

Before diving into Python for analyzing data or running Monte Carlos, it is necessary to understand some basic concepts about the core Python data types.

For example, the basic numeric type in MATLAB is an array (using double precision, which is useful for floating point mathematics), while the basic numeric data type in Python is a 1-dimensional scalar which may be either an integer or a double-precision floating point, depending on the formatting of the number when input.

0.1 3.1 Variable Names

Variable names can take many forms, although they can only contain numbers, letters (both upper and lower), and underscores (_).

They must begin with a letter or an underscore and are CaSe SeNsItIve. Additionally, some words are reserved in Python and so cannot be used for variable names (e.g. `import` or `for`). For example,

```
x = 1.0
X = 1.0
X1 = 1.0
X1 = 1.0
x1 = 1.0
dell = 1.0
dellreturns = 1.0
dellReturns = 1.0
_x = 1.0
x_ = 1.0
```

are all legal and distinct variable names. Note that names which begin or end with an underscore, while legal, are not normally used since by convention these convey special meaning.¹ Illegal names do not follow these rules.

```
>>> x = []
>>> type(x)
builtins.list
>>> x=[1,2,3,4]
>>> x
[1,2,3,4]
# 2-dimensional list (list of lists)
>>> x = [[1,2,3,4], [5,6,7,8]]
>>> x
[[1, 2, 3, 4], [5, 6, 7, 8]]
# Jagged list, not rectangular
>>> x = [[1,2,3,4] , [5,6,7]]
>>> x
[[1, 2, 3, 4], [5, 6, 7]]
# Mixed data types
>>> x = [1,1.0,1+0j,'one',None,True]
>>> x
[1, 1.0, (1+0j), 'one', None, True]
```