Lab05

IMPORTANT: While writing programs involving loops, sometimes you may accidentally write code that contains an *infinite loop*. An infinite loop will cause your display to freeze up or output continually to a text box, depending on what your loop contains. If this happens you can break out of the infinite loop and stop the run of the program by clicking the Stop icon (a red square to the right of the Play icon).

Part 1

Consider your fair coin flip python program from before.

   a. Modify it so it flips a FAIR coin 100 times each time reporting the number generated and whether it was "Head" or "Tail".
   b. Change your python program to report the number of generated "Head" and "Tail". Does it look like a fair coin?

D level — simple for loops that repeat a predefined number of times. Simple counting.

Part 2

Create a Raptor program that computes the total amount of interest earned on a savings account after a user specified number of years. Assuming that the interest is compounded annually, then the interest earned for a single year can be expressed as:

[1] $P \times R$,

where P is the principal amount, the amount in the savings account at the beginning of the year (note: this will change each year as interest is compounded), and R is the nominal interest rate.

   a. When done, convert your program to VB. Present the total amount of earned interest to the user using a MsgBox and in a sentence of the following form:

   ```
   After 10 years of compounding, your savings account with an initial balance
   of $500.00 and APR of 3%, will have earned a total of $XXX.XX in interest.
   ```

   In this example, `10 years`, `$500.00` and `3%` should be replaced with whatever values were input by the user.

C level — loops that repeat a user-defined (fixed) number of times.

Create a Raptor program that computes the numbers of years of compounding interest required to reach a target principal, given a starting principal and a nominal interest rate. Also output a table with the following information for each year.

The following is an example of how this problem will be formated.

Write a program that will compute and print out the information about the earnings on a savings account in table form, including the year, interest for that year, and the balance at the end of each year and the total interest earned during those years,

where the initial balance, `initialDeposit`, the annual interest rate, `interestRate`, and the number of years earning interest, `numberOfYears`, is obtained from the user via use of InputBox functions. Your output should look *exactly* like the table below. Assume the interest is compounded annually and that no withdrawals are made from this account. Include a button to cause the table to be created and displayed and also a quit button. For example, if `initialDeposit` was $500, `numberOfYears` was 10, and `interestRate` was 0.03, the following table would be printed.

NOTE: Remember to set the output text field's font to `Courier New` for your results to display correctly when using a format string.

```
 Your initial deposit in savings account is: $500.00
            Earnings Projections Table
year            interest earned (3.00%)         balance
*******************************************************
1                            $15.00             $515.00
2                            $15.45             $530.45
3                            $15.91             $546.36
4                            $16.39             $562.75
5                            $16.88             $579.64
6                            $17.39             $597.03
7                            $17.91             $614.94
8                            $18.45             $633.39
9                            $19.00             $652.39
10                           $19.57             $671.96
*******************************************************
The total interest earned is $171.96
```

B level — loops that repeat a data dependent (variable) number of times (Raptor only).

A level — loops that repeat a data dependent (variable) number of times (VB).