Indian Institute of Information Technology Sricity, Chittoor

ITWS-2 (Python Programming)

Assignent-1

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1. Show the result of evaluating each expression. Be sure that the value is in the proper form to indicate its type (int, long int, or float). If the expression is illegal, explain why.

   (a) `4.0 / 10.0 + 3.5 * 2`

   (b) `10 % 4 + 6 / 2`

   (c) `abs(4 - 20 / 3) ** 3`

   (d) `sqrt(4.5 - 5.0) + 7 * 3`

   (e) `3 * 10 / 3 + 10 % 3`

   (f) `3L ** 3`

2. Show the list of numbers that would be generated by each of the following `range` expressions.

   (a) `range(5)`

   (b) `range(3, 10)`

   (c) `range(4, 13, 3)`

   (d) `range(15, 5, -2)`

   (e) `range(5, 3)`

3. Write a program to calculate the volume and surface area of a sphere from its radius, given as input. Here are some formulas that might be useful: $V = 4/3\pi r^3$ $A = 4\pi r^2$

4. Write a program that determines the molecular weight of a hydrocarbon based on the number of hydrogen, carbon, and oxygen atoms. You should use the following weights:

Atom	Weight (grams / mole)
H	1.0079
C	12.011
O	15.9994

5. Write a program to find the sum of the squares for the first n natural numbers.

6. Two points in a plane are specified using the coordinates (x1,y1) and (x2,y2). Write a program that calculates the slope of a line through two (non-vertical) points entered by the user. $m = \frac{y2-y1}{x2-x1}$

7. A certain CS professor gives 5-point quizzes that are graded on the scale 5-A, 4-B, 3-C, 2-D, 1-F, 0-F. Write a program that accepts a quiz score as an input and prints out the corresponding grade.

8. An acronym is a word formed by taking the first letters of the words in a phrase and making a word from them. For example, RAM is an acronym for "random access memory." Write a program that allows the user to type in a phrase and outputs the acronym for that phrase. Note: the acronym should be all uppercase, even if the words in the phrase are not capitalized.

9. Numerologists claim to be able to determine a person's character traits based on the "numeric value" of a name. The value of a name is determined by summing up the values of the letters of the name where 'a' is 1, 'b' is 2, 'c' is 3 etc., up to 'z' being 26. For example, the name "Zelle" would have the value $26 + 5 + 12 + 12 + 5 = 60$ (which happens to be a very auspicious number, by the way). Write a program that calculates the numeric value of a single name provided as input.

10. Expand your solution to the previous problem to allow the calculation of a complete name such as "John Marvin Zelle" or "John Jacob Jingleheimer Smith." The total value is just the sum of the numeric value for each name.