

CSCI-14 Assignment #2 (30 points) — due 2/16/12

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^{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 5th power and put the result into y , write

```
y = pow( 2.0, 5.0 );
```

To take the cube root of x and put it into y write:

```
y = pow( x, 1.0/3.0 );
```

You may use any float or double expression, variable or constant for either or both of the values (arguments) you give to `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 `d`'s (dollar) as needed) for dollars and cents. 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 above, 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