Wiki - Level 1 - Variables and assignments

Example: “my_name_is_variable”

Using only print statements, we can't form interesting computations. In Python, the assignment statement allows us to attach the value of an expression to a variable for later use in subsequent expressions. This statement will expand the range of possible Python programs to a much more interesting set of programs. To begin, consider the example “my_name_is_variable” at language level one.

```
# An assignment statement using a string
name = "Joe"
print "My name is", name
```

You can use the left and right arrows key to explore the structure of the assignment statement. Executing the assignment statement via “Step” causes the variable name to take on the value "Joe". *Pystep* visualizes this definition in the variable pane where the variable name is shown as having the value "Joe" of type string. Now, when an expression using a variable is encountered during subsequent evaluation, Python looks up the value of the variable and substitutes that value in place of the variable. The expression is then evaluated as usual. In the example, the instance of name in the print statement is replaced by its value "Joe" during one step of evaluation.

Examples: “fahrenheit_to_celsius”, “circle_area”, “triangle_area”

More generally, the right-hand side of an assignment statement can be an expression. Python evaluates the assignment statement by first evaluating its associated right-hand-side expression and then storing its value in the variable on the left-hand side. The third line in the next example “fahrenheit_to_celsius” illustrates this case when the right-hand side of an assignment statement contains a complex expression. Note that *Pystep* repeatedly reduces this expression to a simpler equivalent expression before assigning the resulting value to the variable celsius. The remaining examples include multiple variables and multiple assignments used to specify more complicated computations.

As a note, Python variable names consist of alphanumeric character and the underscore "_" character. Variable names must begin with an alphanumeric character. Also, observe that, for statements, the selection pane now has three instances, print, comment and assignment. Technically, comments are not statements in Python. (During stepping, *Pystep* ignores comments.) However, we have included them here for convenience to better illustrate the structure of a Python program.