Appendix B – Tutorial

This tutorial shows a step-by-step instruction of entering exemplary function and obtaining structure realizing this function.

Goal:

Implement the function $F = (1,2,4,12,13,14,15,18(6,7))_{x_3x_2x_1x_0}$ *in a tree of multiplexers structure, where size of each multiplexer is 8 bits.*

Executing the program causes the window (Fig. 1) to be displayed.

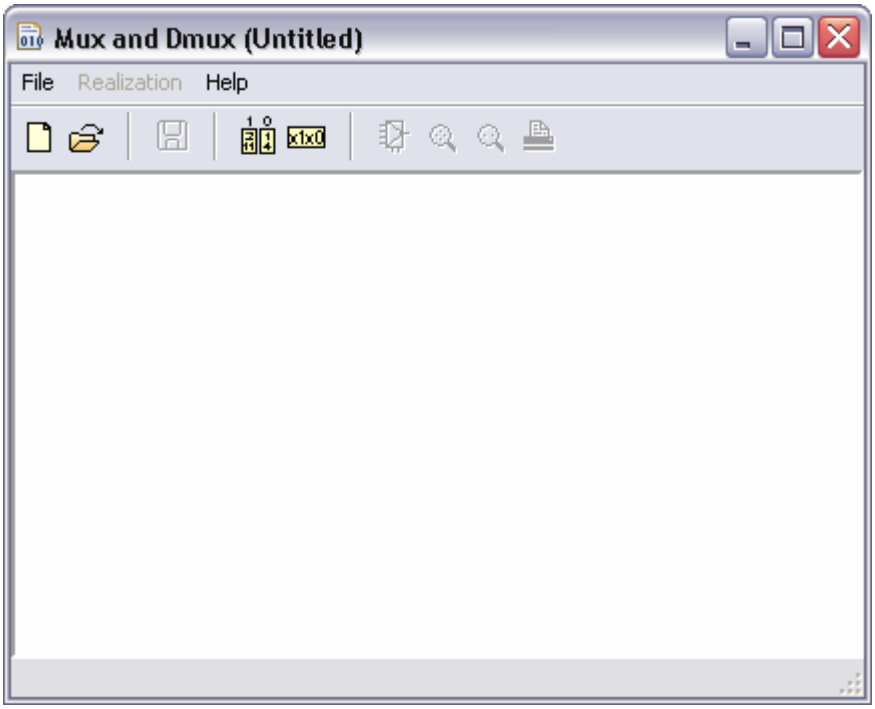
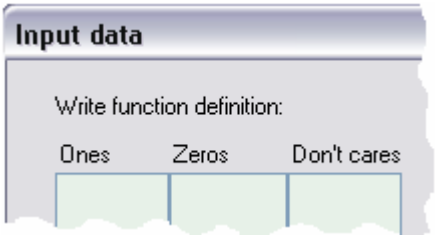


Fig. 1. Main program window (tutorial)

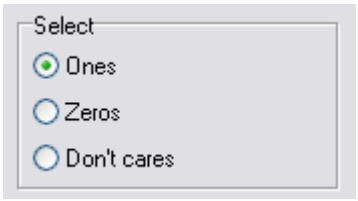
The function definition should be entered to the program in i.e. canonical numerical form, thus a user should click button or select appropriate menu options – **File ⇒ New function ⇒ Canonical representation**. Window shows up, as in Fig. 2. The window consists of:

– Three lists of values: *Ones*, *Zeros*, *Don't cares*,



– Text edit field,

– Radio group options selecting to which list the value entered in the text field should be put,



– Buttons: "**Add**", "**Clear All**", "**OK**", "**Cancel**".

