course Project: part 1

**Instructions:**

Create the amortization table as indicated below.

Include brief, relevant comments in your code to explain the logic and to indicate the meaning of each variable that you create.

Do **NOT** use proc loan, functions mort, pmt and the like or arrays.

Be sure to round all values to proper dollar amounts (out to cents - hundreths decimal place)

Assume a fixed interest rate over the term of the loan and monthly payments.   
I know you are going to spend time on your favorite search engine looking for the answer. You may like to know that the code on the following two websites is useful, but neither site provides a complete, correct answer. Some of the information provided on these sites is helpful, however.   
<http://www.phdinfinance.org/how-to-create-a-loan-amortization-schedule-using-sas/>

<http://www.phdinfinance.org/time-value-of-money-payments-of-a-mortgage-loan/>

**Background:**

An amortization schedule is a table that lists the principal and interest charges, and the remaining balance for each payment across the life of a loan. Lenders use this type of schedule to determine monthly payments for most loans including mortgages. A portion of each payment is applied to the principal balance of the loan and the remainder of the payment goes toward interest. In the beginning of a loan, the interest portion of a payment is larger, and as the loan matures the portion allocated to the principal increases. The key formulas used to calculate an amortization schedule can be found easily on the Internet. Suppose that Isabel and Chris are very responsible first-time homebuyers. They have a down payment of $120,000 which is 20% of a $600,000 home that they hope will help them avoid private mortgage insurance (PMI). PMI is insurance to cover the lender in case the buyer is not able to repay the loan. With their down payment, Isabel and Chris have committed to stick to a sales price of $600,000 or less. They are working with a loan officer who has presented them with two different options. Plan A is that they borrow $480,000 on a 30-year fixed rate loan at an interest rate of 6%. Plan B is that they pay four points (4% of the loan) to get a lower interest rate, and then they roll the point amount into the loan amount. This means that they borrow $499,200 on a 30-year fixed rate loan to get a smaller interest rate of 5.5%. Isabel and Chris feel confused, so they call their parents and ask for advice.   
Note that the end balance for the last time point is most likely somewhat less than the regular payment. In this case, adjust the last payment accordingly.

1. Write a SAS program that uses a DATA step to create an amortization schedule for plans A and B. The program should create the following variables for each observation: time period (by month), beginning balance, payment amount, interest amount for that payment, principal for that payment, and the end balance.
2. **Extra Credit**

To make matters worse, their parents say that no matter what plan they choose they should add an additional $150 to their payment every month so that they can pay off their loan earlier. This gives Isabel and Chris two more scenarios. Plan C is that they borrow $480,000 on a 30-year fixed rate loan at an interest rate of 6%, and they add an additional $150 each month to their principal. Plan D is that they pay four points (4% of the loan) to get a lower interest rate of 5.5% rolling it into the loan amount totaling $499,200, and they add an additional $150 each month to their principal.

Create an amortization schedule for the $150 pre-payment plans C and D. Make sure that for each schedule only the time periods where there is an actual balance get output to the data set. In other words, scenarios C and D will allow them to pay the loan off sooner than 30 years, so only print the applicable time points. In this way, they will know how early the loan will be paid off. Also, throughout the schedule, the payment amount variable should include the $150 extra that they will be applying toward their principal balance.