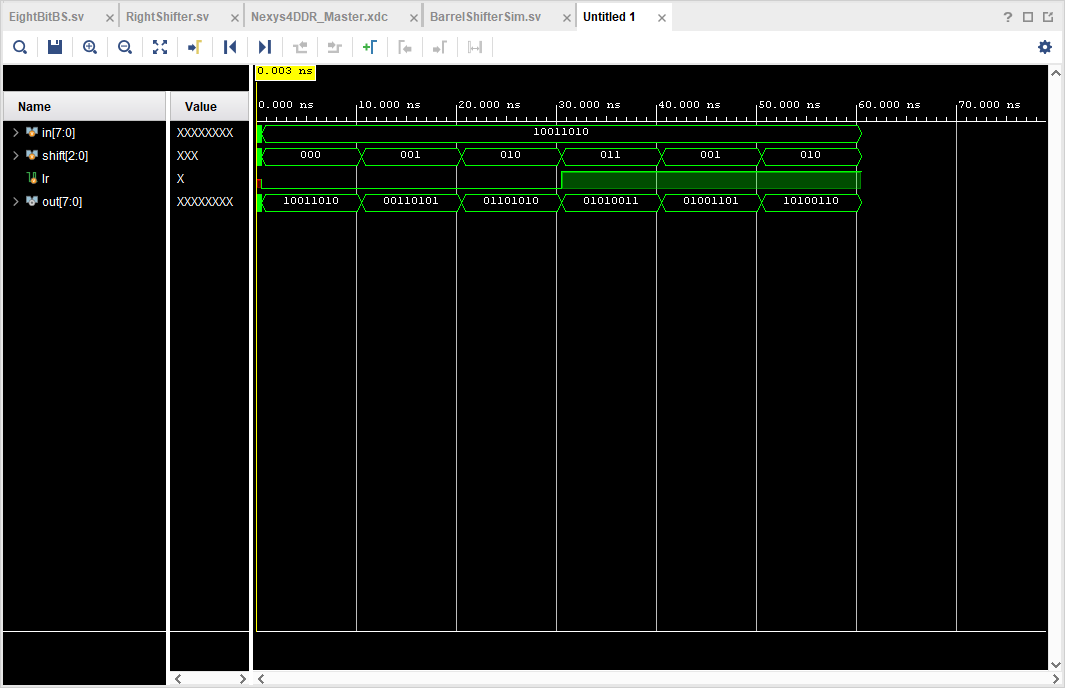
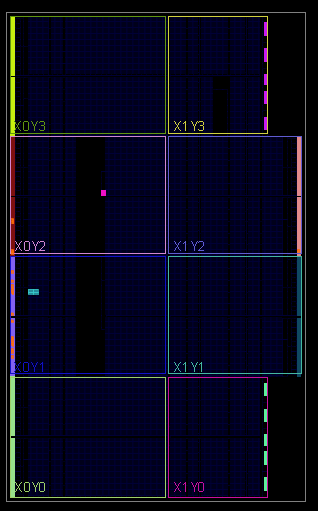
Lab 1: Barrel Shifters

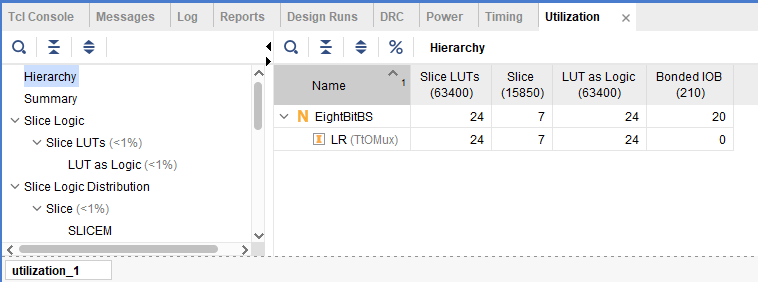
Multi-function barrel shifter

* 8-bit shifting with right- and left-rotating circuits and 2-to-1 mux
* Video demonstration: <https://streamable.com/wac634>



