

Logic Gate Minimisation Demonstration

Nurul Sarkar, Khaleel Petrus
Auckland University of Technology
Auckland, New Zealand
nurul.sarkar@aut.ac.nz

Introduction

In a separate contributed paper, Sarkar *et al.* have described the process of developing a software package for logic gate minimisation. This presentation outlines how the package can be used effectively as a teaching and learning tool for simplifying as well as verifying results of Boolean expressions minimisation.

Software Demonstration

At the conference the research team will demonstrate the use of the package to minimise Boolean expressions involving variables of size up to 8. The package can be run from any PC operating under MS DOS/Windows. To run the package, the user can either double click "newqm.exe" or type "newqm" at the DOS prompt. The main steps of using this package (from Windows) are summarised below:

- 1 **Run the package:** Double click the "newqm.exe"
- 2 **Entering minterms:** Select "New" option to enter a new set of minterms. The user will be prompted for the number of variables to be used. After entering the appropriate number of variables, a matrix of cells with index number will appear on the screen. At this point the user can enter each minterm by selecting a cell by pressing <enter> key from the keyboard.
- 3 **Accepting data:** When a set of minterms have been entered, press <F8> to accept.
- 4 **Display diagram:** The minimised logic gate diagram can be seen on the screen in graphics mode. The user can zoom the diagram using <F1>, <F2>, and <F3> keys for 100%, 50%, and 20% scaling respectively. To go back to main menu, press <F10>.
- 5 **Display minterms and Output:** Select "Min/Out" option from the main menu to see the list of minterms (that have been entered) and the

minimised output expression.

- 6 **Exit from the program:** Select "Quit" option from the main menu to exit from the program.

Concluding Remarks

In this poster presentation we have outlined the procedure of using the package effectively for logic gate minimisation. The package is easy to learn and can be used as a teaching and learning tool for verifying results of Boolean expressions minimisation. The various features and upgrading options are described in a separate contributed paper. The package can be distributed free of charge for teaching and research purposes.