

Project #6  
CpSc 8270: Language Translation  
Computer Science Division, Clemson University  
Final Project: Python Functions & Scope  
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## Due Date:

In order to receive credit for this assignment, your submission must be submitted, using the `web handin` command, by 8 AM, Monday, December 5<sup>th</sup> of 2016. If you are unable to complete the project by the first due date, you may submit the project within three days after the due date with a ten point deduction.

## Project Specification:

1. Your solution should handle integer and float values and variables, `print`, `assignment`, and the same expressions as the previous project, including  $\{x + y, x - y, x * y, x / y, x // y, x \% y, x ** e, (x), -x, +x\}$ ; and,  $\{x+ = y, x- = y, x* = y, x/ = y, x// = y, x\% = y\}$ .
2. In addition, your solution should handle Python functions, illustrated in Figure 1. In particular, Figure 1a will earn 90%, Figures 1b, 1c, and 1d, will earn an additional 10% each, for a total of 120%.
3. In all cases, the oracle for correctness is a Python 2.7.n interpreter; that is, your expressions should evaluate, sans extended precision, to the same result that a Python 2.7.n interpreter would produce.
4. In the directory that contains your working interpreter, place a new directory titled `cases` that contains test cases that adequately test your interpreter.
5. Write a test harness, `test.py`, and place it in your project folder so that it runs the test cases in `cases`.
6. Your code should be well organized, formatted, readable, free of memory leaks, and exploit proper object orientation.

<pre>x = 7 def f():     x = 99     x += 1     print x  print x bam&gt; 7 f() bam&gt; 100</pre>	<pre>x = 7 def f():     x = 99     def g():         x += 1         print x     g()     f() bam&gt; 100 print x bam&gt; 7</pre>	<pre>x = 7 def f():     x = 99     x += 1     print x  print x bam&gt; 7 f() bam&gt; 100</pre>	<pre>x = 9 def f():     x = 17     print x     global x     x += 1 f() print x</pre>
(a) Basic Scope	(b) Nested Functions	(c) Return Statement	(d) Global Statement

Figure 1: Levels of Construction.