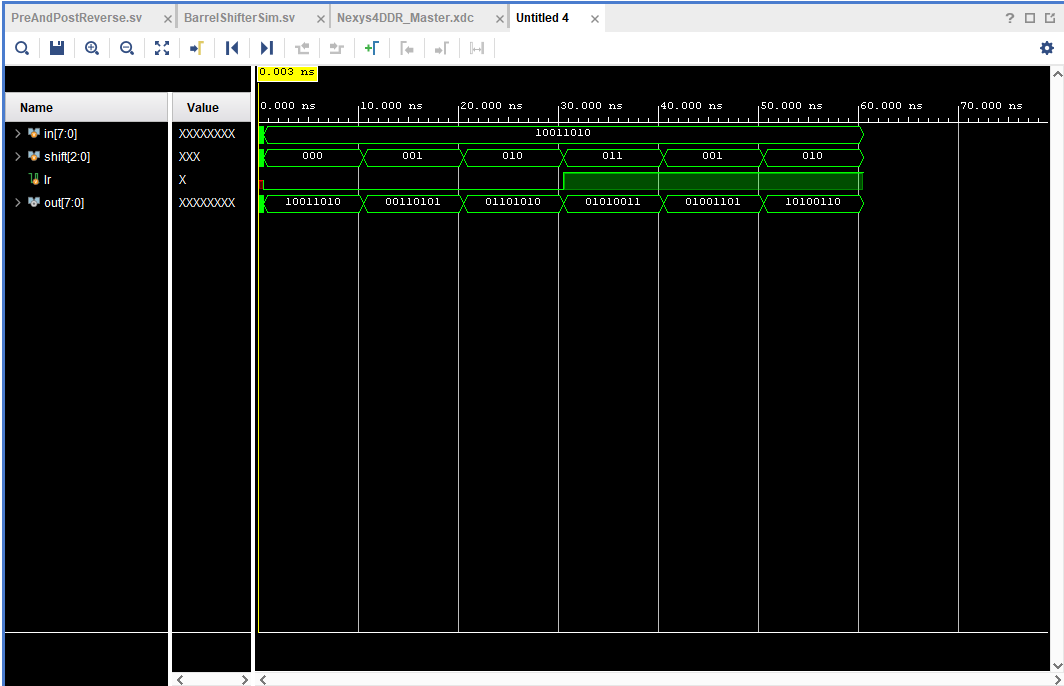
Left- and right-shift simulation result for 8-bit circuit



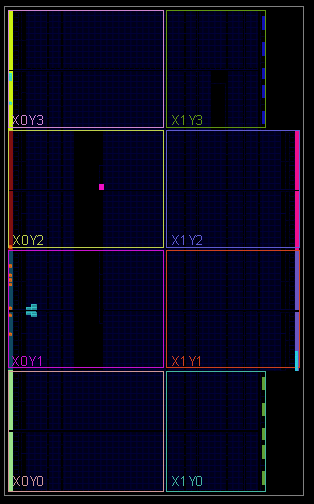


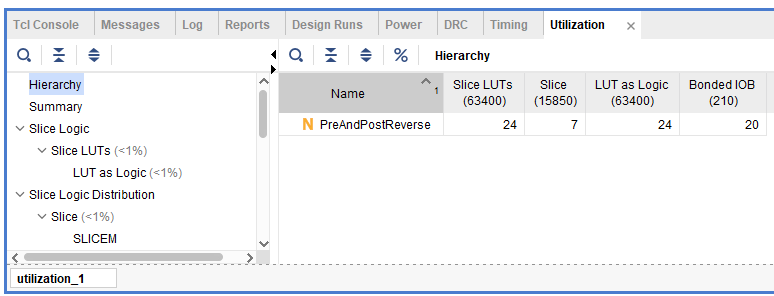
Resource utilization report upon implementation shows 24 LUTs are utilized

