LOANSTAR AMORITIZATION MODEL
SYMPHONY VERSION
MAY 1, 1989
================================

Developed by:

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WELCOME TO THE *LOANSTAR* AMORTIZATION WORKSHEET

This is a macro-driven worksheet to develop both fixed and
adjustable rate loan amortization tables. Macros are used to
prompt you for the input data, generate the table, and print the
results. For information and help with this model, choose
"Help/Instructions" from the main menu, which is accessed by
pressing "Alt M".

If you have questions or comments, please feel free to contact us.

Bob O'Connor   (612) 557-6845
Jeff Junkermeier (612) 647-4745

This worksheet was developed and published by the individuals
listed above, who are members of the Twin Cities Lotus User Group
(TC-LUG) of Minneapolis and St Paul.

This model is copyrighted, shareware software. This means you
are free to try out the model to see if it meets your needs, and
to distribute it to others (subject to some restrictions) for the
same purpose. However, the program is NOT free, and you are
requested to become a registered user if you continue to use it
after an initial trial period.

For more information on this item, please see the Help/Instructions
section of this worksheet.

MACROS

==
copy this row of formulas to cell K16 if needed;

 #NAME?

copy this row of formulas to cell K17 if needed (fixed rate loans);

 #VALUE!

copy this row of formulas to cell K17 if needed (ARM loans);

 #VALUE!

MENU1

MENU_SAVE

MENU_INPUT

\0

\C

\H

\I

\M

Menu_Only

\P

\S

\V

ARMCHECK

Input_loop6

Input_loop7

Input_loop8

CALC_TABLE

Row#

CALC_TOTALS

CLEAR

Counter

COPY_FIXED

COPY_ARM

HLP_LOOP

Hlp_Scrn

Hlp_Cont

Key

INPUT

Input_loop1

Input_loop2

Input_loop3

Input_loop4

Input_loop5

MES_RESET

PRN_LOAN

SAVE_NO

SAVE_YES

Path_Name2
File_Name2

SET_WIDTH1

SET_WIDTH2

==
HELP/INSTRUCTIONS
==
Instructions: General~

There are a series of help/instruction screens below.

These cover the following topics:

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Press PgDn for more info or SPACEBAR to continue
Instructions: Overview/Introduction˜ (p 1)

This worksheet is designed for Lotus Symphony. While the various
formulas will also work in Lotus 123, the macros will not work. A
separate version of this model has been developed for Lotus 123,
version 2.0 or later and other compatible spreadsheets.

Although the model can be a very useful program, one of its main
purposes is to be a learning tool for various levels of users.
Some of the design features to accomplish this include the use of
range names in formulas, clearly written macro code with comments,
no hidden formulas or macros, no global protection, and the
development of these help screens.

In addition, we added features that are perhaps "overkill" for
this type of application, but help to illustrate advanced
techniques. For example, various messages are displayed during
macro execution that keep the user informed as to what the macros

Press PgDn for more info or SPACEBAR to continue
Instructions: Overview/Introduction˜ (p 1)

are doing or reinforce command line prompts for user input.

This model has some features that we believe are fairly unique, at
least among public domain and shareware programs for loan
amortizations:

☐-all the payments are dated so you can determine the status
     of the loan for any time period

☐-year-to-date interest paid is calculated based on the dates

⬜-the number of pages needed to print a table is automatically
     adjusted to match the number of payment months specified

⬜-the data input macros check for several errors and
     re-prompt the user to enter valid information

          Press PgDn for more info or SPACEBAR to continue
Instructions: Fixed vs Adjustable Rate Mortgages˜

The model allows you to generate a table with any reasonable
number of monthly payment periods. In addition, you may specify
either fixed rate or adjustable rate mortgages (ARMs).

ARMs allow the interest rate to fluctuate according to some
external index. Typically there will be a cap on the amount the
interest rate may change per adjustment, the maximum rate that may
be charged at any time, and how often the current rate will be
compared to the index (typically every 6 or 12 months).

