

Test Compaction Tool for Combinational Circuits

You can perform compaction using several approaches as explained below: The tools given here run on **unix** machines e.g. **sunfire8.ccse.kfupm.edu.sa**

1. Based on reversing the order of the test vectors and also random arrangement. The script **rrcompact** will do that for you. For example, suppose that you have the circuit **c5315.bench** which has **178** primary inputs and **276** test vectors. To compact the test set using this script, you need to run the command **rrcompact c5315 178 10**. Note that the first argument is the circuit name, the second argument is the number of primary input and the third argument is the number of iterations. Note that the test set is compacted from 276 test vectors to 120 test vectors. The compacted test file will be saved in the file **c5315.hope**

2. Another approach for compaction of test sets for combinational circuits is by relaxing the test set and then merging the test vectors.
 - a. To relax a test set means to find the X values in it. You can relax a test set by running the command **relax circuit**. Your test vectors to be compacted must be in the file **circuit.hope**. The relaxed test set will be returned in the file **circuit.xtest**. For example, to relax the test set in **c5315.hope**, you run the command **relax c5315**. Now, if you view the files **c5315.xtest** you will see the returned X's in the file.
 - b. Now, you can compact the test vectors by merging them together. To do that you need to run the command **hmerge test n**, where **test** is the name of your test file and **n** is the number of input. For example, to merge the test vectors in **c5315.xtest**, run the command **hmerge c5315.xtest 178**. The merged test vectors will be save in the file **c5315.xtest.m**.

3. After compacting your test set based on relaxation and merging (based on step 2), you can now randomly fill the X's by 0's and 1's and repeat steps 1 and 2 until no further compaction is possible. To randomly fill the X's with 0's and 1's, you can use the command **randfill circuit n**, where **circuit** is the circuit name and **n** is the number of primary inputs. Copy your test from the file **c5315.xtest.m** into **c5315.hope**. Now run the command **randfill c5315 178**. This will fill the X's in the original test file and return the test set in the file **c5315.hope**.