Excel Finance
MAT 119 Instructor: M. Keindl
1. In this first exercise we will learn how to create an **amortization table** in Excel.
Suppose you want to buy a home for $200,000. You plan to make a down payment equal to 30% of the home's price. You will amortize the balance with a 10-year, fixed rate mortgage at a 7% annual interest rate, compounded monthly.
a) Open a new Excel Workbook and type House Price in A1, Down payment in B1, Loan amount in A3, Annual rate in B3, Periodic Rate in C3, Number of payment periods in D3, and Monthly Payment in A5.
b) Fill in the appropriate values in the second row. Use formulas whenever you can (i.e. For down payment use =A2*0.3 instead of entering the concrete value).
c) Fill in the appropriate values in the 4th row. Again use formulas whenever you can.
d) Use Excel's payment function to find the monthly payment amount in B5.

$$PMT(rate, nper, pv, fv, type)$$

$rate$ is the interest rate per payment period (we used i in class)
$nper$ is the total number of payment periods (we used n in class)
pv is the present value or loan amount
fv is the future value (since we are going to amortize the loan it is 0)
$type$ use 0 for ordinary annuity

Therefore in B5 type =PMT(C4,D4,A4,0,0), don't forget the '=' sign at the beginning
e) Type Payment number in A7, Monthly payment in B7, Interest paid in C7, Principal paid in D7, Loan balance in E7 and Equity in F7
f) Type 1 in A9. In A10, type =A9+1. Now highlight column A from A10 through and including A128. Go to the Edit menu and select Fill and then Down. The numbers 1 through 120 should appear in the Payment number column.
g) Type =-1*$B$5 in cell B9 (the $ keeps the cell constant). Highlight column B from B9 through and including B128. Fill down (ctrl-D).
h) In E8 type =A4. In C9, type =$C$4*E8. This will calculate the amount of interest that you will be paying. Highlight column C from C9 through C128. Fill down. It's ok that most of these cells have zeros in them for now.
i) In D9 type =B9-C9. This will calculate the portion of your payment that goes towards the principal. Highlight column D from D9 through D128. Fill down.
j) In E9, type =E8-D9. Highlight column E from E9 through E128 and fill down. This will give you the remaining balance on the loan after each payment.
k) In F9 type =$A$4-E9+$B$2 and fill down to F128. This will give you the equity amount on the house after each payment.
l) Determine the total amount of interest paid.
m) What if you pay a higher monthly payment? How long would it take to pay off the loan? To see, change B9 to a higher amount and fill down. Look for the month in which the Loan balance changes to 0 (or a negative number).
n) Determine the total amount of interest paid if you made the higher payment amount. How much would you save on interest?

2. Now use Excel to solve your WebWork problem #12.

3. Example to help with WebWork #15
A house that was bought 8 years ago for $150,000 is now worth $300,000. Originally, the house was financed by paying 20% down with the rest financed through a 25-year mortgage at 10.5% interest. The owner (after making 96 equal monthly payments) is in need of cash, and would like to refinance the house. The finance company is willing to loan 80% of the new value of the house amortized over 25 years with the same interest rate. How much will the owner receive after paying the balance of the original loan?

Solution:
Original loan amount$= 150,000 - (.20)150,000 = 120,000$

Original monthly payments$= V\dfrac{i}{1-(1+i)^{-n}} = 120000\dfrac{.00875}{1-(1+.00875)^{-300}} = 1133.02$

After making 96 payments the owner still owes 204 payments on the loan or

$$V = P\dfrac{1-(1+i)^{-n}}{i} = 1133.02\dfrac{1-(1+.00875)^{-204}}{.00875} = 107590.94$$

If the house is refinanced for 80% of $300,000 or (.80)300,000=240,000. After paying off the first loan, the owner will have $240,000-$107,590.94=$132,409.06.