If you specify an adjustable rate loan, you will be asked to
provide the 3 items described above. The model will then proceed
to calculate a "worst case" situation where the interest rate
increases as fast as allowed. Once the table is generated, you
may manually change the interest rates for any payment dates to
test alternative scenarios. Press F9 to recalculate the table.

  Press PgDn for more info or SPACEBAR to continue Instructions:
Instructions: Worksheet Organization˜

A1 ---------
| welcome
| screen &
| comments
A40 --------
|
|
| macros
|
|
A236 -------
|
| help
| &
|instructions
A500 -------

          Press PgDn for more info or SPACEBAR to continue
Instructions: Inputing Data˜

When you choose INPUT from the main menu, any previous entries will
be cleared, as will the previous table. After you enter your data,
the model will proceed to generate the loan table.

If you make a mistake entering the data, you may hear a beep and
be prompted to the re-enter that item. If the macros are unable
to detect the error, you must wait until the table has been
calculated. You may then revise the input information and press
the F9 key to recalculate the worksheet. However, the table
length will not be revised if you change the number of payment
months. For this you must again choose INPUT from the main menu.

Beginning with the second payment, the formulas in the payment and
interest columns refer to the previous month's result. Thus, you
may revise the payment or interest rate for any month in the table
and all the subsequent months will be changed after you press F9.

        Press PgDn for more info or SPACEBAR to continue
Instructions: Clearing the Table & Inputs˜

If for some reason you wish to save the model to a disk and you do
not need the current loan calculations, you should clear the table
before saving to disk. The CLEAR choice from the main menu allows
the template to save 123,000 bytes of storage compared to a 30 year
loan table.

As mentioned in a previous help screen, the table and input area is
automatically cleared when you select INPUT from the main menu.

        Press PgDn for more info or SPACEBAR to continue
Instructions: Saving the worksheet˜

This worksheet may be saved using the SAVE choice from the main
menu. The program will take you to the screen that you see at the
start of each session (with the "Welcome" message). You are then
given the opportunity to revise the file name and the path name
before saving. The "path name" is the directory location on the
fixed disk, or a floppy disk drive. Unlike the Symphony file save
command, you will not be prompted if the file name already exists.

If you save the worksheet without changing either the file or path
name, then the previous version of this file on the disk will be
overwritten by the current version. If you wish to save a
calculated table, revise the file name to create a new file and
thus preserve the original model intact.

Remember that no changes made or data added to the worksheet are
preserved until you save the worksheet to the disk.

       Press PgDn for more info or SPACEBAR to continue
Instructions: Printing the loan table˜

Select PRINT from the main menu to print the loan table. The
margins are set in the print settings sheet and are best for 12
cpi (characters per inch) type style. If you need to use 10 cpi
then go to the settings sheet and change the left margin to 0.

Note that the PRN_LOAN macro expands the columns to provide better
spacing on the printed page and then restores the previous widths
to allow all the columns of the table to be visible on the screen at
one time. If the macro is interrupted because of an error (such as
"printer not ready"), then the macro will not have had the
opportunity to reset the widths. However, the next time the print
routine is run it will restore the original column widths.

The model takes into account the number of payment months and
will print the table without wasting pages. A 36 month loan will
require one page; a 360 month loan will require 6 pages.

       Press PgDn for more info or SPACEBAR to continue
Instructions: Macros & program code˜

"Macros" refers to the program instructions and routines developed
by the authors to automate this model. These should only be revised
by someone familiar with the macro command language and this model.

The macros are all stored in columns A through H, starting in row
41. They are grouped by type (eg menu routines, alt macros, other
routines, etc) and organized alphabetically by range name. The
macro names are shown in capital letters in the column to the left
of the macro codes. Names for subroutines and storage cells within
the macros are shown using proper case format. Within the macro
code itself, all range names are shown in lower case format. Macro
keywords, @functions & Symphony commands are shown in capital letters.

To the right of the macro code is a column for comments to explain
what is happening. These may not be very detailed or complete.
Highlighted macro code lines would need to be revised for Lotus 123.

