**Availability of Meth8/VŁ4 demo for 2-variables (p,q) with unlimited sequents**

This is free on request from info@ersatz-systems.com.

Please state name and organization to receive:

Unrestricted m8_executable.exe;

Instructions.txt with known anomalies; and

Editable sample meth8_input_file.txt.

The input file contains the shortest confirmation of McCune's proof of Huntington's equation.

From:  en.wikipedia.org/wiki/Robbins_algebra

LET    p, q:    a, b.

(~(~p+q)+~(~p+~q))=p ;                    TTTT  TTTT  TTTT  TTTT

The input file contains the shortest refutation of paraconsistent logic.

From:  en.wikipedia.org/wiki/Paraconsistent_logic#An_ideal_three-valued_paraconsistent_logic

(4) To establish that a formula $\Gamma$ is equivalent to $\Delta$ in the sense that either can be substituted for the other wherever they appear as a subformula, one must show

$$((\Gamma\rightarrow\Delta)\wedge(\Delta\rightarrow\Gamma))\wedge((\neg\Gamma\rightarrow\neg\Delta)\wedge(\neg\Delta\rightarrow\neg\Gamma)).$$

LET    p, q:    $\Gamma, \Delta$.

((p>q)&(q>p))&((~p>~q)&(~q>~p)) ;      TFFT  TFFT  TFFT  TFFT

The input file also contains the refutation for provability logic of the Gödel-Löb axiom GL as, "The necessity of *choice*, as always implying *a choice*, implies always *a choice*."

$\Box(\Box p\rightarrow p)\rightarrow\Box p$.

LET    p:    *choice*.

#(#p>p)>#p ;                              CTCT  CTCT  CTCT  CTCT

**Availability of Meth8/VŁ4**

Manifest of files distributed in current release 2019 June 4 v.10 (2019.06.04.10):

1. Install programs:

   M8_installer.exe
   machine.exe

2. Logic system parameter file:

   meth8_parameter_file.txt
   meth8_parameter_file.txt.bak (backup)

3. $ 99.97 program of  4 propositional variables (p...s),      4 theorems (A...D):

   M8_04.exe

4. $149.97 program of 11 propositional variables (p...z),    no theorems:

   M8_00.exe (companion program to M8_04.exe)

5. Meth8 input file for equations:

   METH8_INPUT_FILE.txt
   METH8_INPUT_FILE.txt.bak (backup)

6. Parsing anomalies:

   M8_parsing_anomalies.pdf


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# Scalability of  Meth8/VŁ4

**Abstract:**  We offer two more packages in Meth8 to process increasing numbers of propositional variables.

To derive scalability statistics of Meth8, the test platform was

HPE-519c, AMD II X6 1065T 2.96 GHz, 16.0 GB RAM, 64-bit OS with ordinary load.

We tabulate:  the number of propositional variables;  time in seconds (or minutes, hours, days) for building the look up tables (LUTs) in real time;  the size of the LUTs built;  the number of rows output for the resulting truth table (with each row being a 16-byte table by five models);  and the output in bytes for the resulting truth table.  The designations in powers of 1024 bytes are prefixed as "...bibytes", where **K,M,G** are kibibytes, mebibytes, gibibytes; and **s**, **m**, **h**, **d** are second, minute, hour, day.

| Variables | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LUT build **s** | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.3 | 0.6 | 1.6 | 4.1 | 12.2 | 55.2 | 3.7**m** | 14.5 | 58.8 | 3.9**h** | 15.7 | 2.6**d** |
| LUT size | 1**K** | 3 | 8 | 18 | 41 | 92 | 205 | 451 | 983 | 2.1**M** | 4.6 | 9.8 | 21 | 44.6 | 94.4 | 19. | 421 | 888 | 1.9**G** |
| Result rows | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 256 | 512 | 1024 | 2048 | 8192 | 16**K** | 32 | 64 | 128 | 256 | 512 |
| Result bytes | 80 | 160 | 320 | 640 | 1**K** | 2.6 | 5.1 | 10.2 | 20.5 | 41 | 81.9 | 20.5 | 655 | 1.3**M** | 2.62 | 5.24 | 10 | 21 | 41 |

The literature rarely invokes more than 11 variables except in the cases of inductive, brute-force proofs.  Building the logic LUTs on the fly for 11 or less variables takes less than one second.  Therefore for 12 or more variables we recommend using external media LUTs that are pre-computed.  For example, the build of LUTs for 7 theorems takes 15m.  Testing conjectures with variables only is an effective way to avoid the enormous overhead of theorems and even larger output table results.

The maximum number of alphabetic variables allowed in one character is 24 because "i" and "o" are not allowed for clarity if capitalized.  The maximum RAM footprint of the Meth8 engine as implemented is about 2^31 bytes or 2.1 GB.  However on our test platform, LUTs of 12 or more variables take more time to execute than one second in real time to build in RAM.  Therefore, we build external storage files of LUTs for 12 or more variables.  The size of the external drive limits the number of such LUTs by variable number.  A DVD capacity of 4.70 GB stores LUTs of 4 to 20 variables or 4 to 22 variables.  We offer two options for externalized storage with pricing:

| | |
|---|---|
| $ 97 | 4 propositional variables, and 4 theorem variables |
| | (included in $147 below) |
| $147 | 4 to 11 propositional variables |
| $497 | 4 to 20 propositional variables (DVD 4.70 GB) |
| $797 | 4 to 22 propositional variables (DVD 4.70 GB) |

The engine software is licensed according to the package.  LUT performance is linear as a function of table size.  Output performance is based on the number of rows of result tables printed to the screen and hard disk.