BOOLE-DEUSTO

A new approach to educational software for logic analysis and design

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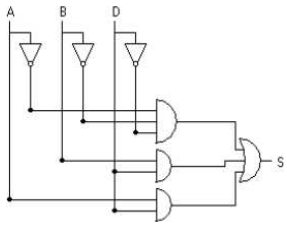
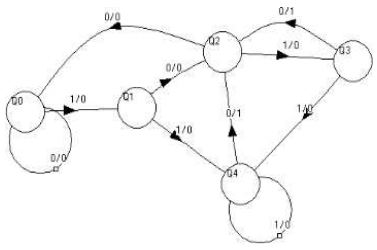
What is BOOLE-DEUSTO?

- Software package capable of analysis and design of combinational circuits and finite state machines.
- Intended for use in introductory Digital Electronics courses in Engineering studies.





Pedagogical Justification

- Professional software: OrCAD, ISE, Xilinx, ...
  - Good for *professional* applications and complex projects
  - Not adequate as teaching tools for *beginners*
  - Difficult to use, expensive, focus on results
- BOOLE-DEUSTO
  - Designed from the start as a teaching tool
  - Most of its features can be found in professional applications, however...
  - Easy to use, free, focus on methodology

Features

Combinational Systems
Truth Table
Boolean Expression
Canonical Forms
Minimized Expressions
NAND/NOR Expressions
Circuit Logic
Veitch-Karnaugh Diagrams
Veitch-Karnaugh Learning Mode

Finite State Machines
Moore-Mealy's Diagrams
FSM verification
Tables and Minimized Expressions
J-K and D Circuit Logic
State Minimization
Moore <-> Mealy Conversion
Interactive and batch simulations

Program-wide features
Code generation
Save and load systems to/from disk
Associate text with a system
Print systems in their various representations

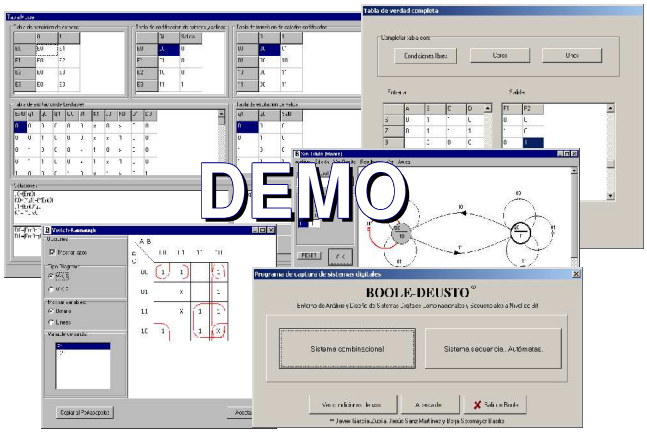
Teaching Experience (I)

- BOOLE-DEUSTO has been used in Deusto since 1996.
- Both students and teachers are satisfied with BOOLE's performance as a teaching tool.
- Survey carried out this year:
  - Students regard it as a powerful and pedagogical tool.
  - Students admit they don't use it as regularly as they should.

Teaching Experience (II)

Question	Result
Relevance as a teaching aid	
Is BOOLE-DEUSTO didactic/pedagogical?	3,9
Is it useful to document exercises?	3,5
Has it fulfilled your needs as a student?	3,5
Should the use of BOOLE-DEUSTO and similar software packages be encouraged?	3,9
Features	
Is BOOLE-DEUSTO atractive?	3,2
Is it easy to use?	4,1
Is BOOLE-DEUSTO effective at showing the results of an operation?	3,5
Does BOOLE-DEUSTO generate correct results?	4,5
Is it easy to install?	4,8
Relevance in current course	
Has BOOLE-DEUSTO been useful to you in this course?	2,6
Has BOOLE-DEUSTO been useful to perform boolean minimization?	3,4
Has BOOLE-DEUSTO been useful to work with FSMs?	3
Have you used BOOLE-DEUSTO regularly during this course?	2,2

Demonstration



Conclusions

- BOOLE-DEUSTO is a complete and didactic, and even professional environment for bit-level analysis and design of combinational and sequential digital systems.
- Its pedagogical focus, centered on methodology instead of results, makes it an ideal teaching aid in Digital Electronics courses.
- BOOLE-DEUSTO's development is frozen. Adding more features would make it stray from the pedagogical realm to the professional realm.

Questions?

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