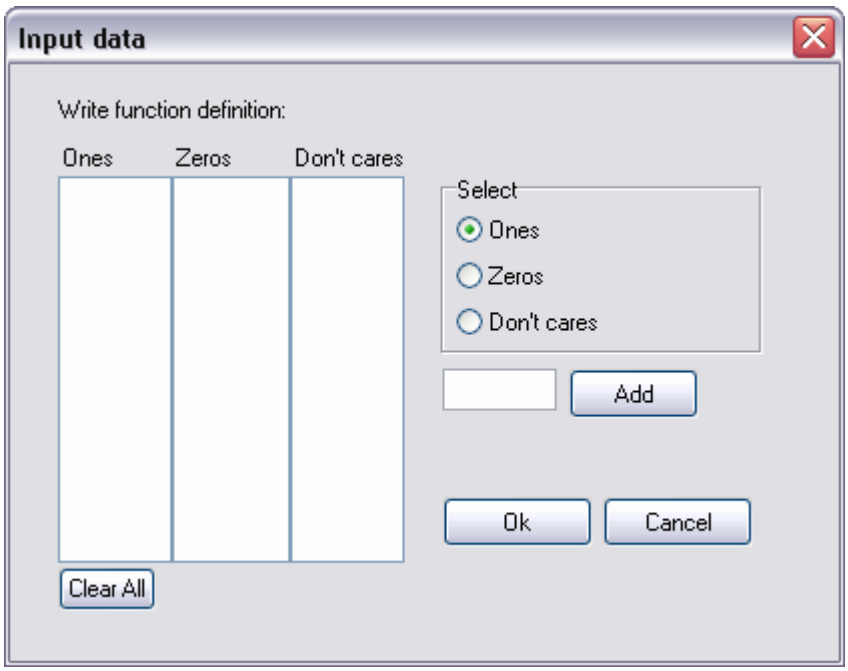


Fig. 2. Window that enables entering function definition in canonical form (tutorial)

To enter function ones components user is required to do:

1. Select to which list the value should be added, by clicking on one of the radio buttons, thus click "*Ones*",
2. In text field individual one component should be entered,
3. Button "**Add**" should be clicked.

Steps 2 and 3 should be repeated until all ones components are entered. In case of mistake (i.e. misspelling, wrong list selection) user can delete the value entered by selecting this value and clicking right mouse button, and choosing "**Delete**" from popup menu, as shown in Fig. 3.

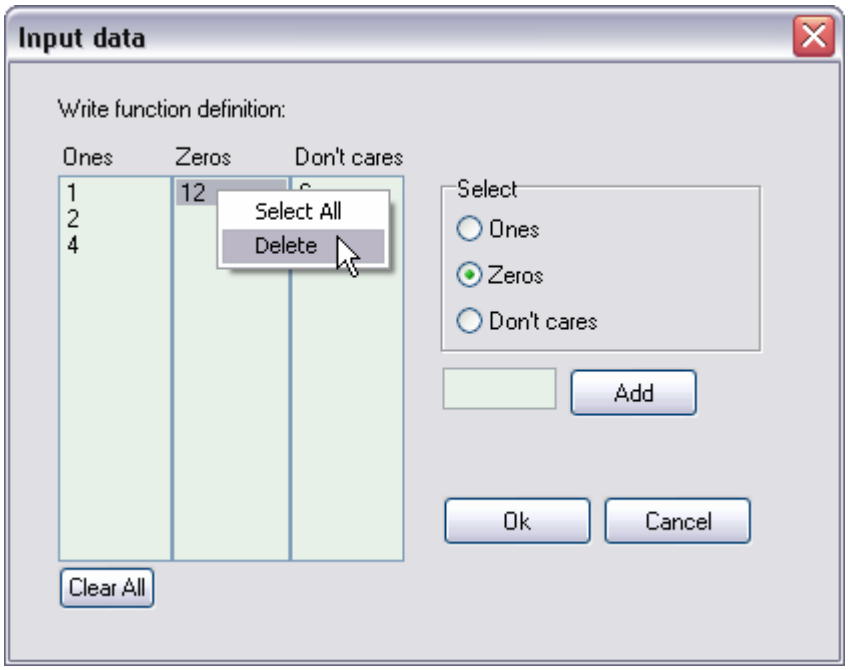


Fig. 3. Deleting term from the list (tutorial)

In order to enter don't care states the same algorithm is used apart from the first step. Here, user should select other radio group button by clicking "*Don't cares*" button. When all function components are entered the window should look similar to this shown in Fig. 4.

To apply the changes user is required to click "**OK**" button.

Beginning of function implementation process is achieved by clicking **Realization** from the program menu or *realization* icon from the toolbar. The window shows up, where user should select required structure (Fig. 5).

