Logic.exe by: Chuck Mire, artmaker43@gmail.com
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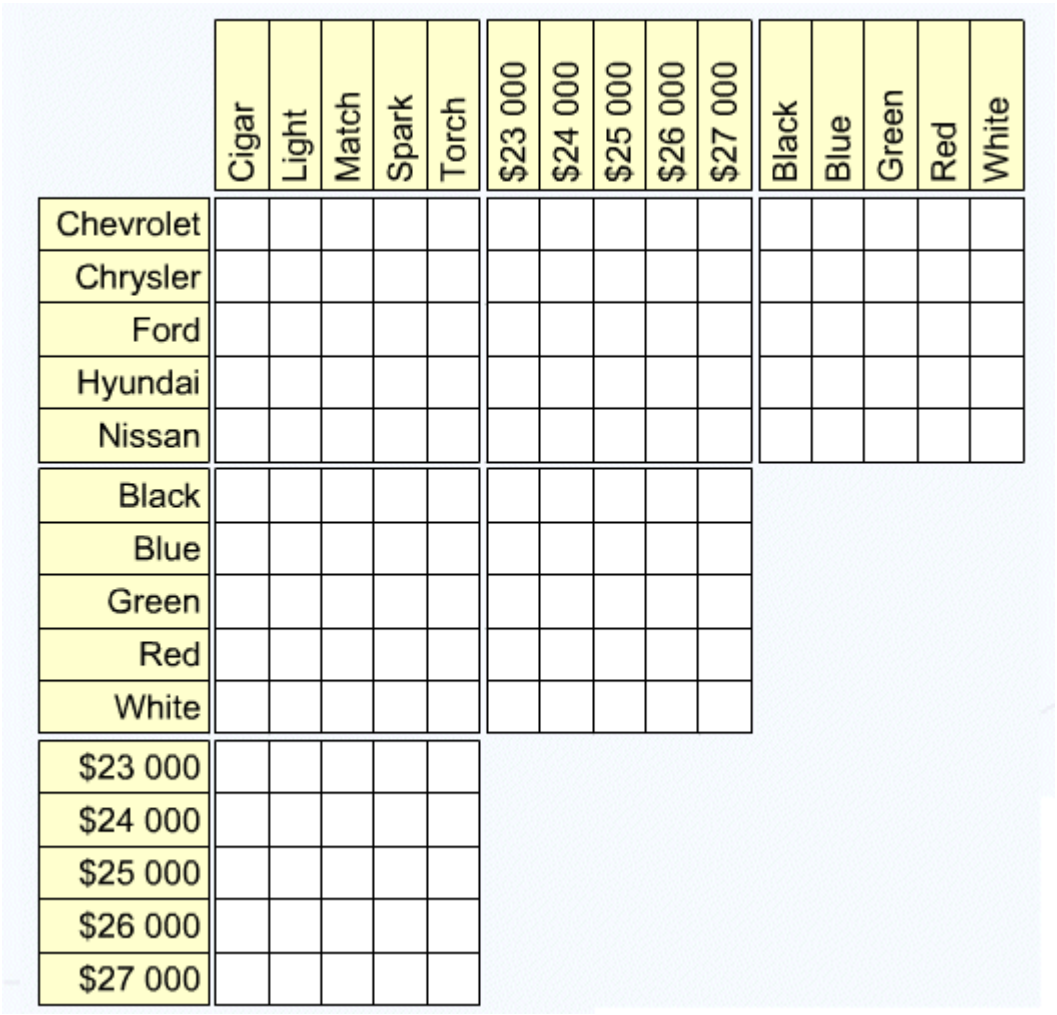
Logic problems are available in books and on the Web and are solved by filling in a grid (usually manually). Here is one example that was downloaded from the Web:

http://www.puzzles.com/Projects/LogicProblems/ReplacingTheCar.htm

Don needed to replace his old car. So he figured out his budget and spent a month looking at new cars and used cars at different dealerships. At the end of the month, he had narrowed his options down to five possible cars. He was very surprised when he realized that his final five choices were all from different manufacturers. Determine the make and type of each car on his final list, the price of each car, and the color of each car.