* 8-bit shifting with right-rotate shifter and pre/post reversing circuits



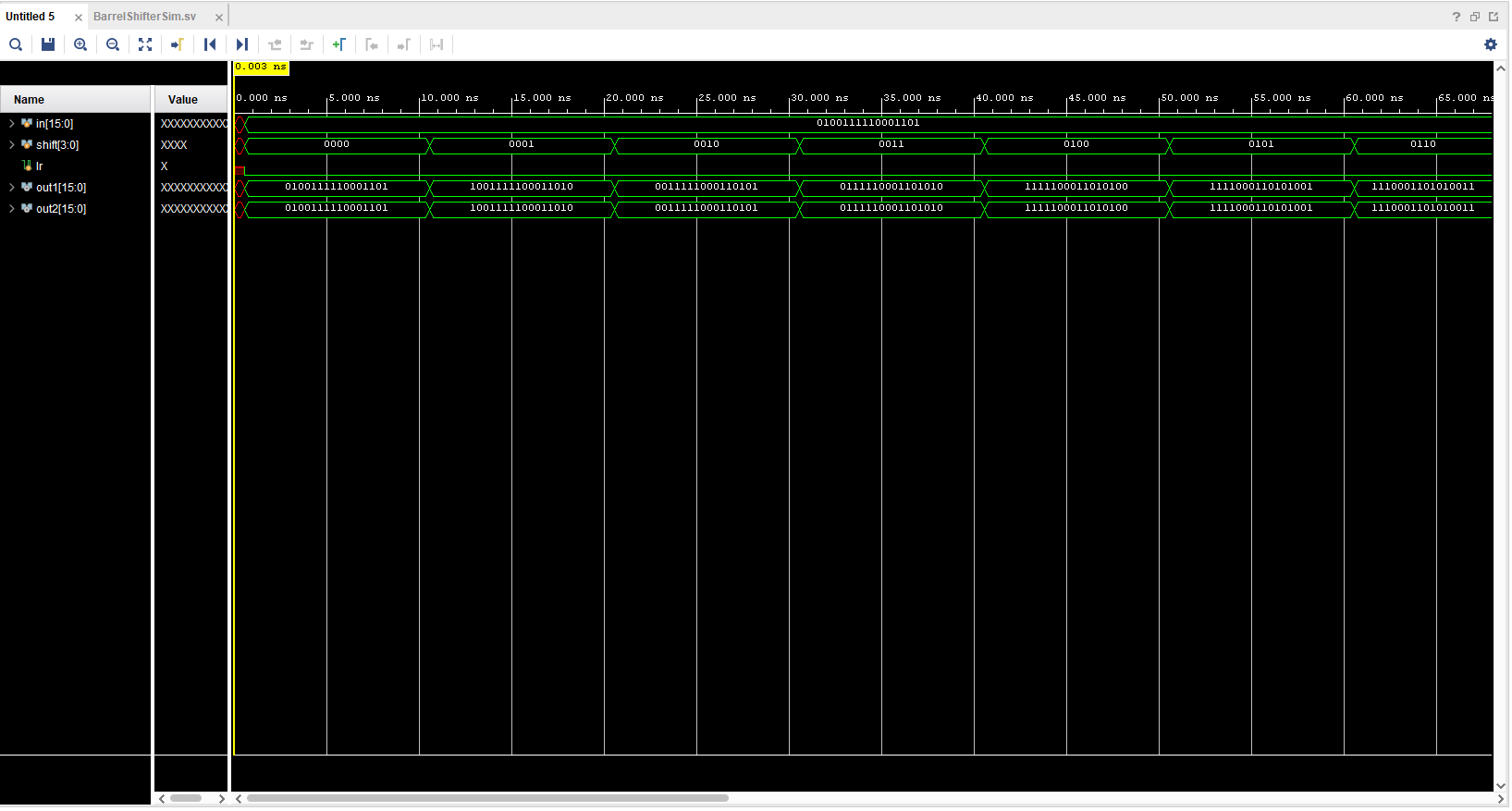
Left- and right-shift simulation result for 8-bit shift/reverse circuit