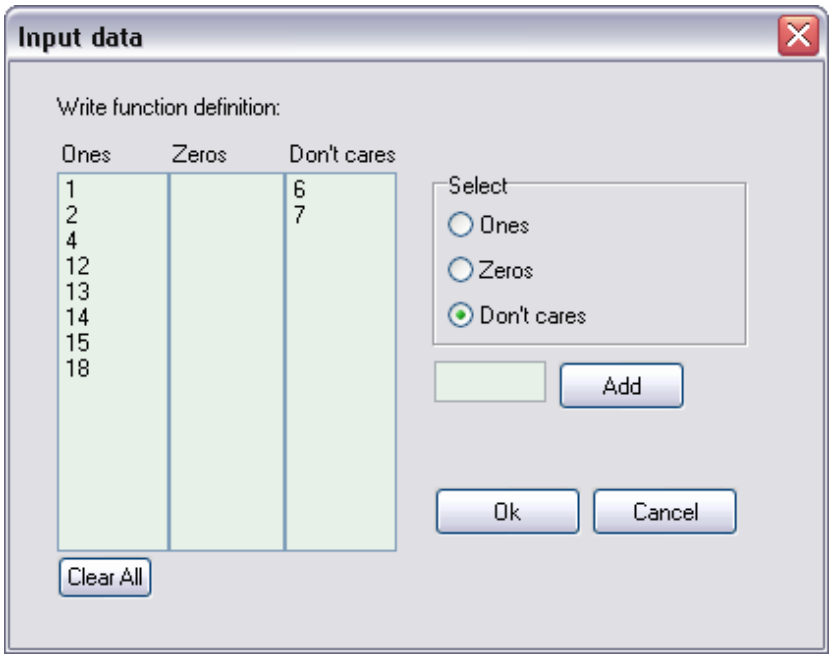


Fig. 4. Window showing all values properly entered (tutorial)

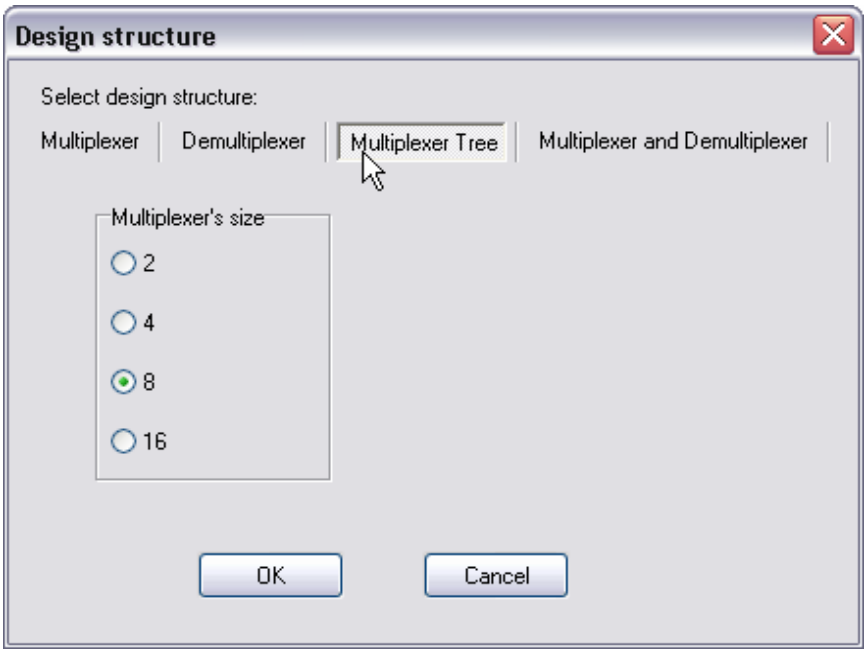


Fig. 5. Structure selection window (tutorial)

As it is shown the only one parameter to set, in order to generate multiplexer tree structure, is the size of a multiplexer. Therefore user should click **8**, as it is stated in the goal of this example. Then "**OK**" button should be clicked to generate the required structure. The window shows up (Fig. 6).

