

Introduction to PYTHON – Part 2

Python 015 – Variables I

Variables are temporary areas in memory that can be used to store data such as numbers or text (aka strings). Variables are not constant, and can be changed by the program.

To assign a value to a variable, the assignment operator ("=") is used, as in:

```
numCars = 7
```

In the example, the variable "numCars" contains the value 7, and is declared as a number. Compare this to:

```
numCars = "7"
```

...where numCars is declared as a string (note the quotation symbols). The differences between numbers and strings will become more apparent in future lessons.

Variables can contain characters, digits, or underscores, and should always be named something appropriate to make your program more "readable". A common practice is to use "[Camel Case](#)", and will be the practice used in this class. *Note: my own preference is to specifically use lower camel case, meaning that the first character is always lower case, as in "numCars" (as opposed to "NumCars").*

Variables are case-dependent, meaning that numcars is not the same as numCars.

Note that Python has a number of pre-defined keywords that cannot be used as variable names. These are: and, as, assert, break, class, continue, def, del, elif, else, except, exec, finally, for, from, global, if, import, in, is, lambda, not, or, pass, print, raise, return, try, while, with, and yield.

Assignment

Create a program that assigns the value 7 to a variable called "luckyNumber", then prints "The value of luckyNumber is <value of luckyNumber>".

Save as "015.py".

Python 016 – Variables II

Assignment

Modify program 015 so that it also prints the square of the number, the cube of the number, the square root of the number, and the number times 2.

Save as "016.py".

Python 017 – Variables III

Assignment

Modify program 015 so that the program prints "LuckyNumber + 2 = 9", where "9" is calculated by adding luckyNumber and 2.

Save as "017.py".

Python 018 – Keyboard Input I

The "input" command is used to input number from the keyboard and assign it to a variable, as in:

```
mark = input("What mark did you get?")
```

Optionally, you can print a statement and then wait for the keyboard input, as follows:

```
print "What mark did you get?"  
mark = input()
```

Note that the input command only works when inputting numbers. If you attempt to enter a string, Python will give you an error.

Here is an example that prompts for and prints your birth year:

```
print "What year were you born?"  
birthYear = input()  
print "You were born in", birthYear
```

Assignment

Write a program that prompts for your year of birth and the current year, then calculates and neatly outputs your age.

Save as "018.py".

Python 018a – Keyboard Input II

Recall that to enter a number from the keyboard you used a command similar to:

```
mark = input("What mark did you get?")
```

If you were to enter a string in response to the input command you would get an error. Instead, use the `raw_input()` command, as shown in this example:

```
name = raw_input("What is your name?")
```

In this case Python is expecting a string, not a number.

Assignment

Modify program 018 so it also prompts for and prints your birth location.

Save as "018a.py".

Python 019 – Variables I

Assignment

Create a program that assigns the value 3.1416 to a variable called "pi", then prints "The value of pi is <value of pi>".

Save as "019.py".

Python 019a – Variables II

Assignment

Write a program that uses two variables a and b with the values 3.56 and 5.67, respectively. Print the sum, the difference, the product, and the quotient of these numbers in the form "The difference of <a> and is <answer>".

Save as "019a.py".

Python 019b – Variables III

Assignment

Write a program that prompts for the radius of a circle then calculates and outputs the circumference.

Save as "019b.py".

Python 019c – Variables IV

Assignment

Write a program that prompts for time (in minutes) and distance travelled (in kilometres), then outputs the average speed (in km/h).

Save as "019c.py".

Python 019d – Variables V

Assignment

Write a program that prompts for two numbers, then divides the first by the second. Write the answer in the form "<a> divided by is <answer>."

Save as "019d.py".

Python 019e – Variables VI

Assignment

Rewrite program 019d, but this time use "// instead of the division ("/") operator. Run the program with different numbers to try to understand what is happening. See your instructor if you are not sure.

Enter what you think the purpose of this operator ("/") is in the program header.

Save as "019e.py".

Python 019f – Variables VII

Assignment

Write a program that prompts for your weight in kilograms, then outputs your equivalent weight in pounds.

Save as "019f.py".

Python 019g – Variables VIII

Assignment

Write a program that prompts for the length, width, and height of a box. Calculate and output the surface area and the volume.

Save as "019g.py".

Python 019h – Variables IX

Assignment

A piece of cake contains about 225 calories. Jogging one 1 km uses about 100 calories. Write a program that ask how many pieces of cake you have eaten and tells you how far you must jog to burn up the calories.

Save as "019h.py".