2. Example Problem
   a. Class of 12 students – Each shakes hand with everyone else
   b. How many handshakes are there?

Person #1 arrives	0 handshakes
Person # 2 arrives	1 handshake
Person # 3 arrives	2 handshakes
Person # 4 arrives	3 handshakes
…	
Person # 12 arrives	11 handshakes
	ADD These Up

For 12 people: 1 + 2 + … 11 = 66

In general, for X people, number of handshakes

1 + 2 + … + (X-1)

It is well known that

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

Can be easily verified, example with n = 10

1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10

	1	2	3	4	5	6	7	8	9	10
+	10	9	8	7	6	5	4	3	2	1
	11	11	11	11	11	11	11	11	11	11

Add up the sums. There are n terms, each one has value n+1

So, the sum = n(n+1).

But it is twice as big, so the original sum = n(n+1) / 2

Back to our original problem, with X people

$$Handshakes = 1 + 2 + \cdots + (X-1)$$

$$= \sum_{i=1}^{X-1} i$$

We know

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

Let n = X-1

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

$$\sum_{i=1}^{X-1} i = \frac{(X-1)(X-1+1)}{2}$$

$$= \frac{(X-1)(X)}{2}$$

$$= \frac{X(X-1)}{2}$$

So, for X people, the number of handshakes is given by

$$Handshakes = \frac{X(X-1)}{2}$$

Try it for X = 12 people:

$$Handshakes = \frac{12(12-1)}{2}$$

$$= \frac{12(11)}{2}$$

$$= 6(11)$$

$$= 66$$

Much more satisfying solution.

Generalizes to any number of people.

Section 1.5, Python Overview (Miller 3rd ed)

1. Programs:
    a. **Input** – Keyboard, mouse, controller, file, network, sensors, etc.
    b. **Process** – Logic that actually does something
    c. **Output** – Screen, controller (rumble), file, network, sound, etc.

2. Python Interpreter – Interactive Python Shell – Python Shell
    a. The ">>>" prompt
    b. R.E.P.L.
        - Read, Evaluate, Print, Loop

    c. Type one-line "Hello World" program
        - From Terminal
        - In IDLE
        - In Wing
            - Wing is an "IDE" – Integrated Development Environment

    d. Play around with the shell – If you mess up, who cares!

    e. Help System
        a. help(), opens in interactive mode. q to quit
        b. help(print)

3. Programs saved in a file – File should end in ".py"
    a. Write "Hello World" program and save it to file – 01-01-helloworld-1.py
        - In TextMate - Run from terminal
        - In Wing – Run from within IDE

    b. Show how to use main() function – 01-02-helloworld-1.py

    c. Show using Wing shell and file together – run file, call main()

4. Reading User Input
    a. Prompt for NAME – Print "Hello NAME" – 01-03-helloname.py