

# Other uses for assertions

- Our unittest code uses `assert`.
- Assertions can also be used to state:
  - what we know is true (assuming our reasoning is correct) at a crucial point in the code.
  - what we assume is true at the start of a function or method.
- Syntax:  
`assert «condition», «error_string»`
- Meaning: If the condition fails,  
`raise AssertionError(«error_string»)`

# Assertions to state what we know

Example: what might we assert where?

```
if lnk.size > 0:
    prev_node = None
    cur_node = lnk.front
    while cur_node and not cur_node.value == v2:
        prev_node = cur_node
        cur_node = cur_node.nxt
```

# Assertions to check a type contract

Example: what might we assert where?

```
def list_between(node, start, end):  
    ''' (BTNode, object, object) -> list
```

```
    Return a Python list of all values in  
    the binary search tree rooted at node  
    that are between start and end  
    (inclusive).  
    '''
```

# Assertions help with bugs!

- An assertion can point out the existence of a bug even when there aren't other symptoms.
- And it can help locate the bug.
- Not just now, but *in the future*.
  - Someone may introduce a new bug when maintaining your code.

# Assertions communicate

- Assertions also communicate important facts about our code.
- You have done some reasoning to figure out what must be true at various points.
- If you write it down, this needn't be done again.
- ... unless the reasoning is wrong.
  - But if so, the assertion will alert you to that!

# Code Maintenance

- Both benefits of expressing assertions are particularly important during code maintenance.
- **Maintenance:** updates made after code is in use.
  - E.g., to add features, improve efficiency, port to a new version of the language/OS/etc.
- Maintenance may be done by:
  - Other people (and they can't read your mind)
  - You in the future (and you may forget)
- Maintenance can be the longest part of the lifetime of software.

## On the other hand ...

- Is there any downside to stating assertions?