**Learning Objective: Understand time value of money functions in Excel such as PV and PMT and be able to construct a loan amortization schedule using Excel.**

This homework will be completed in Excel. This homework has finance and excel learning objectives.

**Instructions for completion:**

Please use the Excel File named “Amortization\_Schedule (Template for HW 2) to complete an amortization schedule.

An input box appears in Cells B1 through C3. You may change these numbers as you test your model, but upon completion, please change back to the original inputs. In cell E3, compute (using the Excel function, “PMT”), the monthly payment on a loan. Make the inputs in the formula variable. That is, refer to the cells in the input box to build your formula such that if you change your inputs, the payment changes. Since FV and TYPE in the PMT function are both optional, ignore them. That is, do not put an entry in your formula for these. We know these are optional because of the brackets around then:

=PMT(rate,nper,PV,[FV],[Type])

So, you can just do the following:

=PMT(rate,nper,-PV)

Note: in order to have the PMT be positive, have PV be an outflow, by putting a negative sign in front of the PV.

Complete the “INFORMATION SHEET” (first worksheet in the file) by entering your name and GTID. Only enter your last name (family name).

When you complete your assignment, please save your file as follows:

HW\_2\_YOURLASTNAME

So, for me, it would be: HW\_2\_Garner.xlsm

SAVE AS A MACRO ENABLED FILE. This helps with grading. The file extension should be: .xlsm

**All work must be done individually. Do not share your files with other students.**

**Continued on next page**

**Instructions for Writing Formulas:**

**Any cell which is “filled” with a GRAY color must have a formula.**

The amortization schedule must accommodate any loan, up to 30 years (360 months), and the payments should be monthly.

“Fill” Cells A9 through A368 with numbers 1 through 360. These #s should be values, not formulas. You can use the “FILL” technique in Excel to help you. Once the numbers are in Cells A9 through A368, change their font color to white. Note, the numbers in column A refer to the month of the loan. Month 1, Month 2, etc.

In cells B9 through B368, write an IF statement formula that will “PULL” what is in column A if the loan includes that month. Example: In Cell A9, you will have the number “1.” In cell B9, there should be an if statement formula that checks if A9 is less than or equal to (Loan term \*12), where loan term is the term of the loan in years, which is in the input box in Cell C3. If the condition is true, the formula should “Pull” the month from column A; otherwise, we should have a blank, which is achieved with open quotes (“ ”).

In Cells C9 through C368, write an IF statement formula that will compute the PMT on the loan if the month in column B is less than or equal to (Term of loan \*12). Term of loan is in Cell C3. Otherwise, a blank should appear, which is achieved with open quotes (“ ”). Follow the instructions on page 1 about the optional portions of this function. Make sure that your PMT is positive, so make sure you input PV as an outflow. Refer to the input box cells in your formula. Pay special attention to relative and absolute references so you can copy your formulas down column C.

In Cells D9 through D368, write an If statement formula that will compute the interest portion of the payment on the loan if the month in column B is less than or equal to (Term of loan \*12). Term of loan is in Cell C3. Otherwise, a blank should appear, which is achieved with open quotes (“ ”). Interest is computed on the PRIOR monthly principal balance (Column F). You should use the interest rate in Cell C2, but you need to divide the annual rate in C2 by 12 so that it is a monthly rate. Pay special attention to relative and absolute references so you can copy your formulas down column D.

In Cells E9 through E368, write an If statement formula that will compute the principal portion of the payment on the loan if the month in column B is less than or equal to (Term of loan \*12). Term of loan is in Cell C3. Otherwise, a blank should appear, which is achieved with open quotes (“ ”). The principal portion of the payment is computed by subtracting the interest portion (Column D) from the PAYMENT portion (Column C).

Pay special attention to relative and absolute references so you can copy your formulas down column E.

In Cells F9 through F368, write an If statement formula that will compute the principal balance of the loan if the month in column B is less than or equal to (Term of loan \*12). Term of loan is in Cell C3. Otherwise, a blank should appear, which is achieved with open quotes (“ ”). The principal balance for any month is computed by subtracting the principal portion (Column E) from the prior month’s balance (Column F). Pay special attention to relative and absolute references so you can copy your formulas down column F.

In cells I20, I68, I128, and I248, create some “checks” to your model to ensure that your amortization schedule is correct. In column F, you have the principal balance computed via the use of amortization schedule. To ensure that your numbers are correct, please write formulas in these cells (I20, I68, I128 and I248) using the PV formula. The principal balance of any loan is simply the PV of the REMAINING payments. Write your formula as follows:

In order to have the formula return a positive value, place a negative sign in front of your formula:

=-PV(…….

In your formula, refer to the input box (Cells B1 through C3) and the cells in H1 through I6 to compute your formula. Example, if you have paid 12 payments, in a 30-year loan, 360 – 12 = 348 remain. So, the principal balance should be the PV of the remaining 348 payments. So, your formula should be:

=-PV(rate,nper,pmt,[fv])

Your rate should be pulling from the input box (make sure you make it monthly).NPER should be based on the original term in the input box less the appropriate checkpoint. NPER for the first checkpoint should be 30\*12 - 12, but do not hardcode these numbers; use the cells in the input box and the checkpoint box to obtain these #s. Note: You can hardcode the 12 which you multiply by the years.

Example: 30\*12 -12 = C3 x 12 – I3. The 12 here is “hardcoded.”

Pmt in the above formula should be referring to the payment computed in E3. Ignore FV since it is optional.

You are welcome to change #s in the input box to make sure your model is working, but when you turn it in, please have the numbers remain what they were when you originally opened the file:

Loan amount is $350,000; Rate is 4.375% (annual); Term of loan 30 (years)

**REMINDERS:**

Remember to fill out the information worksheet!

Remember to name your file as indicated on the first page of the instructions!

**END OF INSTRUCTIONS**