integrated python geoprocessing package (pygp)

Background and Motivation

Through work with both GIS Python and customized application development, Integrated Informatics has developed a specialized Python package to support multiple clients on multiple ArcGIS releases, Service Packs (9.2 to current), and Python (2.4 to current).

Integrated Python Geoprocessing

Because of this, pygp handles much of the heavy-lifting often placed on the developer. This is due to employment of multiple individual geoprocessing operations that have been combined into a larger, logical (frequently used) operations to make them easier to both understand and use.

- Support for multiple releases of ArcGIS (9.2 to current)
- Support for Python (2.4 to current)
- 15 multi-national companies and 3 provincial agencies
- 10 countries and supporting localizations
- 200+ professionals use pygp in daily workflow
- 12+ commercial products utilize the library
- 80% coverage in continuous integration testing
- 110k lines code/documentation (36k auto-generated)

Key Features

Multi-Version Support

pygp provides a framework for tools that allows them to continue to work when upgrading minor releases and major releases (9.x to 10.x).

Keyword Arguments

By utilizing positional and keyword arguments within the library, sensible defaults may be used more often. Additionally, much less typing is required for otherwise empty arguments.

Tool Nesting

pygp enables the ability to nest multiple geoprocessing tools that would typically require being run within a sequence. This nesting produces essentially a single line of code for complex processes, allowing the sequence to behave more like true Python functions.

Coordinate Systems

Since Spatial Reference objects are rich objects, they are easier to create, use, manipulate, retrieve, and compare by way of Integrated Python Geoprocessing.

Extended Data Elements

With the use of this package, Data Elements are treated as objects rather than exclusively as strings. This allows for the exposure of properties and methods on feature classes, rasters, datasets, tables, and virtually all other Data Elements associated with GIS.

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Cursors

Looping through the rows of a table requires a lot of repetitive code that is not particularly “Pythonic”. pygp cursors avoid this by making the cursors iterable and exposing them as methods on the extended data classes. These cursors also provide optional field and value validation.

Mapping

With pygp, Map Documents can now be treated in an object-oriented manner, allowing easier integration as well as extension and use within applications.