Press PgDn for more info or SPACEBAR to continue
Instructions: Correcting/Avoiding calculation errors˜

If the loan table shows "err" instead of results (and the input
area is not blank) then the top two rows of formulas may have
become damaged. These two rows of the loan table contain the
formulas that are crucial to the model. The formulas in the first
row reference the information in the input area. The second row
references numbers from the first row. It is the second row that is
copied down by the macros to create the rest of the table. A spare
copy of these two rows of formulas is stored at the top of the
macros section and you may copy them to the top of the table if you
need to.

To avoid errors or damage to the model, do not add or delete
columns or rows in the active area (approximately A1..Q500) of the
worksheet. Also, do not use the "move" command on any portion of
the loan table or input area.

Press PgDn for more info or SPACEBAR to continue
Instructions: Shortcuts & Misc˜

The choices from the main menu may be accessed directly by pressing
the key combinations shown below.

Alt I   Input   Input new data and calculate a new table
Alt P   Print   Print the loan table (be sure printer is ready).
Alt V   View   Return to the top of the loan table area
Alt H   Help   Access help and instructions for this model
Alt C   Clear   Clear the table calcs (before saving to a disk)
Alt S   Save   Save this worksheet to disk

The worksheet is set to manual recalculation to speed up data entry
and other operations. To recalculate after changes to data or
formulas press the CALC key, which is F8.

The ending balance for fixed rate loans may not be exactly $0.00
due to rounding of the formulas to 2 decimals (up to $0.005*months?)

Press PgDn for more info or SPACEBAR to continue
Instructions: Comments on formulas˜

The formula to calculate the payment dates is especially
interesting. It was published in the public domain several years
ago, but relatively few seem to be aware of it. It can take any
date and give the corresponding day in the following month. This is
especially difficult for dates that occur after the 28th of the
month. For example, a date of Jan 31, 1988 would convert to Feb 29,

1988 then Mar 31, then Apr 30, etc. In 1989, the latest date in Feb would be the 28th.

The formulas in the top row of the loan table are also interesting in that they illustrate the usefulness of range names to help interpret a formula (compare them to the second row). In addition, they illustrate the use of absolute references (compare them to the spare formulas at the top of the macro section).

        Press PgDn for more info or SPACEBAR to continue
Instructions: Registration and distribution˜ (p 1)

The worksheet may be copied, distributed, and used subject to the following conditions:

    -no changes may be made and distributed to others
      without our written consent;

    -no fees may be charged other than for copying, shipping
      and handling, not to exceed $10.00;

    -persons who continue to use the model after an initial
      trial period are requested to become registered users;

    -members of the Twin Cities Lotus User Group (TC-LUG) are
      automatically granted status as registered users;

    -the registration fee is $20.00 payable as shown below:

        Press PgDn for more info or SPACEBAR to continue
Instructions: Registration and distribution˜ (p 2)

        REGISTRATION FORM: *LOANSTAR* AMORTIZATION WORKSHEET
        ==
              Model Date: May 1, 1989

Name: _____   _____ Quantity

Organization: _____□   x $20.00 Fee
                              ======
Street: _____
                        = $ _____   Total Due
City: _____ State: __ Zip: _____

Spreadsheet: _____
(123, Symphony, etc.)

Press SPACEBAR to continue

saving file; please wait . . .
==

Press "PgDn" For Additional Comments

Press "PgDn" To View The Macros
Press "Alt M" To Access Main Menu
==

#NAME?

0.00
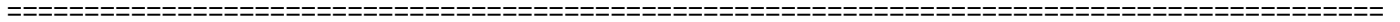
#NAME?
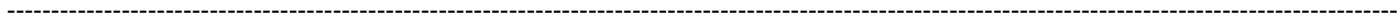
Quit
Leave this menu and return to "ready" mode
{QUIT}

No
Save the file using the file and path names shown?
{BRANCH save_no}

Adjustable Rate Mortgage
To input information for an Adjustable Rate Mortgage.
{copy_arm}
{BRANCH input}

