

TK Solver Case Study: Creating Summary Tables

The TK Solver variable sheet provides a concise summary of the inputs and outputs of a mathematical model. However, if several different scenarios are run, the variable sheet can only store one at a time. Fortunately, TK tables can be set up and the solutions transferred directly as needed.

We will use as our example the Mortgage Calculation model from the Financial Examples section of the TK Library.

Sta	Input	Name	Output	Unit	Comment
	100000	Price		\$	purchase price of asset
	20000	down		\$	down payment (after closing costs)
		dp	20	%	down payment as percent of price
		Loan	80000	\$	beginning balance of loan
	15	n		yr	term of loan
	7	r		%/yr	nominal interest rate on loan
		A	719.06	\$/mo	periodic loan payment amount
		T	129431.27	\$	total of payments made over loan term
		Ti	49431.27	\$	total interest paid over loan term
	y	table			generate amortization table? 'y' or 'n' (See Table and Plot Sheets)
					Analysis of a Specific Payment
	12	k		mo	payment to be evaluated
		accum_i	5500.91	\$	total interest paid after k payments
		rg_Loan	76872.16	\$	loan balance after k payments
		E	23127.84	\$	equity after k payments
		pk	269.07	\$	principal part of kth payment
		ik	449.99	\$	interest part of kth payment
					Analysis of an Interval of Payments
	1	f		mo	start (1st payment) of period
	7	l		mo	end (last payment) of period
		pproduct	1797.99	\$	principal paid during period
		iproduct	3235.45	\$	interest paid during period

We will investigate several different banks and payment options and store the results from each of the solutions in a single table for easier comparison.

The first step is to associate lists with any variables we want store in the table. We do this by simply typing an L in the status column.

Sta	Input	Name	Output	Unit	Comment
L	100000	Price		\$	purchase price of asset
L	20000	down		\$	down payment (after closing costs)
L		dp	20	%	down payment as percent of price
L		Loan	80000	\$	beginning balance of loan
L	15	n		yr	term of loan
L	7	r		%/yr	nominal interest rate on loan
L		A	719.06	\$/mo	periodic loan payment amount
L		T	129431.27	\$	total of payments made over loan term
L		Ti	49431.27	\$	total interest paid over loan term

The next step is to create the summary table on the table sheet. After naming the table, we open the subsheet where the lists and headings are defined.

Name	Title
Summary	Summary of the inputs and outputs for different loan scenarios

Copy the Name column from the variable sheet and paste it into the List column in the table subsheet. Only the variables you want stored in the table should be copied.

List	Format	Width	Heading
Price		10	
down		10	
dp		10	
Loan		10	
n		10	
r		10	
A		10	
T		10	
Ti		10	

Next, copy the Comment column from the Variable Sheet into the Heading column of the table subsheet.

List	Format	Width	Heading
Price		10	purchase price of asset
down		10	down payment (after closing costs)
dp		10	down payment as percent of price
Loan		10	beginning balance of loan
n		10	term of loan
r		10	nominal interest rate on loan
A		10	periodic loan payment amount
T		10	total of payments made over loan term
Ti		10	total interest paid over loan term

Next, change the table orientation from Vertical to Horizontal.

Title:	Summary of the inputs and outputs for different loan scenarios
Vertical or Horizontal:	Vertical

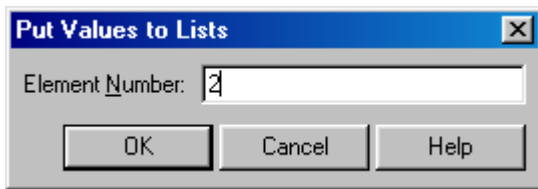
The resulting interactive table should appear with the headings as shown below.

List
purchase price of asset
down payment (after closing costs)
down payment as percent of price
beginning balance of loan
term of loan
nominal interest rate on loan
periodic loan payment amount
total of payments made over loan term
total interest paid over loan term

The columns of the table will each represent a different loan scenario. Optionally, column one can be used to hold the units for each of the variables. You can copy the units column from the variable sheet into the first column of table.

List	1
purchase price of asset	\$
down payment (after closing costs)	\$
down payment as percent of price	%
beginning balance of loan	\$
term of loan	yr
nominal interest rate on loan	%/yr
periodic loan payment amount	\$/mo
total of payments made over loan term	\$
total interest paid over loan term	\$

Now, any values from the variable sheet can be placed into any column of the table using the Put Values to Lists Command in the Commands menu. The command automatically prompts the user for the column number and the values are placed.



List	1	2
purchase price of asset	\$	100000
down payment (after closing costs)	\$	20000
down payment as percent of price	%	20
beginning balance of loan	\$	80000
term of loan	yr	15
nominal interest rate on loan	%/yr	7
periodic loan payment amount	\$/mo	719.06
total of payments made over loan term	\$	129431.27
total interest paid over loan term	\$	49431.27

After each scenario is solved on the variable sheet, it can be added to the table.

List	1	2	3
purchase price of asset	\$	100000	100000
down payment (after closing costs)	\$	20000	20000
down payment as percent of price	%	20	20
beginning balance of loan	\$	80000	80000
term of loan	yr	15	30
nominal interest rate on loan	%/yr	7	7.13
periodic loan payment amount	\$/mo	719.06	538.97
total of payments made over loan term	\$	129431.27	194030.93
total interest paid over loan term	\$	49431.27	114030.93

Notes:

The Unit column of the variable sheet may contain blanks or special characters that do not paste directly into value fields. If your variable sheet includes blank rows or rows with comments but no variable names or units, the Name and Comment columns will copy directly to the table subsheet but the Unit column will not copy directly into the table. You will need to copy blocks of non-blank unit rows from the variable sheet to the table.

You can add an extra row to your table and supply your own table headings. In this example, a new list, Headings, is added with the values shown.

List	Format	Width	Heading
Headings		10	Variable
Price		10	purchase price of asset
down		10	down payment (after closing costs)
dp		10	down payment as percent of price
Loan		10	beginning balance of loan
n		10	term of loan
r		10	nominal interest rate on loan
A		10	periodic loan payment amount
T		10	total of payments made over loan term
Ti		10	total interest paid over loan term

List	1	2	3
Variable	Unit	Case 1	Case2
purchase price of asset	\$	100000	100000
down payment (after closing costs)	\$	20000	20000
down payment as percent of price	%	20	20
beginning balance of loan	\$	80000	80000
term of loan	yr	15	30
nominal interest rate on loan	%/yr	7	7.13
periodic loan payment amount	\$/mo	719.06	538.97
total of payments made over loan term	\$	129431.27	194030.93
total interest paid over loan term	\$	49431.27	114030.93