Announcements

• Please do not post code to Piazza¹
• If your A1 is not perfect, your first grade will be a 1.
  • This is a counter for how many times you have submitted.
  • It is not a permanent grade, can resubmit until March 2nd,
• Review the announcements from the end of Lecture 6 for policies:
  http://www.cs.cornell.edu/courses/cs1110/2017sp/lectures/02-14-17/presentation-06.pdf
• Set your CMS notifications to get email when a grade is changed.
The first round of feedback should be out by Monday.
• Read section 2.3 of A1 carefully to understand how you can revise.

¹actually violating academic integrity rules because you are showing code to others

Methods: Functions Tied to Classes

• Method: function tied to object
  • Method call looks like a function call preceded by a variable name:
    \((\text{variable}).(\text{method})(\text{arguments}))\)
  • Example: \(p.\text{distanceTo}(q)\)
  • Example: \(p.\text{abs}()\) makes \(x,y,z \geq 0\)
• Just like we saw for strings
  • \(s = ‘abracadabra’\)
  • \(s.\text{index}('a')\)
• Are strings objects? Actually, yes. But this is not so important.

Name Resolution

• \((\text{object}).(\text{name})\) means
  • Go the folder for \(\text{object}\)
  • Look for attr/method \(\text{name}\)
  • If missing, check \(\text{class folder}\)
• Class folder is a \(\text{shared folder}\)
  • Only one for the whole class
  • Shared by all objects of class
  • Stores common features
  • Typically where methods are

Structure vs. Flow

Program Structure
• Order in which statements are written in scripts and modules
• Not necessarily the order in which Python executes them

Program Flow
• Order in which statements are actually executed at runtime
  • Statements may be:
    • skipped
    • executed more than once

Conditionals: If-Statements

Format

<table>
<thead>
<tr>
<th>if &lt;boolean-expression&gt;:</th>
<th># Put x in z if it is positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;statement&gt;</td>
<td>if (x &gt; 0): z = x</td>
</tr>
<tr>
<td>...</td>
<td></td>
</tr>
<tr>
<td>&lt;statement&gt;</td>
<td></td>
</tr>
</tbody>
</table>

Example

if \(\text{<Boolean expression>}\) is true, then execute all statements indented directly underneath (until first non-indented statement)
### Conditionals: If-Else-Statements

<table>
<thead>
<tr>
<th>Format</th>
<th>Example</th>
</tr>
</thead>
</table>
| if `<boolean-expression>`: `<statement>`... else: `<statement>`... | # Put max of x, y in z
if `x > y`:
| z = x |
| else: |
| z = y |

**Execution**

If `<Boolean expression>` is true, then execute statements indented under if, otherwise execute the statements indented under else.

### Conditionals: “Control Flow” Statements

If `b`:
- `s1` # statement
- `s3`

Else:
- `s2`
- `s3`

**Flow**

Program only takes one path each execution.

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### Program Flow vs. Local Variables

```python
def max(x,y):
    """Returns: max of x, y""
    # swap x, y
    # put the larger in y
    if x > y:
        temp = x
        x = y
        y = temp
    return y
```

- `temp` is needed for swap
- `x = y` loses value of `x`
- "Scratch computation"
- Primary role of local vars

### Program Flow and Testing

- Must understand which flow caused the error
- Unit test produces error
- Use print statements to examine program flow

```python
# Put max of x, y in z
print 'before if'
if x > y:
    print 'if x>y'
z = x
else:
    print 'else x<=y'
z = y
print 'after if'
```

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### Conditionals: If-Elif-Else-Statements

<table>
<thead>
<tr>
<th>Format</th>
<th>Example</th>
</tr>
</thead>
</table>
| if `<boolean-expression>`: `<statement>`... elif `<boolean-expression>`: `<statement>`... else: `<statement>`... | # Put max of x, y, z in w
if `x > y` and `x > z`:
| `w = x` |
eelif `y > z`:
| `w = y` |
else:
| `w = z` |