{HOME}{GOTO}notes~
{BRANCH mes_reset}

{clear}
{BRANCH mes_reset}

{LET hlp_scrn,"instr_gen"}
{hlp_loop}

{HOME}{GOTO}loans~{MENUBRANCH menu_input}

{LET message,"select an option from the menu choices above"}
{LET message2,"select an option from the menu choices above"}~
{MENUBRANCH menu1}
{BRANCH mes_reset}

{BRANCH prn_loan}

{HOME}{GOTO}file_name~
{LET message,"press y or n . . ."}~
{MENUBRANCH menu_save}

{HOME}{GOTO}loans~
{BRANCH mes_reset}

{IF @CELL("TYPE",copy_block)="b"}{RETURN}
{GOTO}lifecap~
{GETNUMBER "Enter in the Lifetime Interest Rate Cap: ",lifecap}
{IF lifecap<1}{BEEP}{BEEP}{BRANCH input_loop6}
{IF lifecap<@ROUND(int_rate*100,3)}{BEEP}{BEEP}{BRANCH input_loop6}
{LET lifecap,lifecap/100}{IF @ISERR(lifecap)}{BEEP}{BEEP}{BRANCH input_loop6}
{DOWN}
{GETNUMBER "Enter in the Periodic Interest Rate Cap: ",adj_cap}
{IF adj_cap<1}{BEEP}{BEEP}{BRANCH input_loop7}
{LET adj_cap,adj_cap/100}{IF @ISERR(adj_cap)}{BEEP}{BEEP}{BRANCH input_loop7}
{DOWN 2}

```
{GETNUMBER "Enter in the number of months per Adjustment Period: ",adj_period}
{IF @ISERR(adj_period)}{BEEP}{BEEP}{BRANCH input_loop8}
```

```
-------------------------------------------------------------------------------------------------------------------------------------
  LIFETIME CAP:
  ADJUSTMENT CAP:
  MONTHS PER
   ADJUSTMENT PERIOD:
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```

```
{LET message2,"calculating the loan table; please wait . . ."}~
{WINDOWSOFF}
{LET row#,@STRING(+months+@cell("row",tbl_loan)-3,0)}
/Cformulas~k18..k
27
~{BRANCH calc_totals}

{GOTO}formulas~
{RIGHT}{END}{DOWN 2}
/RNCtotals~~
/RNDtotals~
/RNCtotals~
{LEFT}.{RIGHT 5}{DOWN}~
@REPEAT("-",@CELL("width",!{UP})-1)~
/C~{RIGHT 2}.{RIGHT}~
/RV{RIGHT 3}~~
/RLR{RIGHT 3}~~
{DOWN}
@SUM({UP 2}.{END}{UP})~
/FP~~
/C~{RIGHT 2}.{RIGHT}~
{CALC}{HOME}{GOTO}
loans~
{LET message,"press Alt M to access main menu"}
{LET message2,"Your Table is Ready  (press Alt M to access main menu)"}~
{WINDOWSON}{BEEP 3}{BEEP}

{LET message,"clearing the previous inputs and calc's; please wait . . ."}
{LET message2,"clearing the previous inputs and calc's; please wait . . ."}~
{HOME}{GOTO}
loans~
{GOTO}input_area~
{BLANK input_area}
{BLANK tbl_loan}
{MENU}FRtbl_loan~
{CALC}{mes_reset}
```

1

```
{BLANK copy_block}
/Cfrmlas_fixed~formulas~

/Cblock_#1~copy_block~
/Cfrmlas_arm~formulas~


{WINDOWSOFF}{HOME}
{GOTO}
instr_gen
~{LEFT}{RIGHT}{WINDOWSON}{LET COUNTER,1}
{GET key}
{IF key="{BIGDOWN}"#AND#counter<15}{BIGDOWN}{LET counter,counter+1}{BRANCH hlp_cont}
{IF key="{BIGUP}"#AND#counter>1}{BIGUP}{LET counter,counter-1}{BRANCH hlp_cont}
{IF key="Q"}{QUIT}
{IF key<>" "}{BEEP}{BRANCH hlp_cont}
{HOME}{GOTO}notes~

