

Pairwise Testing

The first use of a pairwise testing tool was used to gather an initial test case sample that contains all possible combinations. The data was structured into the following three sets shown in figure 1.

Component	Burner Setting	Oven Setting
Burner 1	Off	Off
Burner 2	Regulated	Bake
Burner 3	High	Broil
Burner 4		Clean
Oven		

Figure 1.

This produced a list of 60 possible test cases (as shown in figure 1). This initial test plan provides full coverage for every combination, but has redundancies and some test cases that don't make much sense and has far too many cases to provide a minimized test plan to save time and provide quicker testing on each item.

Using the AETG algorithm with the pairwise testing tool provides us with a test plan of 20 cases. This plan only contains a few redundant cases or cases that are not needed. While this plan provides good coverage, we will try to create a customized plan to remove any redundancies and condense some of the test cases together.

Using the customized plans ended up producing more test cases than the AETG produced plan. After trying to customizing the plan to reduce the test cases, I ended up going back to how the data was being structured and realized that the Component:Oven set item was redundant. I removed that set item and re-ran the pairwise tester for all possible combinations and it produced a test plan of 48 cases. The AETG algorithm now provides a test plan of 16 cases with the data being updated. After looking at the test plan, I saw that it needed revised more due to only one burner being used at a time, we want to allow multiple burners to be active at the same time.

With the final revision, we come up with a test plan that has 16 test cases using the AETG algorithm. These cases provide full test coverage on the entire device. While there is a test case that could be opted for removal, the everything set to off case, we include to ensure there is nothing strange happening even while everything is supposed to be turned off. The finalized data set is shown in Figure 2 and the resulting test plan is shown in the tables after the data set.

Burner 1	Burner 2	Burner 3	Burner 4	Oven Setting
Off	Off	Off	Off	Off
Regulated	Regulated	Regulated	Regulated	Bake
High	High	High	High	Broil
				Clean

Figure 2.

Resulting Test Plan

Test Case 1	
Burner 1	Off
Burner 2	Off
Burner 3	Off
Burner 4	Off
Oven Setting	Off

Test Case 2	
Burner 1	Off
Burner 2	Off
Burner 3	Off
Burner 4	Regulated
Oven Setting	Clean

Test Case 3	
Burner 1	Off
Burner 2	Off
Burner 3	Off
Burner 4	High
Oven Setting	Off

Test Case 4	
Burner 1	Off
Burner 2	Off
Burner 3	Off
Burner 4	High
Oven Setting	Bake

Test Case 5	
Burner 1	Off
Burner 2	Regulated
Burner 3	Regulated
Burner 4	High
Oven Setting	Clean

Test Case 6	
Burner 1	Off
Burner 2	High
Burner 3	Regulated
Burner 4	Regulated
Oven Setting	Broil

Test Case 7	
Burner 1	Off
Burner 2	High
Burner 3	High
Burner 4	Off
Oven Setting	Bake

Test Case 8	
Burner 1	Off
Burner 2	High
Burner 3	High
Burner 4	Regulated
Oven Setting	Off

Test Case 9	
Burner 1	Regulated
Burner 2	Off
Burner 3	Regulated
Burner 4	Regulated
Oven Setting	Bake

Test Case 10	
Burner 1	Regulated
Burner 2	Regulated
Burner 3	Off
Burner 4	Off
Oven Setting	Broil

Test Case 11	
Burner 1	Regulated
Burner 2	Regulated
Burner 3	High
Burner 4	Off
Oven Setting	Off

Test Case 12	
Burner 1	Regulated
Burner 2	High
Burner 3	Off
Burner 4	High
Oven Setting	Clean

Test Case 13	
Burner 1	High
Burner 2	Off
Burner 3	High
Burner 4	Off
Oven Setting	Clean

Test Case 14	
Burner 1	High
Burner 2	Off
Burner 3	High
Burner 4	High
Oven Setting	Broil

Test Case 15	
Burner 1	High
Burner 2	Regulated
Burner 3	Off
Burner 4	Regulated
Oven Setting	Bake

Test Case 16	
Burner 1	High
Burner 2	High
Burner 3	Regulated
Burner 4	Off
Oven Setting	Off