Variables in Python

Shankar Kulumani

Flight Dynamics & Control Lab

THE GEORGE WASHINGTON UNIVERSITY

WASHINGTON, DC

What is a variable?

- Assignment or placeholder in memory
- Variables have names
- Variables can be the basis of operations
- Variables can be assigned in the interpreter or a script file

frametitle

- Variables can be scalars or matrices

```
import numpy
a = 3.5
amatrix = numpy.array([[1, 2], [3, 4]])
```

Vectors

- Vectors can be 1 or 2 dimensional
- Best practice is to use 1 dimensional, Numpy will figure out the rest

```
import numpy
a = numpy.array([1, 2, 3])
b = numpy.array([[1, 2, 3]])
c = numpy.array([[1], [2], [3]])
```

Where do variables reside?

- Functions - visible inside the function
- Modules - entire module can access (and outside using `import`)
- Scripts/Interpreter - Only the script/interactive can view the variables

Naming

- Use variable names which actually match the data they hold
- Names are case sensitive
- One good approach is lowercase with underscores

Indexing in Python

- Arrays are zero based
- Can slice/view parts of a big array easily

```
import numpy
A = numpy.reshape(numpy.arange(25), (5, 5))
A[3, 4]
A[:, 1]
A[1:3,4]
A[2:, 0]
```

Indexing

- Find the size of an array

```
A.shape
numpy.shape(A)
```

- Modify items in an array with slicign

```
A[:,0] = [100, 200, 300, 400, 500]
```