I made a couple of adjustments to the program. The adjustments are more for when the cost of each operator is 1. The idea is if you have some truth value, 00110101 for example, and combine it with some operator with a, why would you also try combining the same truth value with the same operator with a if it costs more the second time around for that truth value. I made the program save a list of truth values seen by the base circuits (each input and each circuit that has a cost of 1). If it tries to nor it with the same truth value a second time, the circuit will be rejected. It seems to still find minimum cost circuits, but I cannot tell if it is finding *all* of them or just some of them. I used the number of truth values found at each point to test it. For and,or,not each with a cost of 1, it the number of found truth values doesn’t change. For nor only costing 1 the number of found did vary at cost 6. Without the modification, it found 192, but with it only found 189. In summary, this option speeds it up, but makes it less accurate

**One element**

{NAND}, {NOR}.

**Two elements**

{OR, NOT}, {AND, NOT },

{ aIMPLIESb, NOT }, { bIMPLIESa, NOT },

{ aIMPLIESb, 0}, { bIMPLIESa, 0},

{ aIMPLIESb, XOR}, {bIMPLIESa, XOR},

{ aIMPLIESb, aNIMPLIESb }, {aIMPLIESb, bNIMPLIESa},

{ bIMPLIESa, aNIMPLIESb }, { bIMPLIESa, bNIMPLIESa },

{ aNIMPLIESb, NOT}, { bNIMPLIESa , NOT},

{ aNIMPLIESb, 1}, { bNIMPLIESa, 1},

{ aNIMPLIESb, XNOR}, { bNIMPLIESa, XNOR}.

**Three elements**

{ OR, XNOR, 0}

, { OR, XNOR, XOR}

, { OR, XOR, 1}

, { AND, XNOR, 0}

, { AND, XNOR, XOR}

, { AND, XOR, 1}.

I made some progress with the code. I will finalize it tomorrow. Today I added an option to specify a truth value that you want it to find and stop when it is found. I also found a way to fix the problem of it skipping costs. Now it runs and is able to mutate the lists as it goes through them.

At 1, I met with Bryan and Jing and discussed what Jing was working on. We plan to meet again tomorrow at 1.

Tomorrow I will work on adding the ability for it to sort and write to a file the found truth values and their min circuits at each check point rather than printing them to the console. Then I will work on complete, thorough commenting. Finally I will make a README file with instructions on how to use and send it to Bryan so he can see if it is understandable and useable.