1 Creating Dates and Times

Dates are created using date by providing integer values for year, month and day and times are created using time using hours, minutes, seconds and microseconds.

Date and time manipulation is provided by a built-in Python module datetime. This chapter assumes that datetime has been imported using import datetime as dt.

```
>>> import datetime as dt

>>> yr, mo, dd = 2012, 12, 21

>>> dt.date(yr, mo, dd)
datetime.date(2012, 12, 21)

>>> hr, mm, ss, ms= 12, 21, 12, 21

>>> dt.time(hr, mm, ss, ms)
dt.time(12,21,12,21)
```

Dates created using date do not allow times, and dates which require a time stamp can be created using datetime, which combine the inputs from date and time, in the same order.

```
>>> dt.datetime(yr, mo, dd, hr, mm, ss, ms)
datetime.datetime(2012, 12, 21, 12, 21, 12, 21)
```

```
>>> datetime64('2013')
numpy.datetime64('2013')

>>> datetime64('201309')
numpy.datetime64('201309')

>>> datetime64('20130901')
numpy.datetime64('20130901')

>>> datetime64('20130901T12:
00') # Time
```

```
numpy.datetime64('20130901T12:
00+0100')

>>> datetime64('20130901T12:
00:01') # Seconds
numpy.datetime64('20130901T12:
00:01+0100')

>>> datetime64('20130901T12:
00:01.123456789') # Nanoseconds
numpy.datetime64('20130901T12:
00:01.123456789+0100')
```

Date or time units can be explicitly included as the second input. The final example shows that rounding can occur if the date input is not exactly representable using the date unit chosen.

```
>>> datetime64('20130101T00','
h')
numpy.datetime64('20130101T00:
00+0000','h')
>>> datetime64('20130101T00','
s')
numpy.datetime64('20130101T00:
00:00+0000')
>>> datetime64('20130101T00','
ms')
numpy.datetime64('20130101T00:
00:00.000+0000')
>>> datetime64('20130101','
W')
numpy.datetime64('20121227')
```

NumPy datetimes can also be initialized from arrays.

```
>>> dates = array(['20130901','
20130902'],
dtype='datetime64')
>>> dates
```

```
array(['20130901',
'20130902'],
dtype='datetime64[D]')
>>> dates[0]
numpy.datetime64('20130901')
```

MORE