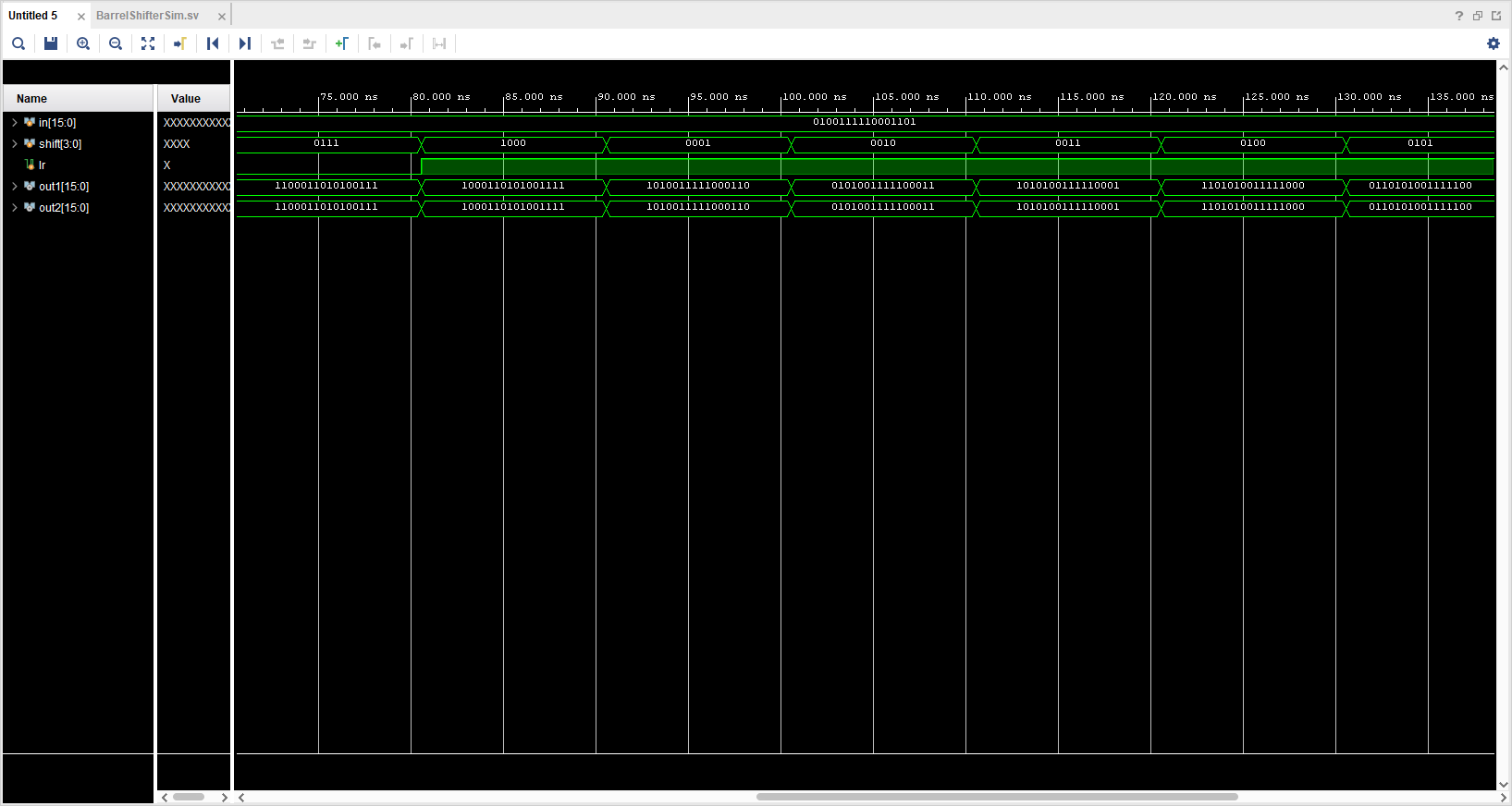


Resource utilization report upon implementation shows 24 LUTs are utilized, similar to the previous circuit implementation