q

{clear}
{LET message2,"enter the information requested above"}~
{GETNUMBER "Enter starting loan balance (do not add comma's): ",start_bal}
{IF @iserr(start_bal)}{BEEP}{BEEP}{BRANCH input_loop1}
{DOWN}
{GETNUMBER "Enter the annual interest rate (example: use 10.5 not .105): ",int_rate}
{IF int_rate<1}{BEEP}{BEEP}{BRANCH input_loop2}
{LET int_rate,int_rate/100}
{IF @ISERR(int_rate)}{BEEP}{BEEP}{BRANCH input_loop2}
{DOWN}
{GETNUMBER "Enter the loan term in months: ",months}
{IF @ISERR(months)}{BEEP}{BEEP}{BRANCH input_loop3}
{DOWN}
{GETNUMBER "Enter the monthly payment if known or press enter: ",payment}
{IF @ISERR(payment)}{LET payment,"@ROUND(@PMT(start_bal,int_rate/12,months),2)"}{EDIT}{HOME}{DELETE}
{DOWN}
{GETLABEL "Enter the date of the first payment (mm/dd/yy): ",pmt_date}
{IF @ISERR(@DATEVALUE(pmt_date))}{BEEP}{BEEP}{BRANCH input_loop5}
/RLRpmt_date~
{armcheck}
{CALC}
{BRANCH calc_table}

{LET message,"press Alt M to access main menu"}
{LET message2,"press Alt M to access main menu"}~

{LET message2,"printing the loan table; please wait..."}~
{HOME}{GOTO}
```

```
loans~
{set_width1}
{GOTO}tbl_loan~{UP 2}
{SERVICES}PSONSR
heading~
QAGSSR{BS}{TAB}
{RIGHT 6}{END}{DOWN 3}~
OTtop_labels~QGPQ
{set_width2}
{BRANCH mes_reset}

{LET message,"revise file and path names and press Alt S"}~
{QUIT}

{LET message,"saving file; please wait . . ."}~
{LET file_name2,file_name}
{LET path_name2,path_name}
{SERVICES}FS{ESC}
b:\
LOANSTAR.WR1
~Y{ESC}
{BRANCH mes_reset}

{WINDOWSOFF}
/WS12~{RIGHT}
/WS13~{RIGHT}
/WS9~{RIGHT}
/WS13~{RIGHT}
/WS13~{RIGHT}
/WS12~{RIGHT}
/WS12~{LEFT 6}
{WINDOWSON}

{WINDOWSOFF}
/WS12~{RIGHT}
/WS11~{RIGHT}
/WS7~{RIGHT}
/WS11~{RIGHT}
/WS11~{RIGHT}
/WS10~{RIGHT}
/WS10~{LEFT 6}
{WINDOWSON}
```

Overview/Introduction
Fixed vs Adjustable Rate Mortgages (ARMs)
Worksheet organization
Inputing data
Clearing the table & inputs
Saving the worksheet
Printing the loan table
Macros & program code
Correcting/Avoiding calculation errors
Shortcuts & Misc
Comments on formulas
Registration & distribution of the model

```
I1 ------------
|  input area
| -------------
|
|  loan table
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=== ===================================

=== ===================================

#NAME?	#NAME?
0.000%	0.00
#NAME?	#NAME?

-- --

Input   Print
Input new data and calculate a new table   Print the loan table (be sure printer is ready).
{HOME}{GOTO}loans~{MENUBRANCH menu_input}   {BRANCH \p}

Yes
Save the file using the file and path names shown?
{BRANCH save_yes}

Fixed Rate Mortgage
To input information for a Fixed Rate Mortgage.
{copy_fixed}
{BRANCH input}

Block_#1

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P1
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P12
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Send to:

Sheet1

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Copyright by:

===

#NAME?

0.00

#NAME?

View
Return to the top of the loan table area without clearing previous calcs
{BRANCH \v}

The diagram at left gives a
basic idea as to how the
worksheet is organized. It is
not drawn to scale, and the row
numbers may not be exactly
correct if revisions have been
made to other parts of the
model since this map was
created.

