

QMC (Quine Mc Cluskey)

<p>QMex: examples for QM1step</p> <p>[OK] shows example</p>	<pre> 2: 1: [OK] shows example </pre> <div> <div>QM1 examples</div> <div> ex1: [['A' 'B' 'C' 'D' ex2: [['A' 'B' 'C' 'D' ex3: [['x1' 'x2' 'x3' ex4: [['x3' 'x2' 'x1' ex5: [['A' 'B' 'C' 'D' </div> </div>	<pre> 1: </pre>
<p>EDIT shows first rows of truth table</p> <p>QM1step: 1. step of QMC shows minterm table (2.6s)</p>	<pre> 4: 1: </pre>	<pre> 2: 1: </pre>
<p>QM1step: first table with prime implicants (5.7s)</p> <p>QM1step: second table with prime implicants (14s)</p>	<pre> 2: 1: </pre>	<pre> 2: 1: </pre>
<p>QM2step: prime implicants chart (4.6s)</p> <p>Cdom: column dominance (2s)</p>	<pre> 3: 2: 1: </pre>	<pre> 3: 2: 1: </pre>
<p>QM->F: simplified boolean function (1.2s)</p> <p>QMex: second example</p>	<pre> 3: 2: 1: </pre>	<pre> 2: 1: </pre>
<p>QM1step: (8.4s)</p> <p>QM1step: (15.6s)</p>	<pre> 1: </pre>	<pre> 2: 1: </pre>
<p>QM2step: (8.4s)</p> <p>Cdom: (2.8s)</p>	<pre> 2: 1: </pre>	<pre> 2: 1: </pre>
<p>Rdom: row dominance (2.2s)</p> <p>Cdom: (1.7s)</p>	<pre> 2: 1: </pre>	<pre> 2: 1: </pre>

Rdom: (0.9s)	2: <pre>x 1 0 x 0 x 1 1 x 0 1 1 0 1 x 1 1 0 x 1 1 x 0 1</pre>	3: <pre>x 1 1 1 x 0 1 1 0 1 x 1 1 0 x 1 1 x 0 1 0 H4 H5 H7 p2 0 0 1 p5 0 1 0 p1 1 0 0</pre>
QM->F: (1.2s)	1: <pre>QMex QMist QNest Cdon Rdon QH+F</pre>	1: <pre>QH+F</pre>
FxTable: boolean to table (1.4s) and back (1s)	A'C'D+A'B'D+B'C' <pre>A B C D 0 x 1 1 1 0 x 1 x 1 0 x</pre>	A'C'D+A'B'D+B'C' <pre>NOT A AND C AND D OR A AND NOT C AND D</pre>
FxF: boolean to short form and back (1s)	1: <pre>FxTab FxF F+CTo Fsiex Fsimp QHhel</pre>	1: <pre>FxTab FxF F+CTo Fsiex Fsimp QHhel</pre>
F->CTable: boolean to complete table with results (0.9s)	<pre>A B C D 0 0 0 0 0 0 0 1 0 0 1 0 0 0 1 1 0 1 0 1 0 1 0 1 0 1 1 1 0 1 1 0</pre>	<div style="border: 1px solid black; padding: 5px;">Fsimpl examples 'A(B+C'+D)+A'B' 'A*B*C'+A*B*1+C'*A*B+D 'B*A*C'*D+D*C*B*A 'A*B+A*C+1'</div>
Fsiex: examples Fsimpl	TEXT OK	CANCEL OK
Fsimp: simplify boolean directly (2.5s)	A(B+C'D)+A'B D'A'C'+B'A	A(B+C'D)+A'B D'A'C'+B'A
QMhelp: help	QMC Quine Mac Cluskey Method simplify boolean functions F [H] = Minterm table [I] = prime implicant table [PI] = prime implicant chart QMC info at end QMex + [H] examples QMstep QMstep [H] + [H][I], [I] + [I] 1. phase QMC stepwise truth table to table with prime implicants	QMCinfo: start with truth table eventual output column must be named P, see ex in QMex (1101 = A AND B AND NOT C AND D) 1.1 omit terms with output 0 every row = minterm n; press QMstep 1.2 apply resolution rule p+i=x repeatedly for all pairs 0011+0111=0x11 0x11+1x11=xx11
QMhelp: help	FxF Function to table F + F' boolean function to short form, example: A AND NOT B OR C + A*B'+C F+CTable F + I boolean F to complete table with output P Fsiex + F examples Fsimpl Fsimpl F + F' simplify boolean function directly, use only vars A..J (not A1..) A+A=A, A+A'=1	QMC info: phase 1: start with truth table eventual output column must be named P, see ex in QMex (1101 = A AND B AND NOT C AND D) 1.1 omit terms with output 0 every row = minterm n; press QMstep 1.2 apply resolution rule p+i=x repeatedly for all pairs 0011+0111=0x11 0x11+1x11=xx11
QMhelp: help	end with prime implicants pi 0xix = NOT A AND C press QMstep phase 2: From start table with n; and end table with pi generate prime implicant chart qj=(pi,nj)=1 if mii=pi, 0 else3 2.1 generate prime impl. chart press QMstep 2.2 column dominance, omit Hb if Ha ≤ Hb press Cdon	2.3 press Cdon row dominance, omit pa if pa ≤ pb press Rdon 2.4 repeat 2.2 and 2.3 as long as possible generate simplified F press QH+F Because of exp. runtime of QMC the programs are only suited for F with not too many variables