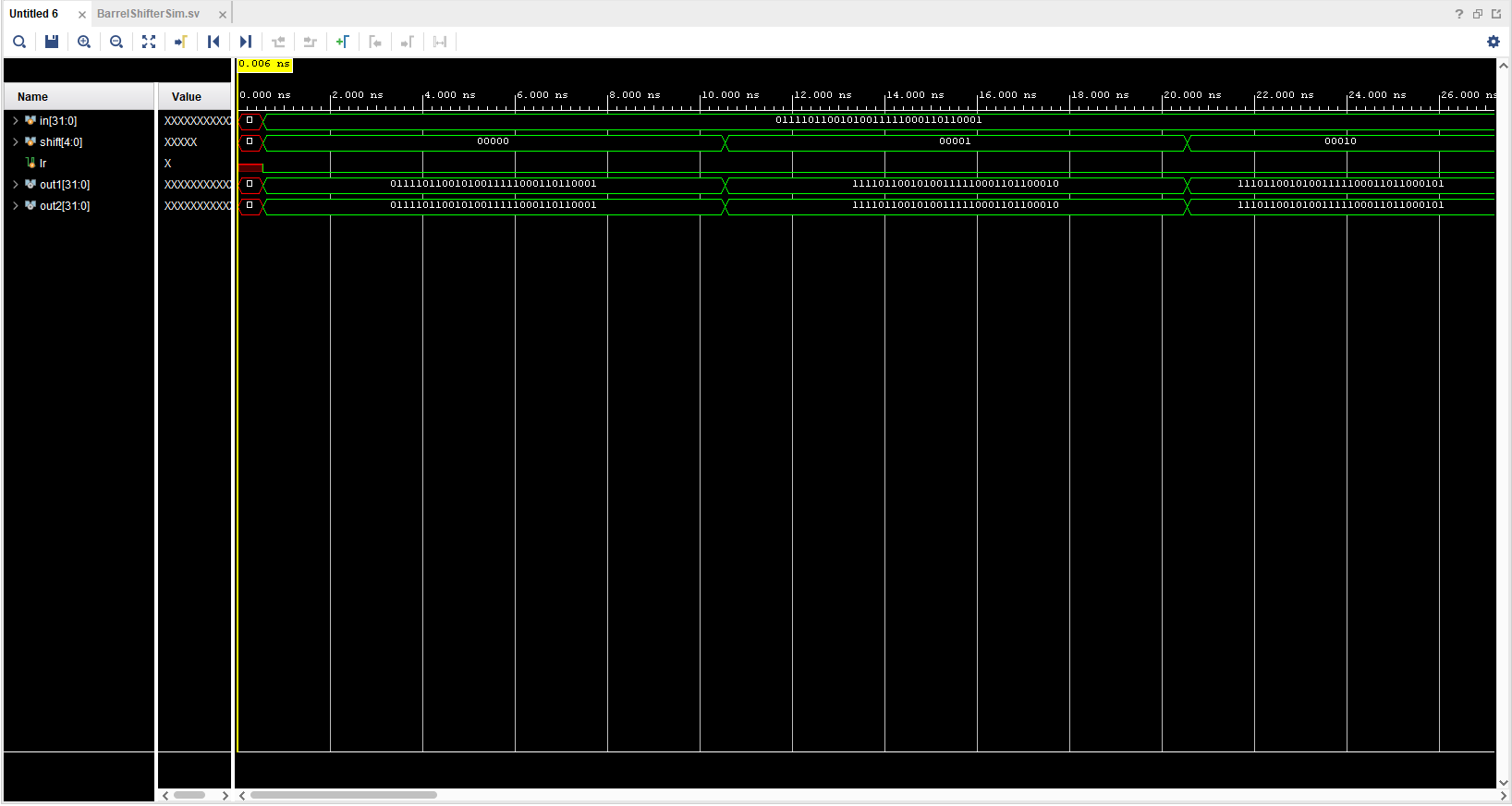
* 16-bit shifting (combined)
  + Right- and left-rotating circuits and 2-to-1 mux
  + Right-rotate shifter and pre/post reversing circuits