1. The Chrysler Light wasn't $27,000. The black car wasn't the Hyundai.
2. The white car cost $2000 more than the Chevrolet. The Cigar, which wasn't blue, cost $25,000.
3. The Torch wasn't red. The Spark wasn't a Chevrolet.
4. The Match, which wasn't a Ford, was green. The Nissan cost $1000 more than the white car.
5. The red car wasn't the Spark. The Chevrolet wasn't $23,000.
6. The Hyundai was $4000 less than the Match.



My program, ***Logic.exe*** allows this to be done on screen in a semi-automatic mode which greatly aids in solving problems such as this. Here is a screen shot partially showing how the grid above is entered:

```
                              LOGIC WORKSHEET

<L>oad a Saved Worksheet, <N>ew Worksheet, or <Q>uit: <N>


How Many Variable TYPES: 4


How Many INDIVIDUALS per TYPE ( > 1 and <= 7 ): 5


Type 1 Individual 1 is (Max Length = 16): chevrolet
Type 1 Individual 2 is (Max Length = 16): chrysler
Type 1 Individual 3 is (Max Length = 16): ford
Type 1 Individual 4 is (Max Length = 16): hyundai
Type 1 Individual 5 is (Max Length = 16): nissan
Type 2 Individual 1 is (Max Length = 16): cigar
Type 2 Individual 2 is (Max Length = 16): light
Type 2 Individual 3 is (Max Length = 16): match
Type 2 Individual 4 is (Max Length = 16): spark
Type 2 Individual 5 is (Max Length = 16): torch
Type 3 Individual 1 is (Max Length = 16):


                  To change PREVIOUS entry, just hit <Enter>
```

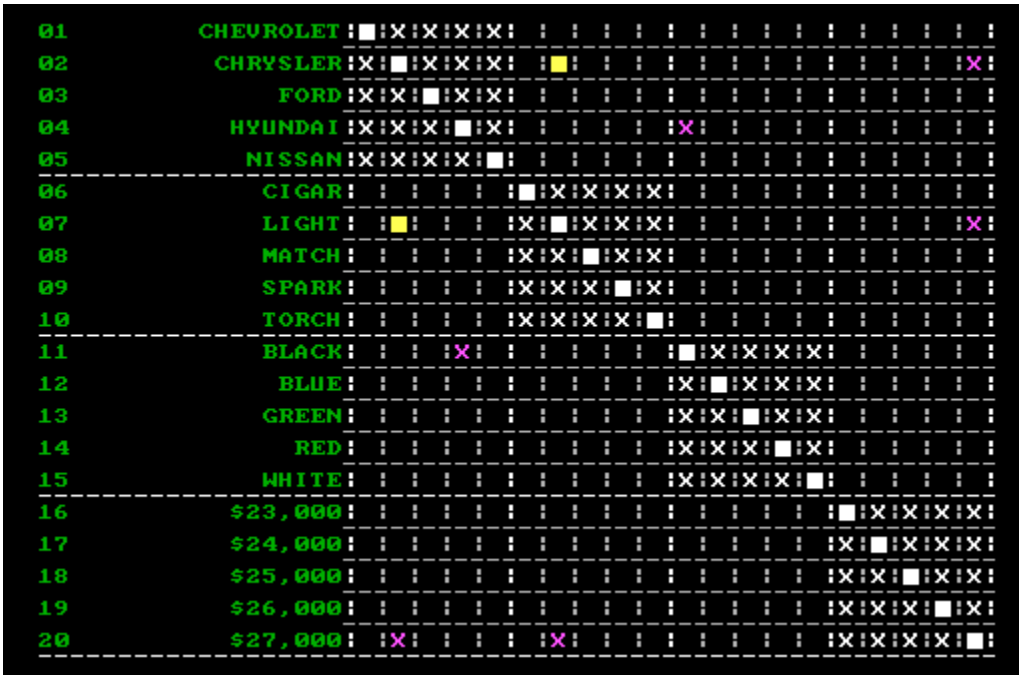
After the last entry is entered (Type 4 Individual 5 for this problem) the program displays this grid:

```
01          CHEVROLET:■:X:X:X:X: : : : : : : : : : : : : : : : : :
02           CHRYSLER:X:■:X:X:X: : : : : : : : : : : : : : : : : :
03               FORD:X:X:■:X:X: : : : : : : : : : : : : : : : : :
04            HYUNDAI:X:X:X:■:X: : : : : : : : : : : : : : : : : :
05             NISSAN:X:X:X:X:■: : : : : : : : : : : : : : : : : :
06              CIGAR: : : : : :■:X:X:X:X: : : : : : : : : : : : :
07              LIGHT: : : : : :X:■:X:X:X: : : : : : : : : : : : :
08              MATCH: : : : : :X:X:■:X:X: : : : : : : : : : : : :
09              SPARK: : : : : :X:X:X:■:X: : : : : : : : : : : : :
10              TORCH: : : : : :X:X:X:X:■: : : : : : : : : : : : :
11              BLACK: : : : : : : : : : :■:X:X:X:X: : : : : : : :
12               BLUE: : : : : : : : : : :X:■:X:X:X: : : : : : : :
13              GREEN: : : : : : : : : : :X:X:■:X:X: : : : : : : :
14                RED: : : : : : : : : : :X:X:X:■:X: : : : : : : :
15              WHITE: : : : : : : : : : :X:X:X:X:■: : : : : : : :
16           $23,000: : : : : : : : : : : : : : : :■:X:X:X:X:
17           $24,000: : : : : : : : : : : : : : : :X:■:X:X:X:
18           $25,000: : : : : : : : : : : : : : : :X:X:■:X:X:
19           $26,000: : : : : : : : : : : : : : : :X:X:X:■:X:
20           $27,000: : : : : : : : : : : : : : : :X:X:X:X:■:
```

