Imports, libraries, and modules

Friday, May 10, 2019 4:47 PM

"There's more than one way to do it."

"It is often possible to save a day of programming with an hour in the library."

The concept of a ***library***

- A library is Python code that is *contributed by others for your potential use.*
- Made available in your code via `import` statements.
- *Reusable* in a variety of programming situations.
- *Not part of Python.*
- Instead, *an extension* of what Python can do.

Libraries, modules, and content

- Libraries contain *classes* and *functions* for doing various things.
- Libraries can contain many of these.
- Thus, there is an intermediate level of organization called a *module*, that can contain several classes and/or functions.
- So *libraries contain modules that contain classes and functions.*

Some facts about libraries

- Just a normal python program.
- Objects can be imported from there.
- To import something, drop the .py from the filename.

For example, if `foo.py` contains

```
def bar():
   print("frodo lives!")
```

and you store that in the same directory as your notebook, then you can type

```
from foo import bar
bar()
```

with the expected result.

What libraries can contain

- Functions you might use.
- Classes you might use.

An example: the concept of a Frame.

- In data science, we often deal with things we call `Frames`.
- A `Frame` is a structure that represents a spreadsheet with headings.
- For various reasons, it is usually represented as a dict of lists, where each list is a column. E.g., we use:
  `{ 'pet': ['cats', 'dogs'], 'number':[10, 20] }`
  to represent the table or spreadsheet:

pet	number
cats	10
dogs	20

- Another representation of this same table is as a list of tuples, e.g., [('pet', 'number'), ('cats', 10), ('dogs',

20)]

- As you might expect, we commonly need to convert between these formats.
- What helps us is a class Frame, used as follows:

```
from Frame import Frame
data = [('pet', 'number'),
        ('cats', 10),
        ('dogs', 20)]
frame = Frame(data)
```

- In the exercise, we'll learn to understand, import, and use this library.

A quick afterword on completing this exercise:

- This may seem very, very complex but the key is to limit your scope to what is being discussed.
- It is very difficult -- and not important -- to keep all details in your head at once.
- Fortunately, you don't need to do that.

In dealing with any complex problem,

- Concentrate on one detail at a time.
- Print or `pprint` anything you don't understand.
- Proceed based upon what `pprint` tells you.