

## Lab 11: Counter Test Plan

In this lab, you will implement a functional coverage plan for our counter. Test that we've implemented the following operations and scenarios:

1. Check all operations: `inc`, `load`, `reset`, `nop`
2. Check all operations followed by all other operations (including 2 in a row.)
3. Increment Rollover from `8'hFF` to `8'h00`

### Coverage Class

The coverage class is defined in the `coverage.svh` file. The file will compile, and the coverage object is connected to the monitor, but there are no covergroups yet. Your job is to add the covergroups.

Please create the following:

1. A covergroup that contains a bin for every operations in the `ctr_op` enumerated type. This fulfills the first coverage requirement.
2. A covergroup that contains a bin for every possible transition between two operations in `ctr_op`. This fulfills the second coverage requirement.
3. A covergroup with two bins and a cross:
  - a. Create a coverpoint with a bin for every operation.
  - b. Create a coverpoint bin that captures the transition on `ctr_val` from `8'ff` to `8'00`.
  - c. Create a cross between the two coverpoints and use the `binsof()` and `intersect` operators (remember the `!`) to cover the third coverage requirement.

Simulate the design in the GUI to check your results.