zgfile(fn)   -   Gets filename. Stores fn in INI file

zgilist(0)   -   Returns a matrix containing the INI key names and values

zsival(key,value)   -   Set INI value corresponding to key name

zgival(key)   -   Get INI value corresponding to key name

zdikey(key)   -   Deletes the INI key and its value

Warning: If an INI value is changed that value will be used throughout the file at the next recalculation.

The following example is only illustrative. If I had hit the F9 key for recalculations each zglist would show all key values not just one or two.

However, this functionality enables values to be shared between SMath files automatically.

$$zgilist(0) = 0$$

$$zgfile(fn) = \text{"C:\textbackslash Users\textbackslash Ed\textbackslash Documents\textbackslash AISC\_SMath.csv"} \qquad \text{"The open file dialog will appear"}$$

$$zsival(key_1, 1.11) = 1.11$$

$$key_1 = 1.11$$

$$zgilist(0) = \begin{pmatrix} \text{"fn"} & \text{"C:\textbackslash Users\textbackslash Ed\textbackslash Documents\textbackslash AISC\_SMath.csv"} \\ \text{"key.1"} & 1.11 \end{pmatrix}$$

$$zsival(key_2, 2.22\ ft) = 0.6767\ m$$

$$key_2 = 0.6767\ m$$

$$zgilist(0) = \begin{pmatrix} \text{"fn"} & \text{"C:\textbackslash Users\textbackslash Ed\textbackslash Documents\textbackslash AISC\_SMath.csv"} \\ \text{"key.1"} & 1.11 \\ \text{"key.2"} & 0.6767\ m \end{pmatrix}$$

$$zsival(key_3, x) = \blacksquare \qquad\qquad\qquad \text{"x not defined"}$$

$$key_3 = \blacksquare$$

$$zgilist(0) = \blacksquare$$

$$zdikey(key_3) = 1$$

$$zgilist(0) = \begin{pmatrix} \text{"fn"} & \text{"C:\textbackslash Users\textbackslash Ed\textbackslash Documents\textbackslash AISC\_SMath.csv"} \\ \text{"key.1"} & 1.11 \\ \text{"key.2"} & 0.6767\ m \end{pmatrix}$$

$$x := \begin{pmatrix} 1 & 10 \ ft \\ 2 & 20 \ ft \\ 3 & 30 \ ft \end{pmatrix}$$

$$zsival\left(key_4, \ x\right) = \begin{pmatrix} 1 & 3.048 \ m \\ 2 & 6.096 \ m \\ 3 & 9.144 \ m \end{pmatrix}$$

$$key_4 = \begin{pmatrix} 1 & 3.048 \ m \\ 2 & 6.096 \ m \\ 3 & 9.144 \ m \end{pmatrix}$$

$$zgilist\left(0\right) = \begin{pmatrix} \text{"fn"} & \text{"C:\textbackslash Users\textbackslash Ed\textbackslash Documents\textbackslash AISC\_SMath.csv"} \\ \text{"key.1"} & 1.11 \\ \text{"key.2"} & 0.6767 \ m \\ \text{"key.4"} & \begin{pmatrix} 1 & 3.048 \ m \\ 2 & 6.096 \ m \\ 3 & 9.144 \ m \end{pmatrix} \end{pmatrix}$$

$$v := zgival\left(key_2\right)$$

$$v = 0.6767 \ m$$

In this example the key fn does not exist. The typical open file dialog box will appear. The user can navigate to any directory and select the file. If the key fn does exist the zgfile() function is ignored.

zgidata(fn,key)   -   Gets data record from filename fn corresponding to key name

$$
zgdata\left(fn,\ "W8X24"\right)=
\begin{pmatrix}
"W8X24" \\
"W" \\
350.2537\ \dfrac{kg}{s^2} \\
0.0046\ m^2 \\
0.2014\ m \\
0 \\
0 \\
0.1651\ m \\
0 \\
0 \\
0.0062\ m \\
0.0102\ m \\
0 \\
0 \\
0 \\
0.0202\ m \\
0.0222\ m \\
0.0143\ m \\
0 \\
0 \\
0 \\
0 \\
0 \\
8.12 \\
0 \\
25.9 \\
0 \\
0 \\
3.4422 \cdot 10^{-5}\ m^4
\end{pmatrix}
$$

Only a portion of the screen is shown

I developed this function to retrieve the section properties of standard rolled steel beams. I'm using the AISC (American Institute of Steel Construction) data. Each shape has a comma delimited record in a file. The first record of the file contains the column headers from an Excel file. The second record contains the variable name and units of each column. Name and units are separated by a colon ":". If the column is unitless place the word null following the name and colon in that position. The first column contains the key values. An excerpt of the file is shown below.

AISC_Manual_Label,Type,W,A,d,bf,tw,tf,kdes,x,y,eo,xp,yp,bf/2tf,h/tw,Ix,Zx,Sx,rx,Iy,Zy,Sy,ry,Iz,rz,…
null,null,wt.bm:'lbf/'ft,A.x:'in^2,d.b:'in,b.f:'in,t.w:'in,t.f:'in,k.d:'in,x.cg:'in,y.cg:'in,e.o:'in,x.p:'in,y.p:'in,…
W44X335,W,335,98.5,44,0,0,15.9,0,0,1.03,1.77,0,0,0,2.56,2.625,1.3125,0,0,0,0,0,4.5,0,38,0,0,…
W44X290,W,290,85.4,43.6,0,0,15.8,0,0,0.865,1.58,0,0,0,2.36,2.4375,1.25,0,0,0,0,0,5.02,0,45,0,0,…

The above example will create a file WizFunctions.ini as follows:

fn="C:\Users\Ed\Documents\AISC_SMath.csv",1,0
key.1=1.11,1,0
key.2=2.22,1,0,0.3048,1,0,'m,1,0,*(2),2,2,*(2),2,2
key.4=1,1,0,381,1,0,'m,1,0,*(2),2,2,125,1,0,/(2),2,2,2,1,0,762,1,0,'m,1,0,*(2),2,2,125,1,0,/ …

(2),2,2,3,1,0,1143,1,0,'m,1,0,*(2),2,2,125,1,0,/(2),2,2,3,1,0,2,1,0,mat(8),3,8

If I open a new SMath file the values can be set from the INI file as follows:

$\text{zgfile}(fn) = \text{"C:\Users\Ed\Documents\AISC\_SMath.csv"}$ "The open file dialog does not appear"

$fn = \text{"C:\Users\Ed\Documents\AISC\_SMath.csv"}$

$\text{zgival}\left(key_1\right) = 1.11$

$key_1 = 1.11$

$$\text{zgilist}(0) = \begin{pmatrix} \text{"fn"} & \text{"C:\Users\Ed\Documents\AISC\_SMath.csv"} \\ \text{"key.1"} & 1.11 \\ \text{"key.2"} & 0.6767\ m \\ & \begin{pmatrix} 1 & 3.048\ m \\ 2 & 6.096\ m \\ 3 & 9.144\ m \end{pmatrix} \\ \text{"key.4"} & \end{pmatrix}$$

$key_4 := \blacksquare$ "key.4 not yet set from INI"

$beam := \text{zgdata}(fn,\ \text{"W8X24"})$

$$beam = \begin{pmatrix} \text{"W8X24"} \\ \text{"W"} \\ 350.2537\ \dfrac{kg}{s^2} \\ 0.0046\ m^2 \\ 0.2014\ m \\ 0 \\ 0 \\ 0.1651\ m \\ 0 \\ 0 \\ 0.0062\ m \\ 0.0102\ m \\ 0 \\ 0 \\ 0 \\ 0.0202\ m \\ 0.0222\ m \\ 0.0143\ m \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 8.12 \\ 0 \\ 25.9 \\ 0 \end{pmatrix}$$

General note:

1. For any plugin functions either an equal sign has to follow the function for it to take effect. Or assign a variable to the function. For example:

    zsival(key,value) will not produce results

    zsival(key,value) = will produce results. Be sure and type the equal sign after the function. The return value of 1 means success.

    x = zsival(key,value) will also produce results and x will equal 1 on success.

2. key should always be raw not a previously defined SMath variable.
3. If any INI values have changed, the SMath program will ask if you want to save the changes to the INI file.
4. Also if any INI values are changed it will affect any file that references that key.
5. For Windows 7 The INI file is saved to:
    C:\Users\username\AppData\Roaming\SMath\WizFunctions.ini
6. The zgidata() function can be used with any data. Each record contains the same number of values. The first value is the key. The first record of the data file contains the units. Make sure you precede any unit with the single apostrophe (').   Note you can perform math with the units as follows.

    'lbf/'in^2   or   'kip*'ft

7. I've tried to anticipate most situations but I'm sure some user is going to type something that will make this crash. Just be careful.
8. New in version 0.2, beside zgdata returning an array, variable names can be defined for each column.