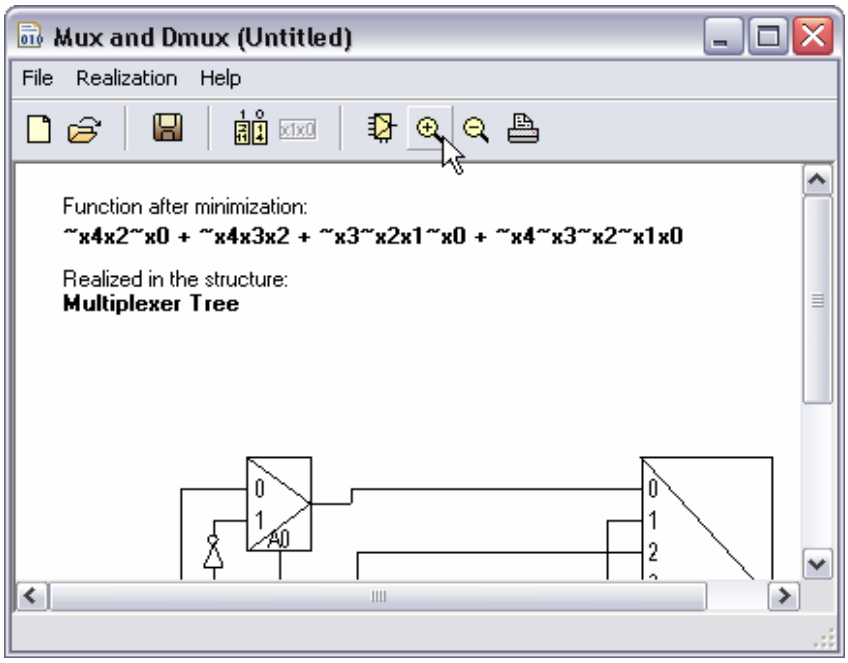


Fig. 6. Window showing the structure generated (tutorial)

Since not full structure is visible in the window it is necessary to either change size of this window or zoom in or zoom out. Fully visible structure is presented in Fig. 7. As it can be seen only one 8-bit multiplexer is needed, remaining multiplexers are 2-bit.

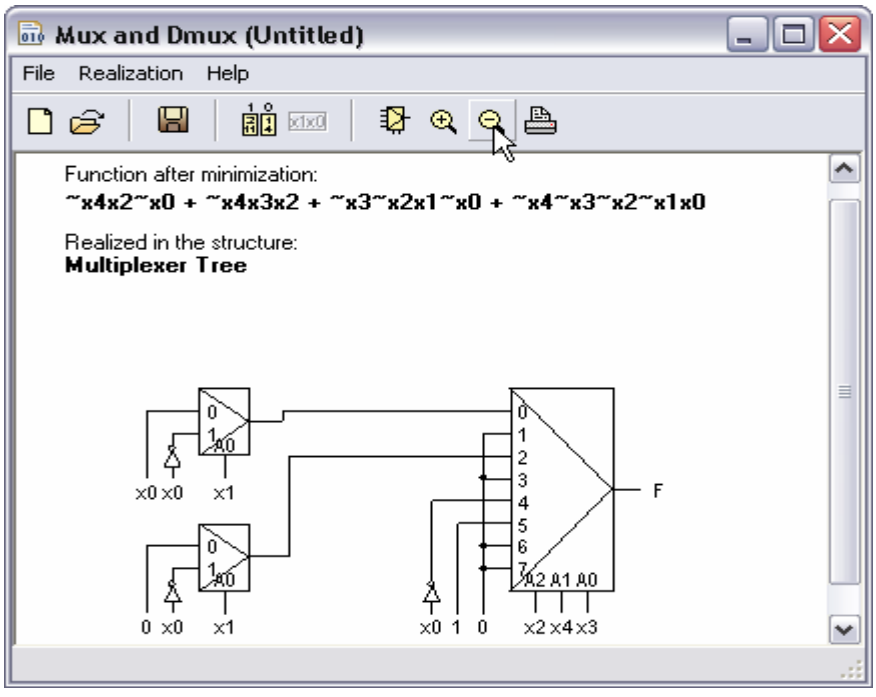


Fig. 7. Window presenting fully visible structure (tutorial)

The goal of the tutorial is completed so it is advised to save the project for later use, print it or export it to graphical format. Saving may be performed in two

ways, as a project or as a function. When user needs to save the function definition only, he discards the diagram generated. In the case when the structure is obtained, a better solution is to save data in project definition file, by selecting **File ⇒ Save project as...** or toolbar icon  . In the dialog box appeared the user needs to supply the file name.

The project can also be printed or a printer can be set up in **File ⇒ Print setup**. In order to print a project user should select from program menu **File ⇒ Print project** or click toolbar icon  . It is also useful to export the generated structure and use it in any graphical program or word processor. The structure may be saved in a graphical format (WMF, BMP, JPEG) as a diagram file (only structure) or as a project file (structure and function definition). To export the generated structure user should select from program menu **File ⇒ Export diagram** or **File ⇒ Export project**.