Accelerated Programming 2

Python Tutorial Exercises

You should attempt these tutorial exercises *before* the AP2 tutorial session in the week concerned. Then you can contribute to the discussion during the tutorial session.

Sample solutions will be posted later at the AP2 Moodle site. *Attempt each exercise before consulting the sample solution.*

Exercises for Week 1

1A. *(Names)*

Which of the following are possible names for variables (or functions) in Python?

```
a    a1    1a    A123    and    second    2nd
day_time    over_the_moon    income_£    income_$
```

1B. *(Arithmetic expressions)*

Suppose that variable `m` contains 25, `n` contains 37, `x` contains 0.3, `y` contains 0.4, and `z` contains 0.5. Evaluate the following expressions:

(a) `m-n`

(b) `m**3`

(c) `-m`

(d) `n//10`

(e) `n%10`

(f) `(x+y+z)/2`

(*Note:* The operator "`**`" raises a number to a given power. The operator "`//`" divides two integers and yields their quotient, discarding any remainder. The operator "`%`" divides two integers and yields their remainder . The operator "`/`" divides two floating-point numbers.

1C. *(Assignment-statements)*

Trace the following sequence of assignment-statements:

```
p = 7
q = p+1
p = p+1
q = 2*q
```

showing the values contained in `p` and `q` after each statement.

1D. *(Built-in functions)*

Suppose that variable `x` contains 0.3 and `y` contains 0.4. Evaluate the following expressions:

(a) `abs(x-y)`

(b) `min(x,y)`

(c) `round(6*y)`

(d) `round(7*y)`

1E. *(Defining functions)*

Define functions to do the following:

(a) `double(n)` should return twice the integer `n`.

(b) `close(x,y)` should return True iff the floating-point numbers `x` and `y` differ by less than 0.5.

(c) `leap(y)` should return True iff `y` is a leap-year. Assume here that every multiple of 4 is a leap-year. (E.g., 1996, 2000, 2004, and 2008 were all leap-years.)

(d) Modify `leap(y)` to take account of the rule that a multiple of 100 is a leap-year only if it is also a multiple of 400. (E.g., 2000 was a leap-year, but 1800 and 1900 were not.)