

## 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:

$$total = P e^{rt}$$

where,  $P$  = principal amount (initial investment)  
 $r$  = annual interest rate (as a decimal)  
 $t$  = number of years  
 $total$  = 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 :  $total$ ,  $P$ ,  $r$ , 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 ( $total$ ) 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. (  $total = P(1 + \frac{r}{12})^{12t}$  )