

Applied Coding - Language Skill (Expressions)

Solve the following problems using computer with help of Python/C++/Java/C# language as means of communication.

Problem 1: Mailing Address

Write a program that displays your name and complete mailing address. The address should be printed in the format that is normally used in the area where you live. Your program does not need to read any input from the user.

Problem 2: Hello

Write a program that asks the user to enter his or her name. The program should respond with a message that says hello to the user, using his or her name

Problem 3: Area of a Room

Write a program that asks the user to enter the width and length of a room. Once these values have been read, your program should compute and display the area of the room. The length and the width will be entered as floating-point numbers. Include units in your prompt and output message in either feet or meters, depending on which unit you are more comfortable working with.

Problem 4: Area of a Triangle

Write a program that computes the area of a triangle when the lengths of all three sides are known. Let s_1 , s_2 and s_3 be the lengths of the sides and let $s = (s_1 + s_2 + s_3)/2$. Then the area of the triangle can be calculated using the following formula:

$$\text{area} = \sqrt{s \times (s - s_1) \times (s - s_2) \times (s - s_3)}$$

Problem 5: Bottle Deposits

In many jurisdictions a small deposit is added to drink containers to encourage people to recycle them. In one particular jurisdiction, drink containers holding one liter or less have a \$0.10 deposit, and drink containers holding more than one liter have a \$0.25 deposit.

Write a program that reads the number of containers of each size from the user. Your program should continue by computing and displaying the refund that will be received for returning those containers. Format the output so that it includes a dollar sign and two digits to the right of the decimal point.

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Problem 6: Tax and Tip

The program that you create for this exercise will begin by reading the cost of a meal ordered at a restaurant from the user. Then your program will compute the tax and tip for the meal. Compute the tax as 18 percent of the meal amount. Compute the tip as 5 percent of the meal amount (without the tax). The output from your program should include the tax amount, the tip amount, and the grand total for the meal including both the tax and the tip. Format the output so that all of the values are displayed using two decimal places.

Problem 7: Sum of the First n Positive Integers

Write a program that reads a positive integer, n, from the user and then displays the sum of all of the integers from 1 to n. The sum of the first n positive integers can be computed using the formula:

$$\text{sum} = \frac{(n)(n + 1)}{2}$$

Problem 8: Compound Interest

Pretend that you have just opened a new savings account that earns 4 percent interest per year. The interest that you earn is paid at the end of the year, and is added to the balance of the savings account. Write a program that begins by reading the amount of money deposited into the account from the user. Then your program should compute and display the amount in the savings account after 1, 2, and 3 years. Display each amount so that it is rounded to 2 decimal places.

Problem 9: Distance Units

Write a program that begins by reading a measurement in feet from the user. Then your program should display the equivalent distance in inches, yards and miles. Use the Internet to look up the necessary conversion factors if you don't have them memorized.

Problem 10: Area and Volume

Write a program that begins by reading a radius, r, from the user. The program will continue by computing and displaying the area of a circle with radius r and the volume of a sphere with radius r.

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Problem 11: Free Fall

Write a program that determines how quickly an object is travelling when it hits the ground. The user will enter the height from which the object is dropped in meters (m). Because the object is dropped its initial speed, v_i , is 0 m/s. Assume that the acceleration

due to gravity is 9.8 m/s^2 . You can use the formula $v_f = \sqrt{v_i^2 + 2ad}$ to compute the final speed, v_f , when the initial speed, v_i , acceleration, a , and distance, d , are known.

Problem 12: Units of Time

Write a program that begins by reading a number of seconds from the user. Then your program should display the equivalent amount of time in the form D:HH:MM:SS, where D, HH, MM, and SS represent days, hours, minutes and seconds respectively. The hours, minutes and seconds should all be formatted so that they occupy exactly two digits. Use your research skills determine what additional character needs to be included in the format specifier so that leading zeros are used instead of leading spaces when a number is formatted to a particular width.

Problem 13: Sum of the Digits in an Integer

Write a program that reads a four-digit integer from the user and displays the sum of its digits. For example, if the user enters 3141 then your program should display $3+1+4+1=9$.