Introduction to:
Computers & Programming Exercises Using:
Variables and Functions

Adam Meyers

New York University

Exercise 1: Calculate an Average of 5 Numbers

- Use the function *input*
  - input(prompt)
    - displays prompt
    - waits for user to type something
    - returns whatever the user types as a string
- The program should allow the user to input 5 items
- At the end it should display the average

Problem 2: Calculate Birthday Biorhythms

- Go to http://en.wikipedia.org/wiki/Biorhythm
- Implement a function that given an age in number of days, would calculate and print one's biorhythms, i.e.,
  - def print_biorhythms(number_of_days): ...
- Write a function that calls print_biorhtyhms. It queries the user for their age and then gives them the biorythm for their next birthday (assuming no leap years).

Problem 3: Write a Mad Libs Program

- Mad Libs
  - A game in which a passage of text is assumed with various blanks that are typed by parts of speech: adverb, adjective, noun, verb, etc.
- We can create a program that plays this game interactively, prompting users to fill in these blanks
- Use the function *input again*
- Also use the / character to make multi-line commands

Mad Libs: Slide 2

- Choose a short self-contained text from the web, e.g., the first paragraph of Wikipedia's featured article of the day.
- Divide it into lines, with one print statement per line.
- Replace some of the words with variables indicating their part of speech.
- Precede print statements with queries to the user to set each of the variables.
- Encapsulate the above into an executable program.

Problem 4: Triangle Number

- Write a function that uses a loop to calculate the triangle number of any integer
- The triangle number of N is: the sum of all numbers start with 0 and ending in N.
- Use a loop, do not use the following shortcut:
  - triangle(N) = N*((N+1)/2)

Problem 5: Convert Number to Asterisk Number

- Replace each digit in a positive integer with that number of asterisks plus a space.
  - For example, convert 345 to the string

    '*** **** *****'

- Use type conversion, a for loop and the concatenation operator

Problem 6: Make a triangle out of asterisks

- The function should take one argument: a positive integer, lets call it “BASE”
- It should print:
  - 1 asterisk on the first line
  - 2 asterisks on the second line
  - …
  - BASE asterisks on the last line
- For example, make_asterisk_triangle(5) should print:

```
*
**
***
****
*****
```