Interactive Programs

Conditionals in Python

If Statement

Let's assume you want to write a program that: 1) asks a user to type his/her name, 2) checks if it is a known user, and 3) prints a welcome statement.

- we know how to do the first part:
  - known_users = [ 'Sandra', 'Markus' ]
  - name = raw_input( 'type your name: ' )
- We can check whether a person is in the list of known users:
  - name in known_users
- But how do we tell python to print a welcome message if the name is known?

Blocks and Indenting

Definition

In python, blocks are created by the use of a colon, followed by an indented section of text.

if <test>:
  do something
  do another thing
  a final thing
  do this regardless

Truth Values

- a test (in the if statement) corresponds to a yes/no question and can be either true or false
- the following values count as false:
  
    False
    None

- everything else counts as true!
Else Statements

- In case the program needs to do something when the test is false, use the else: statement
- E.g. if a user is not known, add him/her to the list

Example

```python
known_users = ['Sandra', 'Markus']
name = raw_input('type your name: ')
if name in known_users:
    print 'Hello ' + name + '. '
    print 'It is nice to have you back.'
else:
    known_users.append(name)
    print 'You have been added to the list.'
else:
    print 'You have been added to the list.'
```

Elif

- if you want to check the next condition in the else case, there is a shortcut for else if called elif

Example

```python
known_users = ['Sandra', 'Markus']
name = raw_input('type your name: ')
if name in known_users:
    print 'Hello ' + name + '. '
    print 'It is nice to have you back.'
elif len(name) > 20:
    print 'Your name is too long!'
else:
    known_users.append(name)
    print 'You have been added to the list.'
```

Nested Blocks

Example

```python
known_users = ['Sandra', 'Markus']
name = raw_input('type your name: ')
if name in known_users:
    print 'Hello ' + name + '. '
    if name.startswith('Dr. '):
        print 'Taking yourself seriously, Juhuh?'
    else:
        print 'You\'re my buddy.'
else:
    print 'You have been added to the list.'
```

More Tests

```python
x == y     x equals y
x < y      x is less than y
x > y      x is greater than y
x >= y     x is greater than or equal to y
x <= y     x is less than or equal to y
x != y     x is not equal to y
x is y     x is the same object as y
x is not y x is not the same object as y
in y       x is a member of y
not in y   x is not a member of y
```

Caution:
- = assigns a value
- == compares values
- Note: If you want to use an apostrophe in a string, you have to escape it with '\\'!
Booleans

Definition
You can combine conditions with `and` and `or`, and negate with `not`.

Example
```python
if 5 < x < 10 and x not in y:
    print('x is between 5 and 10')
    print('and is not in the list y')
```