Logic is a group of functions and programs created to support Boolean logic operations like interactive True-Tables and Karnaugh's maps.

Files:
- comby.89p
- karmap3.89i
- karmap4.89i
- karnaugh.89p
- nt.89f

comby(*number of variables*) is a program that creates a table of all combinations of an assigned number of variables and set the screen on the resulted data; you can now enter all Boolean expression you want using data editor.

karnaugh(*table name*, *number of variables*, *number of the column containing the requested function*) calculates the Karnaugh's map of function with 3 or 4 variables.

nt(*variable*) is a function that realizes the logic NOT. nt(var) returns 1 if var=0 and 0 if var=1.

Example of application

I want to analyze Boolean expression with 4 variables.

Enter comby(4) in the home screen. All combinations are displayed in the new data "combytab"

Now I want the truth table of the expression: (C4 AND NOT C2) OR C3.
Just use nt(C2) for NOT C2

	c1	c2	c3	c4	c5	c6
1	0	0	0	0	0	
2	0	0	0	1	1	
3	0	0	1	0	1	
4	0	0	1	1	1	

c5=c4 and nt(c2) or c3

If you want to see the Karnaugh's map of fifth column:
Enter Karnaugh("combytab", 4, 5):

If you want you can also save the map.

Exercise:
Find a simple representation for this logic relation:

$$Y = \overline{A} \text{ AND } \overline{B} \text{ AND } \overline{C} \text{ OR } A \text{ AND } \overline{B} \text{ AND } \overline{C} \text{ OR } C \text{ AND } D \text{ OR } C \text{ AND } \overline{D}$$

Enter **comby**(4) (You have four variables)
In the C5 space enter original Y with C1 instead of A, C2 instead of B etc. (use **nt**(var) for NOT):

C5= nt(C1) and nt(C2) and nt(C3) or C1 and nt(C2) and nt(C3) or C3 and C4 or C3 and nt(C4)

Now in the home screen enter **karnaugh**("combytab",4,5):

Now looking at the map you have to chose the easier combination (crossing) of variables that gives the same points on the map:

The correct function is:

$$Y = C \text{ OR } \overline{B} \qquad\qquad (C3 \text{ or } nt(C2))$$

You can verify it entering C6=C3 or nt(C2) in your table and C7=C5-C6: if all C7 elements are '0' the relation is correct.
You can also enter in the home screen sum(combytab[7]^2): if it returns '0' the relation is good.

For 3 or 4 variables use comby(3) or comby(4): karnaugh supports both the options; if you have less than 3 variables it is not a problem: use comby(3) and enter the correct relation like other times: the 3rd variable is simply not considered by the program.

This program has been already used many times without problems. If you find any bug first assure you to have selected the English language in the Mode and not to have translated the code with any program. If the problem persists, please, let me know.

For a better and faster answer, please, enclose some screenshot of the bug: entered inputs, expected outputs, error messages, erroneous code line, Mode setting… it will help me very much!
My address is paolosilingarditi@interfree.it; write **TI-Program** as Object of e-mail**!**

IN ORDER TO PREVENT SPAMMING, E-MAIL WITHOUT THE CORRECT OBJECT WILL BE AUTOMATICALLY DELETED!

You can find all my programs at this address:
http://www.ticalc.org/archives/files/authors/44/4458.html.

Remember to vote this program in the site!

Paolo Silingardi