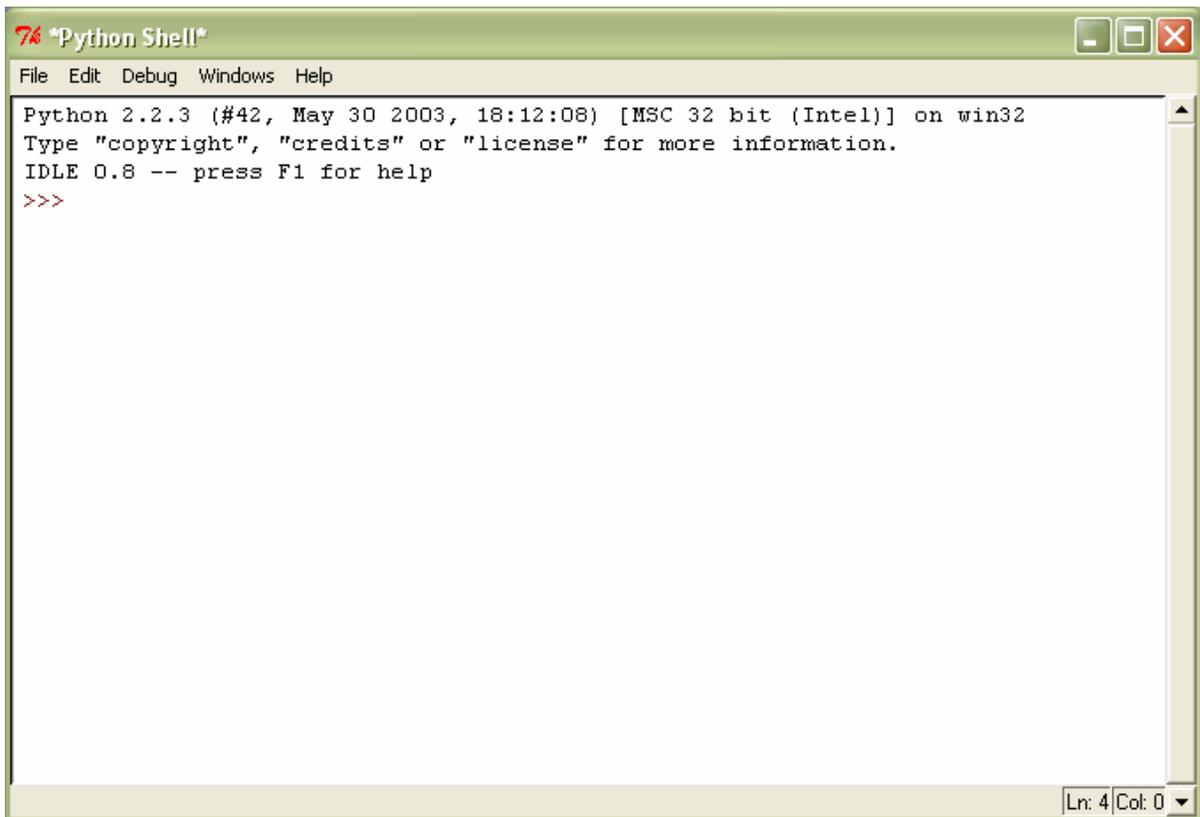# A201/A597 Introduction to Programming I

First Summer 2007

Lecture Two: Wednesday May 9, 2007 (Lindley Hall 102)

Today we start by exploring the world of Python.

We will be using IDLE:

Topics to be discussed in class today:

  a) numbers: with and without a fractional part
  b) expressions: numeric operators +, -, *, / and %
  c) strings and escape sequences
  d) variables and assignment statements
  e) type conversion
  f) getting user input
  g) running programs outside of IDLE

All of these can be found in the book in the first two chapters (pp. 1-50).

Lab Two: Wednesday May 9, 2007 (Education Building, room 2025)

Your lab assignment for yesterday was an Alice world for the Captive Queen problem.

Take your book to the lab, or use the on-line book in Books24x7 (the on-line library) and make sure you skim through chapters 1 and 2. Then write Python programs that solve the following 5 problems:

1. Write a program that produces this pattern:

```
    4
     4
      4
   4     4
   44444444
         4
         4
```

2. Do the same with a pattern made out of double quotes.

```
      "
       "
        "
     "     "
     """"""""
           "
           "
```

Note: for this problem please encode the whole pattern as one string, then print it (so the whole program is one long line). When this is done please consider other (simpler, better) ways for achieving the same result.

3. What would it take to write a program that produces this pattern:

```
        .8.            8 888888880            ,o8888880.
         .888.          8 8888    `88.        8888     `88.
          :88888.        8 8888     `88    ,8 8888       `8.
          . `88888.       8 8888     ,88    88 8888
         .8. `88888.      8 8888.   ,88'    88 8888
        .8`8. `88888.     8 8888888888      88 8888
       .8' `8. `88888.    8 8888    `88.    88 8888
      .8'    `8. `88888.   8 8888      88    `8 8888        .8'
     .888888888. `88888.  8 8888    ,88'       8888     ,88'
    .8'         `8. `88888.  8 888888888P         `8888888P'
```

4. Write a program that prompts the user for two integers and then prints

- The sum
- The difference
- The product

- The average
- The distance (absolute value of the difference)
- The maximum (the larger of the two)
- The minimum (the smaller of the two)

Here's how your program might work:

```
Please enter your first integer number: 3
Please enter your second integer number: 6
   3 + 6 = 9
   3 - 6 = -3
   3 * 6 = 18
   avg(3, 6) = 4.5
   dist(3, 6) = 3
   max(3, 6) = 6
   min(3, 6) = 3
```

Hint: use `abs(x)` which returns the absolute value of `x`.

5. Implement a program that directs a cashier how to give change.

The program has two inputs: a) the amount due and b) the amount received from the customer. Compute the difference, and determine the number of dollars, quarters, dimes, nickels, and pennies that the customer should receive in return.

Here's how your program might work:

```
Type the amount due: 3.72
Type the amount received: 5
Give 1.28 in change as follows:
   1 dollars
   1 quarters
   0 dimes
   0 nickels
   3 cents
```

Here's another example:

```
Type the amount due: 0.08
Type the amount received: 0.5
Give 0.42 in change as follows:
   0 dollars
   1 quarters
   1 dimes
   1 nickels
   2 cents
```