# Guided Exercises

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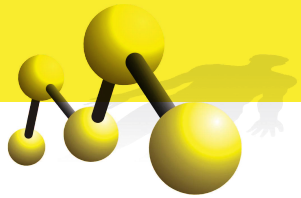
Programming for Scientists

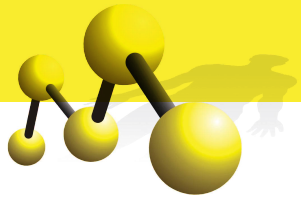
September 16, 2012

# Goals for this hour



- A quiz
- Do a few exercises.
- Play around.
- You can work alone, in pairs, in triples,...

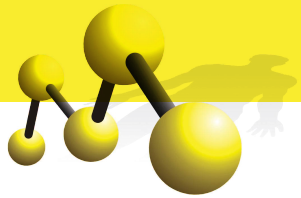
# Lists I



How do you access the first element of a list?
Assume list is a list:

1. list[1]
2. list[0]
3. list[-1]
4. list(0)
5. list(-1)
6. list(1)

# Lists II

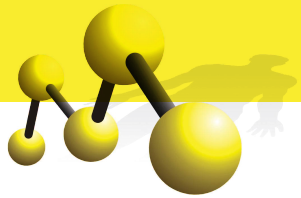


How do you access the last element of a list?
Assume list is a list:

1. list[1]
2. list(-0)
3. list[-1]
4. list(-1)
5. list(1)
6. list[-0]

# Exercises

# Object Identity



What is the difference between the following two code examples:
A)

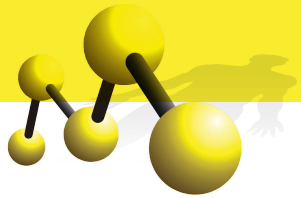
```
A = [1, 2, 3]
B = [1, 2, 3]
```

B)

```
A = [1, 2, 3]
B = A
```

Write a small piece of code (should be 2 or 3 lines) that behaves differently if you insert it after each of the two segments above.

# Object Identity



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B)

```
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B = A
```
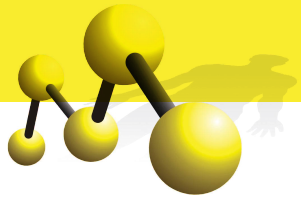

Write a small piece of code (should be 2 or 3 lines) that behaves differently if you insert it after each of the two segments above.

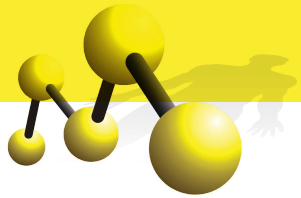
```
B[0] = 0
print A
```

# sum



1. Learn about the built-in function sum
2. Write an implementations of this function

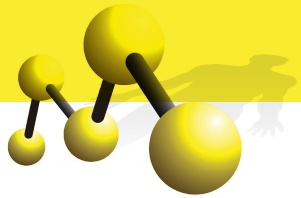
# sum



1. Learn about the built-in function sum
2. Write an implementations of this function

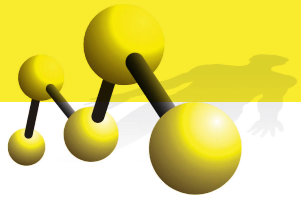
```
def sum(xs, start=0):
    '''
    s = sum(xs, start=0)

    Returns the sum of all values in ``xs`` + ``start`` (wh
    '''
    for x in xs:
        start += x
    return start
```

# Numpy



```
import numpy as np
```

# Matplotlib



```
import numpy as np
from matplotlib import pyplot as plt

X = np.linspace(-4, 4, 100)
Y = np.exp(.5-X*X)
```