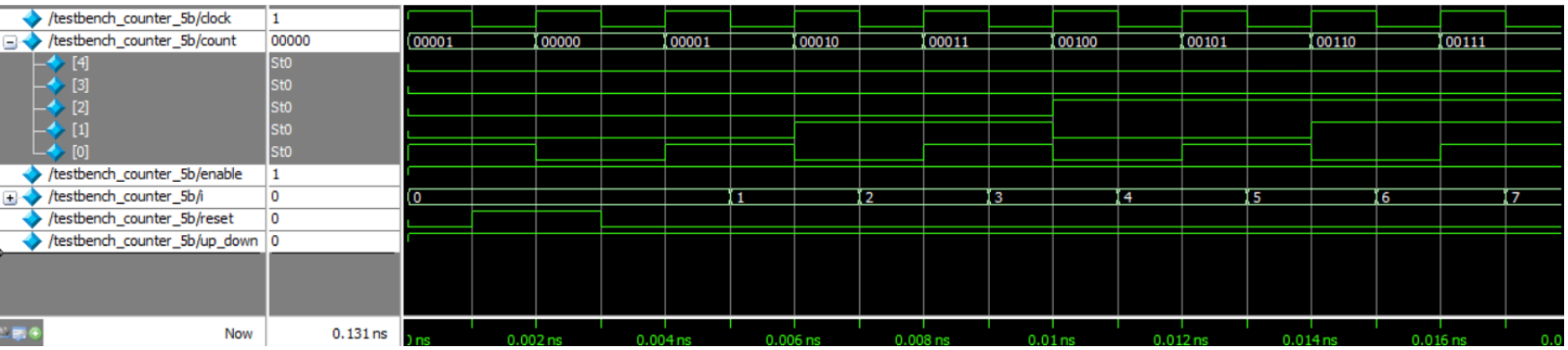
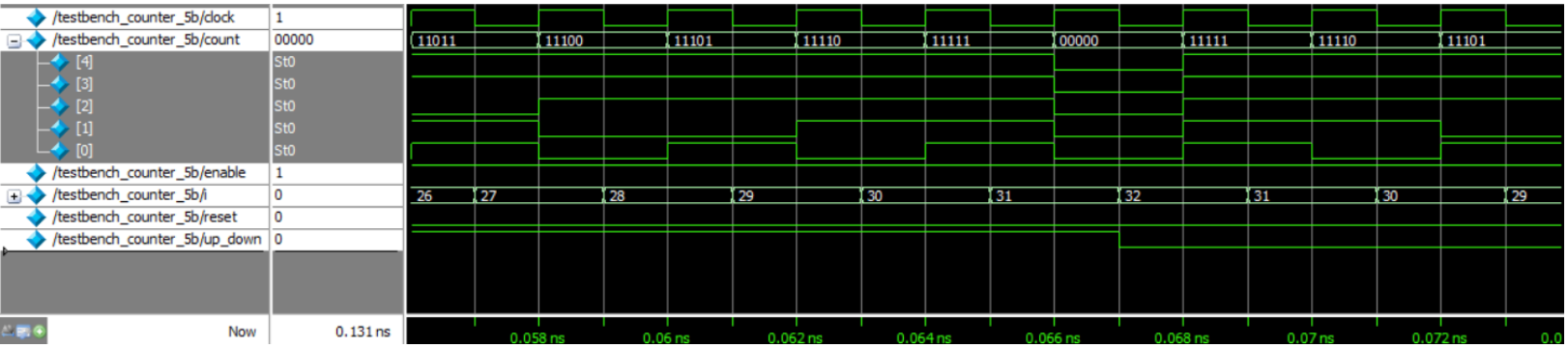
5-Bit Counter Testbench