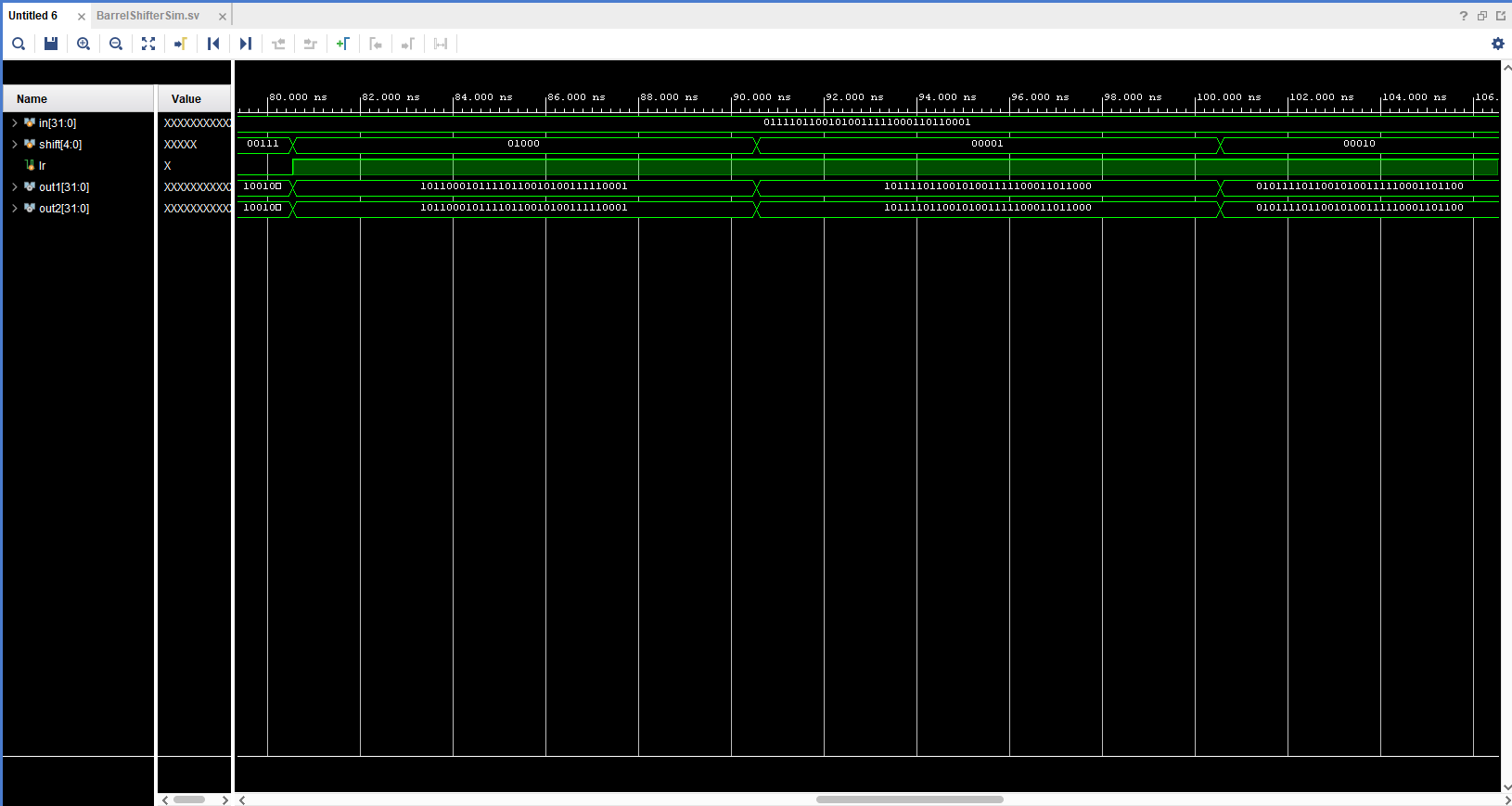
Left-shift simulation result for both 16-bit circuit implementations



* Right-shift simulation result for both 16-bit circuit implementations
* 32-bit shifting (combined)
  + Right- and left-rotating circuits and 2-to-1 mux
  + Right-rotate shifter and pre/post reversing circuits

