CPSC1012 Core Portfolio 1 – Arithmetic Expressions

Weight: 5% of your final mark

Compound Interest

You can compute the future value of an investment using the principal amount, the interest rate (in decimal), the number of years, and the number of times the interest is compounded per year. The following formula computes the future value:

$$futureValue = principalAmount * \left(1 + \frac{annualInterestRate}{compounds}\right)^{compounds*years}$$

where *compounds* can be monthly (12), quarterly (4), semi-annually (2) or yearly (1).

For example, if a customer invests $6,000 at an annual interest rate of 2.1% for a 5-year term that is compounded yearly (1) then the future value would be $6,657.02.

Create a new C# Console App project named as **CorePortfolio01-*YourFullName*** (eg: CorePortfolio01-CodeGuru) that makes the 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 (as a percentage of 100) paid by the account
- The number of times per year that the interest is compounded (12 for monthly, 4 for quarterly, 2 for semi-annually, or 1 for yearly)
- The number of years the account will be left to earn interest.

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.

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

Here is a sample run:

```
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| Compound Interest App |
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This program is used to calculate the future investment value.

Enter investment amount: 6000
Enter annual interest rate in percentage: 2.1
Compound periods can be 1 for yearly, 2 for semi-annually, 4 for quarterly, or 12 for monthly
Enter number of compound periods (1, 2, 4, 12): 1
Enter number of years: 5

Future value is $6,657.02
Investment amount:      $6,000
Annual Interest Rate:   2.1%
Compounds per year:     1
Years:                  5
```

Coding Requirements

The following coding standards must be followed when developing your program:

- A C# comment block at the beginning of the source file describing the **purpose**, **input**, **process**, **output, author, last modified date** of the program such as shown below:

```
/*
Purpose:            ____________________________________________________

Input:              ____________________________________________________

Process:            ____________________________________________________

Output:             ____________________________________________________

Author:             Your full name
Last modified:      yyyy.MM.dd
*/
```

- Write only one statement per line.
- Write only one declaration per line.
- Use camelCase for local variable names.
- Use PascalCase for constant variable names.
- If continuation lines are not indented automatically, indent them one tab stop (four spaces).

Submission Requirements

- Submit a compressed (zip) copy of your Visual Studio 2019 project folder to Moodle on or before the due date.

Marking Rubric

Mark	Description
5	Excellent – program passes all test cases and coding follows best practices and class standards
4	Very Good – program passes all test cases, but coding does not follow best practices and class standards
3	Acceptable – coded all the requirements and program produce the expected results for some of the test cases
2	Needs Work – coded all the requirements but program fails to produce expected results
1	Unsatisfactory – coded less than 50% of the requirements
0	Not done.