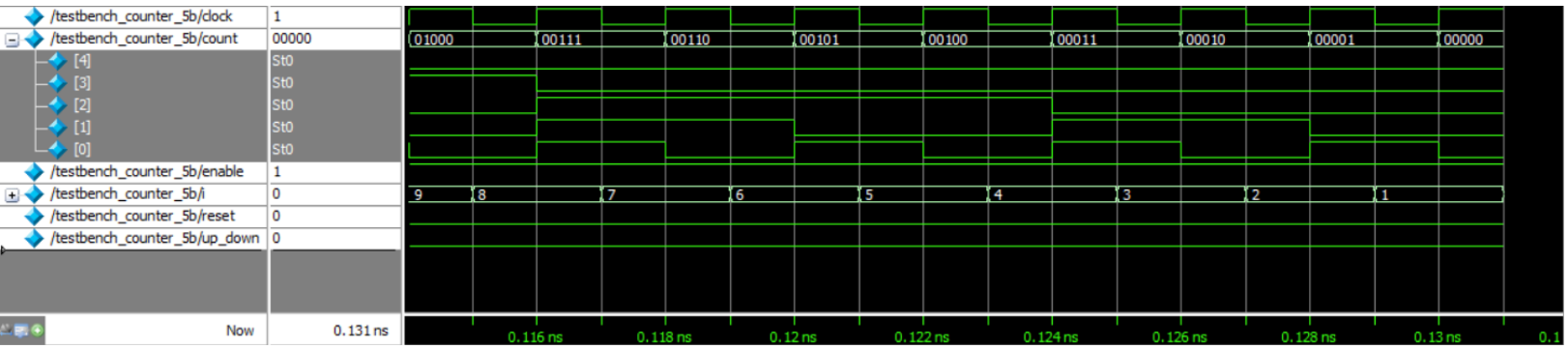
[BELOW: pulse reset at beginning, begin counting up]



[BELOW: brief rollover while counting up, then reverse count direction]



[BELOW: counting down all the way to zero]



Answer this question: If we had a 1024 bit counter and limited testing time, what strategies would you use to verify the counter is functional without testing every single value?

You could set up the test bench to verify the count value after a random number of time units have passed. You could also test edge cases such as whether the counter rolls over as expected when counting up or down near a value boundary.

AES Decryption Testbench

```
VSIM 98> run -all
# KEY:  2f791da0c6c5b42f4fd04785a3170653
# Yeah, yeah, yeah, yeah, yeah
#
# Yeah, yeah, yeah, yeah, yeah, yeah
#
# I think I did it again
#
# I made you believe we're more than just friends
#
# Oh, baby
#
# It might seem like a crush
#
# But it doesn't mean that I'm serious
#
# 'Cause to lose all my senses
#
# That is just so typically me
#
# Oh, baby, baby
#
# [Chorus:]
#
# Oops!... I did it again
#
# I played with your heart, got lost in the game
#
# Oh, baby, baby
#
# Oops!... You think I'm in love
#
# That I'm sent from above
#
# I'm not that innocent
#
# You see my problem is this
```

```
# I'm dreaming away
#
# Wishing that heroesâthey truly exist
#
# I cry watching the days
#
# Can't you see I'm a fool in so many ways
#
# But to lose all my senses
#
# That is just so typically me
#
# Baby, oh
#
# [Chorus]
#
# Yeah, yeah, yeah, yeah, yeah, yeah
#
# Yeah, yeah, yeah, yeah, yeah, yeah
#
# "All aboard"
#
# "Britney, before you go, there's something I want you to have."
#
# "Oh, it's beautiful, but wait a minute, isn't this..?"
#
# "Yeah, yes it is."
#
# "But I thought the old lady dropped it into the ocean in the end."
#
# "Well, baby, I went down and got it for you."
#
# "Oh, you shouldn't have."
#
# Oops!... I did it again to your heart
#
# Got lost in this game, oh, baby
#
# Oops!... You think that I'm sent from above
#
# I'm not that innocent
# ** Note: $stop    : C:/Users/mbkea/Documents/_OIT/2021/Winter/cst-231/labs/_4/lab4_aes_tb.v(74)
#    Time: 3954 ps  Iteration: 0  Instance: /lab4_aes_tb
# Break in Module lab4_aes_tb at C:/Users/mbkea/Documents/_OIT/2021/Winter/cst-231/labs/_4/lab4_aes_tb.v line 74

VSIM 99>
```