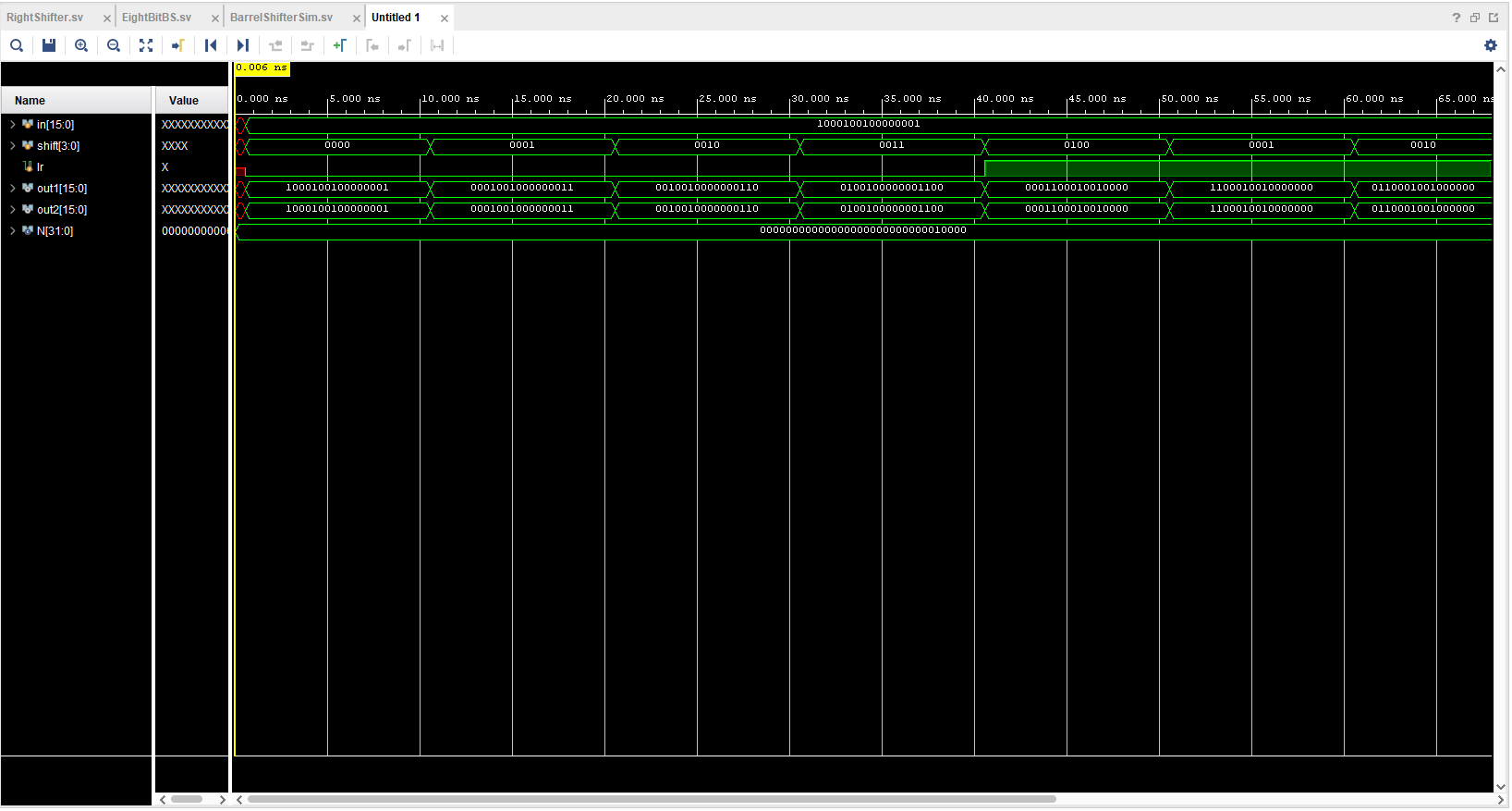


Left-shift simulation result for both 32-bit circuit implementations



Right-shift simulation result for both 32-bit circuit implementations

* Nth-bit shifting



Nth-bit shifting simulation result with parameter N set to 16