CSE 121 -- Introduction to "C" **Name:**_____

Programming Assignment #3 (p3.c) 20 Points

You're going to buy a house. You need to borrow $200,000 dollars. You want to get a feel for the relationship between the interest rate on the loan and how much "*Total_interest"* you will pay over the life-of-the-loan. You call your bank and ask, "If I borrow $200,000, what would the monthly payment be for a loan at 4%, 5% and 6%. The bank gives you the following payment information for 15 and 30 year loans:

15 year loan			**30 year loan**		
Interest Rate (given)	Payment/ month (given)	Total Interest (You calculate)	Interest Rate (given)	Payment/ month (given)	Total Interest (You calculate)
4%	$1,479.38		4%	$954.83	
5%	$1,581.59		5%	$1,073.64	
6%	$1,687.71		6%	$1,199.1	

Assume each month is of equal length. So for a 5% annual interest rate, the interest paid to the bank each month will be:

$$interest\_for\_this\_month = \left(\frac{5.0\%/100}{12}\right) \times loan\_balance\_during\_the\_month$$

total_interest = total_interest + interest_for_this_month

The new loan balance for the start of the next month will be calculated as:

*loan_balance = loan_balance - (*monthly_payment - *interest_for_this_month)*;

When the program begins running, have the program ask the user for each piece of necessary data, <u>for example</u>:

- How many years is your loan? (user inputs 30)
- Loan amount? (user inputs 200000) [don't use commas]
- Annual interest rate in percent? (user inputs 5 or 5.0)
- Monthly payment? (user enters 1073.64)

After all data has been entered, the program should run and display financial results for the end of ***<u>each month</u>***. The data to be shown are: The month, the interest paid for that month, the money leftover after subtracting that month's

interest from that month's payment, and finally the loan balance at the end of the month.

Then after the last payment is made (at the end of 15 yrs or 30 yrs), display the "total_interest" paid over the life of the loan (i.e. the *total_interest* paid over 15 or 30 years.)

See example output below.

Loan amount = 200000
Number of years = 30
Interest rate % = 6
Monthly payment = 1199.10

Below is output for the above parameters:

```
Month( 1) interest =1000.00, left_over_payment = 199.10,  balance = 199800.90
Month( 2) interest =999.00,  left_over_payment = 200.10,  balance = 199600.80
Month( 3) interest =998.00,  left_over_payment = 201.10,  balance = 199399.71
Month( 4) interest =997.00,  left_over_payment = 202.10,  balance = 199197.61
   :            :                   :                         :
   :            :                   :                         :
Month(359)  interest =11.91, left_over_payment = 1187.19,  balance =  1194.18
Month(360)  interest = 5.97, left_over_payment = 1193.13,  balance =     1.06

Total Interest =  231677.06, Final Balance =  1.06
```

Use the following command to submit your p3.c code

cp p3.c /home/faculty/skoss/cse121/your_UID

Also, fill in the table on the previous page, and hand in this paper on:
the following Monday.