

CSCI-14 Assignment #3 (30 points), due 3/13/18

Say that you bought a car, and want to keep track of the remaining balance on your 9% loan for the car. You will make 36 monthly payments of \$165.25 each. You want to know the remaining balance you owe after each of the first three monthly payments. However, you want to get a general solution, not just one that will solve this particular loan.

The formula for the remaining balance after  $k$  payments is:

$$bal_k = pmt \left[ \frac{1 - (1 + i)^{k-n}}{i} \right]$$

where:

$bal_k$  is the balance remaining after the  $k^{\text{th}}$  payment,  
 $k$  is the payment number (1, 2, 3, ...),  
 $pmt$  is the amount of the monthly payment,  
 $i$  is the interest rate per month (annual rate / 12.0), and  
 $n$  is the total number of payments to be made.

You will need to use the function `pow()` in the math library. To get access to the math library in your program, `#include <cmath>`. To set a variable `y` to the value of  $x^p$ , use  
`y = pow( x, p );`

For example, to take 2.0 to the 5<sup>th</sup> power and put the result into `y`, write  
`y = pow( 2.0, 5.0 );`

You may use any double expression, variable or constant for the expressions (arguments) you pass into `pow()`.

Format your output using the input/output manipulators from `<iomanip>` as shown in `kilos.cpp` and the text (e.g., `showpoint`, `fixed` and `setprecision()`) to get balances in the format `$dddd.cc` (with as many digits for `ds` as needed) for dollars and cents. If the balance is less than \$1000, you may leave spaces after the dollar sign. Print the remaining balances after each of the first three payments. **Do not use a loop for this. Just calculate the balance three times.**

Test with the values I've given below, as well as several others of your own choosing. If you have a loan that you can test with, use it too.

For example, a test run could look like this (user entries in ***bold italic*** for reference only:

```
Enter payment amount : 165.35
Enter interest rate (9% as 0.09) : 0.09
Enter number of payments : 36
```

```
Payment entered was : $165.35
Interest rate is 0.09 which is 0.0075 per month
Number of payments is 36
Payment #1 leaves a balance of $5073.38
Payment #2 leaves a balance of $4946.08
Payment #3 leaves a balance of $4817.82
```