Computational Basics

Lists
Objectives

- Apply the list data type as a container, including indexing.
- Employ for loops using lists as iterators.
Containers: lists
The list type represents an ordered collection of items.

Containers hold values of any type (doesn’t have to be the same).
We create a list as follows:
- opening bracket [
- one or more comma-separated data values
- closing bracket ]
lists work a bit like strings:

```python
x = [ 10, 3.14, "Ride" ]

print( x[1] )
print( x[1:3] )
print( len(x) )
```
Methods

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- Value is treated like an argument.
- Most (not all) RETURN their value.
We can change list content—they are mutable.

```python
x = [4, 1, 2, 3]
x[3] = -2  # sets an element
x.append(5)  # adds an element
del x[1]  # removes an element
x.sort()  # sorts in place
```
String Methods
String methods

- upper() convert to upper-case
- lower() convert to lower-case
- count(str1) count occurrences of str1
- replace(str2, str2) replace str1 by str2
- strip() remove whitespace at ends of string
These produce Boolean output.

- `isdigit()` Does a string contain only numbers?
- `isalpha()` Does a string contain only text?
- `islower()` Does a string contain only lower-case letters?
- `isupper()` Does a string contain only upper-case letters?
Example: String comparison methods

answer = input( 'How do you feel? ' )
if not answer.isalpha():
  print( "I don’t understand." )
else:
  print( "Ah, you feel %s." % answer )
Write a program for a user to create a new password. Certain rules should be applied.
if len( try ) < 8:
    # must be 8 characters at a minimum
    return False
if try.isupper() or try.islower():
    # must have both upper- and lower-case letters
    return False
if try.isalpha() or try.isdigit():
    # must have letters and numbers
    return False
# password is OK