1. *Effective Computation in Physics: Field Guide to Research with Python* (2015). Anthony Scopatz & Kathryn D. Huff. O'Reilly Media, Inc.
2. *Python for Everybody: Exploring Data Using Python 3* (2016). Charles R. Severance. PDF available
3. *Think Python: How to Think Like a Computer Scientist* (2012). Allen Downey. Green Tea Press. PDF available

Problems

1. Calculate some properties of a rectangular box that is 12.5"$\times$11"$\times$14" and weighs 31 lbs

   a. What is the volume of the box?

   b. What is the average density of the box?

   c. What is the result of the following logical operation, `volume>1000` (in inches^3)

In [70]:
```
volume = 12.5*11*14
print('a. The volume of the box is', volume, 'inches cubed')
density = 31/(volume)
print('b. The density of the box is', density, 'lbs/in^3')
result = volume>1000
print('c. The result is', result)
```

```
a. The volume of the box is 1925.0 inches cubed
b. The density of the box is 0.016103896103896103 lbs/in^3
c. The result is True
```

1. Use the variables given below, `str1` and `str2`, and check the following

   a. `str1<str2`

   b. `str1==str2`

   c. `str1>str2`

   d. How could you force (b) to be true? Hint or Hint

In [80]:
```
str1 = 'Python'
str2 = 'python'
a = str1<str2
print('a. ', a)
b = str1==str2
print('b. ', b)
c = str1>str2
print('c. ', c)
print('d. (b) can be made to be true by changing str2 from python to Python, or by chan
```

```
a.  True
b.  False
c.  False
```

```
d. (b) can be made to be true by changing str2 from python to Python, or by changing == to !=
```

1. The following code has an error, fix the error so that the correct result is returned:

```
y is 20 and x is less than y

x="1"
y=20

if x<y and y==20:
    print('y is 20 and x is less than y')
else:
    print('x is not less than y')
```

In [82]:
```
x = 1
y = 20

if x<y and y==20:
    print('y is 20 and x is less than y')
else:
    print('x is not less than y')

print('error was making x a string rather than integer')
```

```
y is 20 and x is less than y
error was making x a string rather than integer
```

1. Create a script that takes the clock hour in 24 hours and prints the clock hour with am or pm.

   Hint: Use an if-else statement with `print` commands

In [83]:
```
time = 22
if time > 12:
    print(time - 12, 'PM')
elif time < 12:
    print(time, 'AM')
```

```
10 PM
```

In [109…
```
time = 12
if time == 24:
    print(time - 12, 'AM')
elif time > 12:
    print(time - 12, 'PM')
elif time == 0:
    print(time + 12, 'AM')
elif time < 12:
    print(time, 'AM')
elif time == 12:
    print(time, 'PM')
```

```
12 PM
```

In [ ]: