



Custom Variables (Virtual Variables)

Allocate not only allows you to select standard variables, but also allows you to create your own unique demographic variables. You may create new variables (Virtual Variables) using any combination of licensed variables or previously created virtual variables. To do so, from the Variables tab, select Add Virtual Variable from the file drop down menu. This will open the Create Formula box.

Add/Edit Virtual Variables	Variable Location
Variable Properties	Using Virtual Variables

Add or Edit Virtual Variables

Formulas

A formula is the calculation that your new variable is made up of. The operators available are +, -, *, and /. They are for addition, subtraction, multiplication and division respectively. Allocate also includes boolean operators. There are also parenthesis available for building formulas (and). Allocate processes mathematical formulas by the standard rules, specifically multiplication, division and anything inside of parentheses first, and then addition and subtraction from left to right. Mathematical functions may also be performed. Variable names may not be changed, but you may add numbers. For instance to create a percentage, you may type * 100. Spaces are not necessary inside of your formulas.

Your formula can be made of existing Allocate variables or of new variables that have been previously created inside of your Custom Formulas file.

Here is an example of a formula created to find out the percentage of the American Indian population compared to the Total Population: $RACCYAMIND/POPCY*100$. Where RACCYAMIND equals American Indian Population for the Current Year and POPCY equals Total Population for the CY, and to create a percentage you would multiply the fraction times 100. There is no limit to the amount of operations you can have inside of your formula.

Create Formulas

The Add or Edit Virtual Variable selections will bring up the Create Formula dialog box. Input Variables include all of the licensed variables you are able to select (those that have a gray square grid next to their name) in addition to any previously created Virtual Variables. Select variables by highlighting them and clicking insert. For operators you may highlight them and click Insert or type them manually. This will place your variable into the formula bar in the last place you had your cursor. Once your variable is inside of the Formula bar, you are able to click on the Next button to complete the variable creation process. You may type your own variable or but you cannot change an existing

variable name. You may delete variables by highlighting them in the Formula bar and hitting the delete button.

Advanced Formula Options

If you are creating custom variables and you have an entire folder that you would like to create the *same* formula for (for example, if you would like to calculate the value for each individual variable for Age as a percentage of Total Population), instead of highlighting each individual variable, highlight the *folder* that the variables are contained in and select Insert from the Variables tab - *F*. Complete your formula as if it were a single calculation and name your variable. When you name your variable, it may be helpful to name it after the folder itself. Allocate will add a unique identifier to each individual Custom Variable name. Then use either Index or Select. This will create an individual formula and individual name for each variable inside of the folder that you have selected.

Functions

A function is a mathematical relation between at least two variable quantities where one of them is dependent upon the others for its values.

Allocate provides these functions:

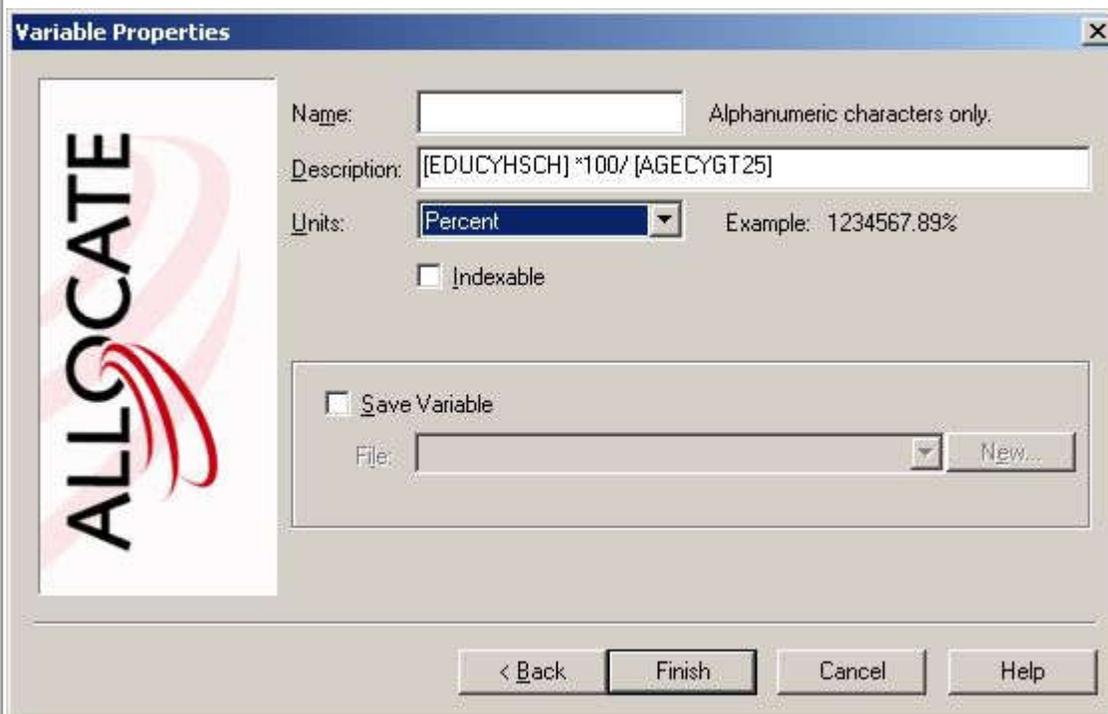
Name	Description
ABS(x)	Absolute Value of (x)
ATAN(x)	Arc Tangent of (x)
BOUND(x,min, max)	If (x) < (min) return (min); else if (x) > (max); else return (x).
CEIL(x)	Return smallest integer greater than or equal to (x)
COS(x)	Cosine of (x)
FLOOR(x)	Return largest integer less than or equal to (x)
GETVAL(index,v1...,vn)	Returns the value(v1..vn) specified by the 0-based index.
IIF(bool,x,y)	If (bool) is true, return (x); else return (y)
INDEX(v)	Returns the index of the expression (v).
INDEXVALUE(x,y)	Returns the index value of the expression (v).
LEFT(x,len)	Return the first (len) characters of the string (x)
LENGTH(x)	Return the length of the string (x)
LOG(x)	Natural logarithm of (x)
LOG10(x)	Base 10 logarithm of (x)
LOWERCASE(x)	Converts a string to lower case.
MAX(v1,v2...vn)*	The value for the variable with the highest count is returned from a series of variables.
MAXIDX (v1,v2...vn)	Returns the index of the maximum value from the list.
MIN(v1,v2...vn)	Returns the minimum value from the list
MINIDX(v1,v2...vn)	Returns the index of the minimum value from the list
POW(x,e)	Return (x) raised to the (e) power
RANGEMEDIAN	Calculates the median from a series of aggregate ranges. See documentation for detail.
RIGHT(x,y,z) ith the character (z)	Return the string (x) after replacing each occurrence of the character (y) w
RIGHT(x,len)	Return the last (len) characters of the string (x)
ROUND(s, mult)	Return (x) rounded to nearest multiple of (mult)
SIN(x)	Sine of (x)
SMARTROUND(x)	Return (x) rounded to nearest multiple of a value determined

SQRT(x)	dynamically based on the size of (x) Square Root of (x)
STRCSPN(x,y)	Return the length of the initial segment of the string (x) consisting of characters not in the string (y)
STRIPQUOTES(x)	Remove quotation marks from the ends of the strings
SUBSTRING(x,start,len)	Return the substring of (x) starting at (start) stopping after (len), if provided
TAN(x)	Tangent of x
TONUMBER(x)	Converts a sting pattern to a number.
TOPNIDX(N, v1, v2,..., vn)(x)	Returns the Nth from the maximum value from the list. With N==1, it is the same as MaxIdx(..)
TOSTRING(x,numDec)	Converts a numeric parameter to a string using (numDec) decimal places.
TRIM(x,y)	Remove characters in the string y from the ends of string x. Defaults to trimming white space.
TRIMLEFT(x,y)	Remove characters in the string y from the beginning of string x. Defaults to trimming white space.
TRIMRIGHT(x,y)	Remove characters in the string y from the end of string x. Defaults to trimming whitespace.
UPPERCASE (x)	Converts a string to upper case

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Variable Properties

After inputting your formula and clicking Next from the Create Formula box, the Variable Properties box appears.



This box allows you to uniquely name, describe, make indexable, and/or provide units to each Custom Variable that you create.

Name- This is the mnemonic descriptor name that you will name your new variable. Depending on your selected Output, you may have to follow rules specific to your database. For instance, if you are

creating a .dbf file, the variable name may be no longer than 10 characters made up solely of alphanumeric characters (letters and numbers) with no spaces (underscores are acceptable).

Description - The Description is the Plain English version of what you would like to call your new variable.

What you enter in this field is what will appear on the Variables tab, so make sure this is something that you will recognize.

Units- The Units drop down allows you to control how the values for your new variable will be displayed when you output them. Acceptable Unit options include Dollars, Integers, and Percentages.

Units	Description	Fractional or Whole No.
Dollars	Dollars.	Whole
Dollars in (000's)	Dollars already divided by \$1,000	Whole
Dollars Round 1,000	Dollars that will be rounded for storage to \$1,000.	Whole
Dollars64	Numbers up to 2 to the 64th power (values will be displayed w/ '\$')	Whole
Dollars2_64	Same as above, but with change (values will be displayed w/ '\$')	Fractional
Fixed1_32	Numbers up to $2^{32}/2$, 1 decimal place	Fractional
Fixed2_32	Numbers up to $2^{32}/2$, 2 decimal places	Fractional
Fixed3_32	Numbers up to $2^{32}/2$, 3 decimal places	Fractional
Fixed4_32	Numbers up to $2^{32}/2$, 4 decimal places	Fractional
Fixed5_32	Numbers up to $2^{32}/2$, 5 decimal places	Fractional
Fixed6_32	Numbers up to $2^{32}/2$, 6 decimal places	Fractional
Fixed2_64	Numbers up to $2^{64}/2$, 1 decimal place	Fractional
Fixed4_64	Numbers up to $2^{64}/4$, 2 decimal places	Fractional
Fixed6_64	Numbers up to $2^{64}/6$, 3 decimal places	Fractional
Households	Number of households	Whole
Index	Indexed value.Indexed value.	Whole
Integer	Integer.	Whole
Integer64	Numbers up to 2^{64}	Whole
Persons	Average number of people (2.42 children)	Fractional with 2 decimal places
Physical2	Square miles. 2 digits of precision.	Fractional with 2 decimal places
Population Percent	Number of people. Percentage.	Whole
Round 10	Input number magnitude may exceed MAX_LONG. Input will be rounded to nearest 10. Handles numbers up to up to 20 billion. On retrieval will have a zero in the 10's place. Allocate stores all input numbers as long, so we need to lose a place of accuracy	Whole, rounded to 10's

	to store numbers greater than MAX_LONG (2 billion).	
Round 100	Same as Round 10, handles numbers to 200 billion and rounds last two digits to zero	Whole, rounded to 100's
Round 1,000	Same as Round 10, handles numbers to 2,000 billion and rounds last three digits to zero	Whole, rounded to 1,000's
Round 10,000	Same as Round 10, handles numbers to 20,000 billion and rounds last four digits to zero.	Whole, rounded to 10,000's
String Text	Strings smaller than 256 characters	
Years	Years, ex. Age.	Whole

Indexable - If your new variable is a calculation (average, percent, median) you can check the Indexable box. This enables the Indexing functionality on this variable.

Save Variable - This next step is optional. If you do not check the Save Variable box, your variable will automatically be added to the Temporary Variables folder. If you do opt to save a variable, a Virtual Variable File (.vvf) will be added permanently and may be shared amongst other users. In the Save Variables box, Click the New button and choose a name for your .vvf (internal and external). The external name will be the one you would look for to send to someone else, or to remove. The internal name should be recognizable so that you can add additional variables to this file if you want to.

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Variable Location and Hierarchy

After clicking on Next from the Variable Properties box, you will be asked to Select the location of the new variable(s) in the variable hierarchy so they will be easy to find in the tree structure for future use. Once you save it, the next time you start up Allocate and go to the Variables tab, your new variable will appear in the custom folder you created, or inside an existing folder structure you selected.

- **New Category** - The Category is the main folder that your new variable will be placed inside of. If you are including a new variable inside of an existing Category folder, make sure that the spelling is correct and that it is in the same case as the existing folder. Click the New Category button. You will be prompted to enter a folder name. New folder names can be edited later if you need to. You are also able to save new variables into the existing folder structure. Simply navigate to the folder where you want the variable saved and place it within the correct vintage and even sub-category.
- **New Vintage** - After you have created your folder, click the New Vintage button. Every variable needs to have an associated vintage. Common examples of this include Months, Quarters, or Current Year. The vintage will break your variable up into the correct year for your SubCategory. Vintage options are Current Year Estimates, Five Year Projections, or US Census. These are just suggestions, you may use another descriptive name to group your variables by year.

- **New Subcategory** - The SubCategory is a folder inside of the main Category folder. This allows you to position your new variables within the tree hierarchy below other folders.

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Using Virtual Variables

After you have created your Custom Variable, you may bring over to your Output Fields Window by pressing either Index or Select.

- **Index** - Select Index if you are comparing your new Custom Variable to an Index Base and you have selected an [Index Base on the Output Tab](#). Create your variable and name it and then press the Index button to create it as an Indexed Variable. Your variable will be moved to the Output Fields Window with an **I** next to it.
- **Select** - Use Select if you would just like to see the numerical value of your calculation in your Output. Allocate will calculate your formula and produce the results inside of your Output selection. The Select button will move your Custom Variable to the Output Fields Window.

Your custom variable now appears in the Input Variables window. This variable will now be available every time you go into Allocate. Virtual Variables that you have created inside of Allocate can be removed at anytime simply by deleting them. You can delete or edit your custom variables by highlighting the variable you want to modify or get rid of and clicking on the appropriate selection from the File menu drop down.

Custom Variables that you have created inside of your Custom Formula file can be removed at anytime simply by deleting them from your Custom Formula file.

Edit Virtual Variables

Allocate allows you to modify your variables. To change your formula or the variable name, just click on the Custom Variable you would like to work with and select Edit Virtual Variable from the File drop down. Make any changes you need to and select Index or Select again then finish. The existing variable is updated and overwritten with the changes.

Clear Temporary Variables

This button will clear everything that you have created inside of the Formula box and the New Variable name box. If you have already brought your Custom Variable to the Output Fields Window, this will not delete the variable, this will only clear the Formula and Name Variable boxes.

Delete Virtual Variables

With this command, you may select virtual variables you no longer need, and then go to Delete Virtual Variables in the File drop down to permanently delete them.

Create Custom Variables from demox Files

Users may capture, count, list records directly from their source files based on filtering criteria that they create from fields in the source files via the Import Customer Data option from the Variables -> File -> drop down.

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