Computing Interest Using A Console Application and GUI

PART 1) of the assignment will compute interest using the console application, and PART 2) will create a graphic user interface (GUI) for the same problem. We will learn about how to do a GUI during prior to your having to do this problem.

1) Write a program that helps investors compute information about a given savings account.

a) Given an initial balance, \( P \), an interest rate, \( r \), and the number of years that the money is invested, \( t \), compute the total value of the account if the interest is compounded continuously.

The formula for this is:

\[
\text{total} = P \ e^{rt}
\]

where,
\( P \) = principal amount (initial investment)
\( r \) = annual interest rate (as a decimal)
\( t \) = number of years
\( \text{total} \) = total amount after time \( t \)

You can approximate \( e \) by declaring a constant double and setting it equal to 2.718281828459045

Have the main program prompt the user to input the variables, and call a value-returning function `computeTotal` that returns the final total value.

b) There are four variables in the equation above: \( \text{total}, P, r, \) and \( t \). Allow the user to put in ANY of the three variables, and compute and output the fourth. For example, the user might input a starting amount \( (P) \), ending amount \( (\text{total}) \) and years \( (t) \), and the program would output the interest rate\( (r) \) necessary to achieve that final amount.
One way of doing this (a very simple way) would be to instruct the user to enter 0 (ZERO) for the variable that is unknown. A more elegant approach would use a menu to allow the user to choose which variable would be unknown. Feel free to be creative in your approach.

c) Allow the user to choose one of two options: compounded continuously (as above) or compounded monthly. ( total = P \left(1 + \frac{r}{12}\right)^{12t} )