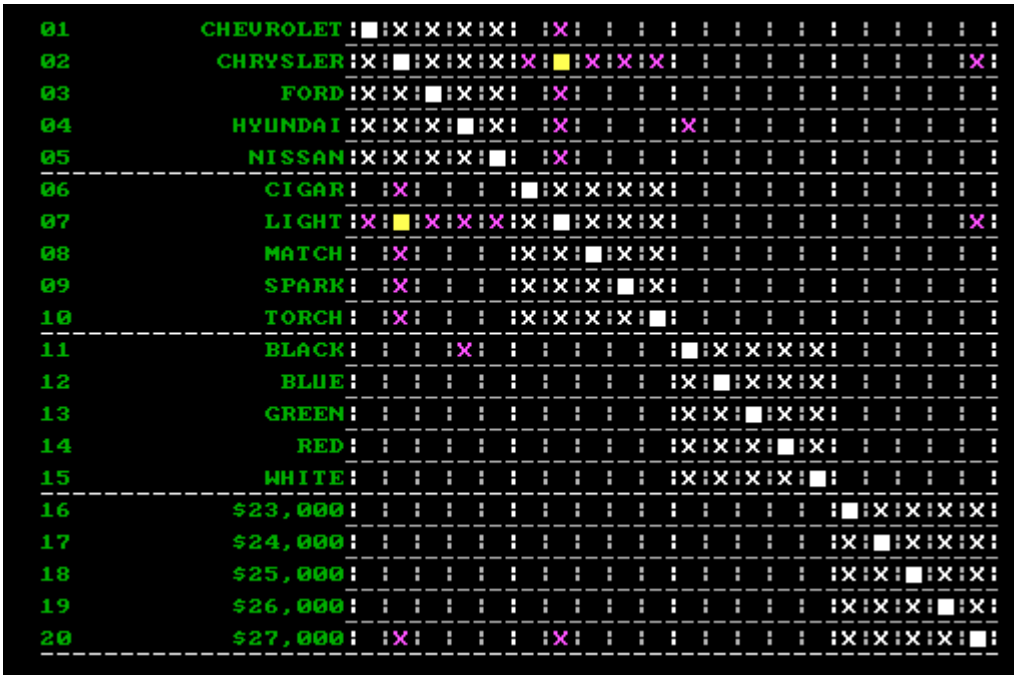
Notice how each variable is automatically numbered. When matching for True or False, the variables' numbers are referenced as shown in the screen shot below (See data on Line 1 of the problem above):

```
                          LOGIC WORKSHEET MENU

File Name: SOLUTION.DAT (Modified)

<A>uto Fill, <C>lear Grid, <Q>uit Game, <S>how Grid, or <V>ariable Match: <V>

The 1st Variable NUMBER: 2

The 2nd Variable NUMBER: 7

<T>rue, <F>alse, or <C>lear: T




                  To change PREVIOUS entry, just hit <Enter>
```

