

Master of Engineering in Internetworking

Lab # 1

INWK 6312

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Start the Python interpreter and use it as a calculator. Python's syntax for math operations is almost the same as standard mathematical notation. For example, the symbols +, - and /denote addition, subtraction and division, as you would expect. The symbol for multiplication is *.

If you run a 10 kilometer race in 43 minutes 30 seconds, what is your average time per mile? What is your average speed in miles per hour? (Hint: there are 1.61 kilometers in a mile).

Assume that we execute the following assignment statements:

```
width = 17
height = 12.0
delimiter = '.'
```

For each of the following expressions, write the value of the expression and the type (of the value of the expression).

- 1. width/2
- 2. width/2.0
- 3. height/3
- **4.** 1 + 2 * 5
- 5. delimiter * 5

Practice using the Python interpreter as a calculator:

- 1. The volume of a sphere with radius r is $4/3 \pi r^3$. What is the volume of a sphere with radius 5? Hint: 392.7 is wrong!
- 2. Suppose the cover price of a book is \$24.95, but bookstores get a 40% discount. Shipping costs \$3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for 60 copies?
- 3. If I leave my house at 6:52 am and run 1 mile at an easy pace (8:15 per mile), then 3 miles at tempo (7:12 per mile) and 1 mile at easy pace again, what time do I get home for breakfast?

Python provides a built-in function called len that returns the length of a string, so the value of len('allen') is 5.

Write a function named right_justify that takes a string named s as a parameter and prints the string with enough leading spaces so that the last letter of the string is in column 70 of the display.

allen

A function object is a value you can assign to a variable or pass as an argument. For example, do_twice is a function that takes a function object as an argument and calls it twice:

```
def do_twice(f):
    f()
    f()
```

Here's an example that uses do_twice to call a function named print spam twice.

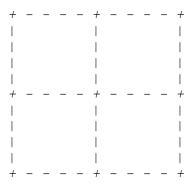
```
def print_spam():
    print 'spam'

do twice(print spam)
```

- 1. Type this example into a script and test it.
- 2. Modify do_twice so that it takes two arguments, a function object and a value, and calls the function twice, passing the value as an argument.
- 3. Write a more general version of print_spam, called print_twice, that takes a string as a parameter and prints it twice.
- 4. Use the modified version of do_twice to call print_twice twice, passing 'spam' as an argument.
- 5. Define a new function called do_four that takes a function object and a value and calls the function four times, passing the value as a parameter. There should be only two statements in the body of this function, not four.

This exercise can be done using only the statements and other features we have learned so far.

1. Write a function that draws a grid like the following:



Hint: to print more than one value on a line, you can print a comma-separated sequence:

```
print '+', '-'
```

If the sequence ends with a comma, Python leaves the line unfinished, so the value printed next appears on the same line.

```
print '+',
print '-'
```

The output of these statements is '+ -'.

A print statement all by itself ends the current line and goes to the next line.

2. Write a function that draws a similar grid with four rows and four columns.