what to do if we add numpy arrays or regular python lists to a `Timeseries` . These should fail with `raise NotImplemented` as we dont have time associated. An option might have been to associate the array with the time indexing of the other array, but this is making too many assumptions: the user can do this explicitly.

You will probably have to catch another exception for this to happen.

Put this code into your project repo.