The grid is then displayed with the True intersection(s) displayed with a yellow filled-in square and False intersection(s) displayed with a pinkish-red 'X'. The grid below represents Line 1 of the above logic problem totally completed:

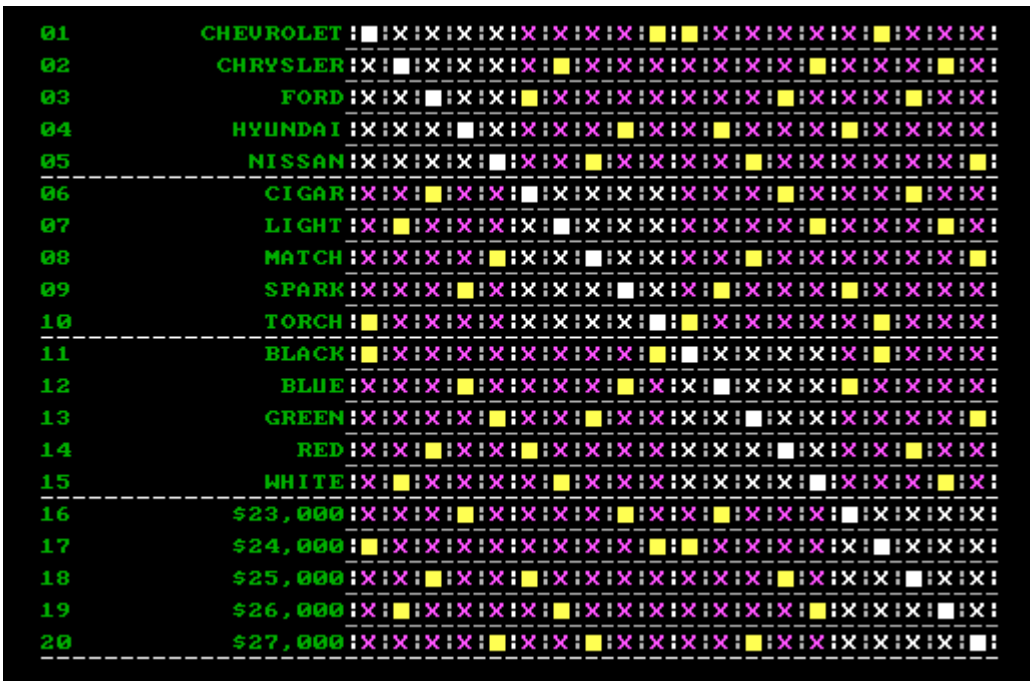


Next is the use of the "Auto Fill" option. You can choose to leave the "Auto Fill" option on or just use it for one instance at a time. I prefer to use the latter approach.



Notice how all the appropriate False intersections have automatically been filled in. Also notice the mirror symmetry of the grid. For instance coordinates 2,7 (True) has its mirror image at 7,2 (True).

The problem is solved when the grid is totally filled out. The solution to this logic problem is shown in the grid below (read down each column).



Chevrolet	Torch	Black	$24,000
Chrysler	Light	White	$26,000
Ford	Cigar	Red	$25,000
Hyundai	Spark	Blue	$23,000
Nissan	Match	Green	$27,000