==

R. M. O'Connor & Associates
5490 Balsam Lane
Plymouth, Mn, 55442

==

#NAME?

0.00

#NAME?

Help/Instructions
Access help and instructions for this model
{BRANCH \h}

confirms that the user wants to use the file and path names shown

allows either fixed or adjustable rate loans

run the appropriate sub routine
continue with the input routine

auto executing when wks loaded

runs the "Clear" routine

ACCESS HELP SYSTEM
control user's keystrokes

runs the "Input" routine

ACCESS MAIN MENU

display main menu
reset message for Alt M

runs the "Print" routine

ACCESS FILE SAVE ROUTINE
reset message to user
display save option menu

sets cursor to view input area and top of table

INPUTS FOR ADJUSTABLE RATE LOANS

check for incorrect entry
check for incorrect entry
convert the interest rate to percent

check for incorrect entry
convert the interest rate to percent

check for incorrect entry

used for entry of ARM info

GENERATES THE LOAN TABLE

determines the bottom row# fot the table formulas
copies formulas from row 17 to rest of tbl
bottom row # for the table
run the next subroutine

CREATE SUM FORMULAS BELOW TBL

klutsy but safe way to create a range name

enters dashed line at bottom of tbl columns that is one character less than the width of the column

enters @sum formulas below selected tbl columns
formats the formula for punctuated style

reposition cursor

CLEAR THE INPUTS & TABLE

reposition cursor

reset cell formats
recalc the remaining top two rows of table

used to keep within help screen area

setup input area for fixed rate loan

setup input area for ARM

HELP KEYSTROKE MONITOR

changes to various screens

loop to monitor keystrokes
allow page down key to bottom of help area, 15 screens
allow page up key to top of help area
allow Q to quit
only accept spacebar

stores keystrokes for help routine

run the "clear" routine and return

prompt user for info
check for incorrect entry

prompt user for info
check for incorrect entry
convert interest into %
check for incorrect entry

prompt user for info
check for incorrect entry

prompt user for info
accepts user's pmt or calculates it

prompt user for info
check for incorrect entry
right aligns the date label for appearances
check if inputs needed for ARM
recalcs the first few rows of formulas
run the next routine

resets the message lines to prompt user to use Alt M

PRINT THE LOAN TABLE

run routine to expand column widths
reposition cursor
clear old settings, then set top info for printing
range name for input info printed at top of 1st page
print the top few rows (input area), then reset the print range
define the loan table to be the new print range
set the column headings to be the top labels for each page & print
run routine to restore column widths

cancel file save routine

FILE SAVE ROUTINE
pulls info from cells H1 and H2

clears the previous file and path from command line

replace if existing, escape if the R is not needed because file is not replacing...

EXPAND TBL COLUMN WIDTHS

RESTORE TBL COLUMN WIDTHS

R. M. O'Connor & Associates
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Plymouth, Mn, 55442

LOANSTAR.WR1
b:\

==

==

#NAME?

#VALUE!

#VALUE!

Clear
Clear the table calculations (recommended before saving model to a disk)
{clear}

Save
Save this worksheet using the file name and directory in cells H1 and H2
{BRANCH \s}

Sheet1

press Alt M to access main menu
========================= ========================== ========
#NAME?

STARTING BALANCE:
ANNUAL INTEREST RATE:
TERM IN MONTHS:
MONTHLY PAYMENT AMOUNT:
DATE 1st PMT (mm/dd/yy):

PAYMENT DATE	PMT AMOUNT	INT RATE
==========	=========	======
#NAME?	#NAME?	#NAME?
#NAME?	#NAME?	#NAME?

============================ ========== ========== ===========
 LOAN AMORTIZATION SCHEDULE

INTEREST PAID	PRINCIPAL PAID	BALANCE	YR-TO-DATE INTEREST
#NAME?	#NAME?	#NAME?	#NAME?
#NAME?	#NAME?	#NAME?	#NAME?