Find example of when the elimination found something smaller than without elimination. This would be an example of when going to a higher level can give a more simple circuit than stopping at a lower circuit. Confirm that all 16 of the two input circuits were correct.

Number of circuits made by no elimination: 16

1000 : 1 gates used to make (a.b)

1011 : 3 gates used to make (((a.b).a).0)

1110 : 4 gates used to make (((a.0).(b.0)).0)

1010 : 1 gates used to make (b.0)

0010 : 2 gates used to make ((a.b).b)

0101 : 0 gates used to make b

0011 : 0 gates used to make a

0000 : 0 gates used to make 0

1101 : 3 gates used to make (((a.b).b).0)

0110 : 5 gates used to make (((a.0).(b.0)).(a.b))

1111 : 0 gates used to make 1

1100 : 1 gates used to make (a.0)

0100 : 2 gates used to make ((a.b).a)

0111 : 2 gates used to make ((a.b).0)

0001 : 3 gates used to make ((a.0).(b.0))

1001 : 4 gates used to make (((a.b).a).((a.b).b))

I thought that we could use the maximum number of circuits found by the elimination method as a criteria for determining whether or not a circuit should be appended to the list. This reduced the number of circuits in level 5 but not by enough. Bryan thought of instead of saving the level as an ArrayList, we save it to a file at each level, and when making the next level, we read from the files containing the previous levels. This would shift where the data has to be stored to the hard drive allowing for a lot more space for calculation. I created a short program to test this method. It will see how big a file level 5 would be so we could approximate how big a file higher levels would be.

The file writing is running slower than I hoped.

It took 25699kb for a file of level 5. I did a projection assuming the size of the file grew linearly with the number of circuits. It appears that level 6 would take 8953gb of hard drive space. This seems a bit unrealistic. Might need to test it out to see if it will be able to complete level 6 and to see if the file will actually be as big as the projection.

I am learning the ins and outs of input output so I can attempt to use Bryan’s method to reach the 6th level.

By Tom pointing out nothing is better than the first two levels, I was able to remove anything that has the same truthTable as anything in the first two levels or anything that has a pure 1 truthTable. This reduced the number of items in levels 1,2,3,4,5 from 4,6,39,1131,694434 to 4,6,27,417,94155 respectively. Which is a great improvement, but not enough to make the sixth level with java still. I will try to combine this with the use of writing a new file and bounding the number of gates by 12 and see if this combination of techniques will be able to make the sixth level.