Introduction to: Computers & Programming

Exercises Using: Variables and Functions

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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


• 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_biorhythms. It queries the user for their age and then gives them the biorhythm 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, let's 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:

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