

## 01.2 - Interest

When a bank account pays compound interest, interest accrues not only on the principal amount that is deposited into the account, but also on the interest that has accumulated over time. Suppose you want to deposit some money into a savings account, and let the account earn compound interest for a certain number of years. The formula for calculating the balance of the account after a specified number of years is:

$$FV = P(1 + r/n)^{nt}.$$

In this formula,  $FV$  is the future value, in other words, the amount of money in the account after the specified number of years,  $P$  is the principal amount that was originally deposited into the account,  $r$  is the annual interest rate,  $n$  is the number of times per year that the interest is compounded, and  $t$  is the specified number of years.

Write a program that performs this calculation for you. The program should ask the user to input the following:

- the amount of principal originally deposited into the account
- the annual interest rate paid by the account, in percent
- the number of years the account will be left to earn interest
- the number of times per year that the interest is compound (For example, if interest is compounded monthly, enter 12. If interest is compound quarterly, enter 4.)

Note: The user should enter the interest rate as a percentage. For example, 2% would be entered as 2, not as .02. The program will then have to divide the input by 100 to move the decimal point to the correct position.

Once the input data has been entered, the program should calculate and display the amount of money that will be in the account after the specified number of years. The precision of output must be set to 2, the output must be formatted with comma separators and with the '\$' sign. For example, if the result of your program is 357689.237, then the output should be formatted as \$357,689.24.

Test your program with the following data:

Input				Output
$P$	$r$	$t$	$n$	$FV$
10000	7.9	40	12	\$233,277.53
80000	2.5	3.5	4	\$87,291.61
1234567	2.0	10	2	\$1,506,406.36

Finally, format your program to match the sample below. Your output should exactly match the sample output, character for character, including all white space and punctuation. User input in the sample has been highlighted in **Pappy's Purple** to distinguish it from the program's output, but your user input does not need to be colored. Save your finished program

as `interest_login.py`, where `login` is your Purdue login. Then submit it along with a screenshot showing a run of **all 3** test cases.

#### Terminal

```
$ python interest_login.py
Enter the following parameters.
  The initial deposit? 10000
  The annual interest rate in percent? 7.9
  The number of years the account earn interest? 40
  The number of times interest is compounded each year: 12
The balance of this account will be $233,277.53 after 40.0 years.
```