

# *DIGITAL CIRCUITS LAB*

## *EXP-4 Universal Rotator*

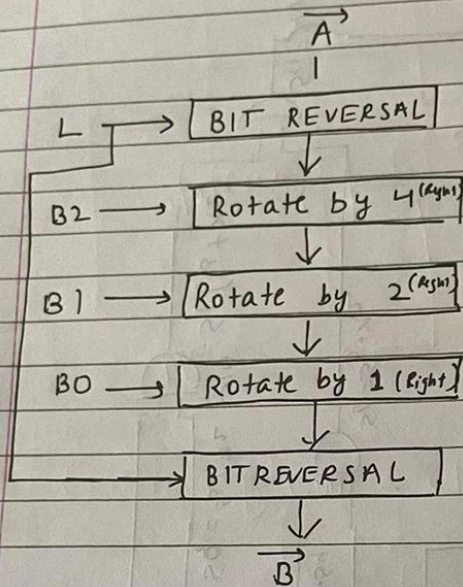
September 8, 2024

~Dev Arora  
23B1271

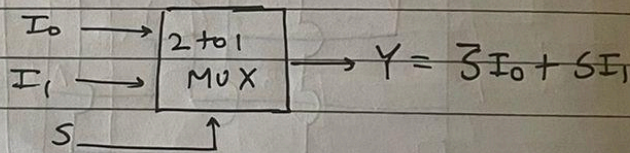
Pen-Paper Design:

5/9/24

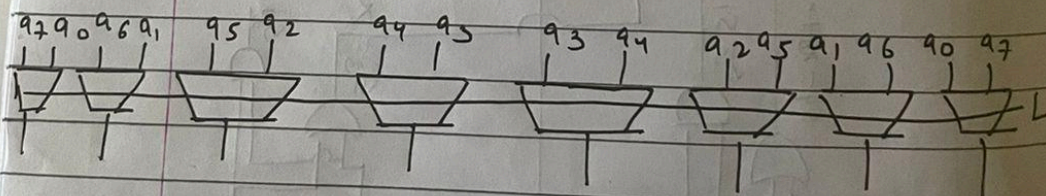
# WEEK-05 :- UNIVERSAL ROTATOR



mux:-



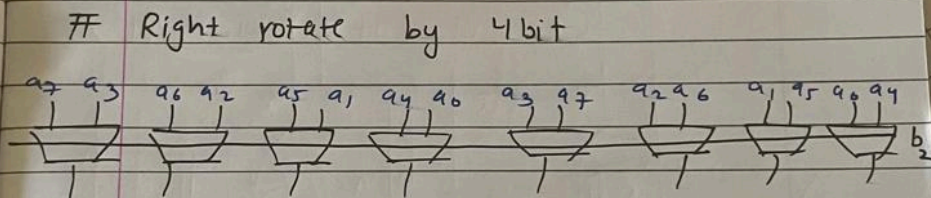
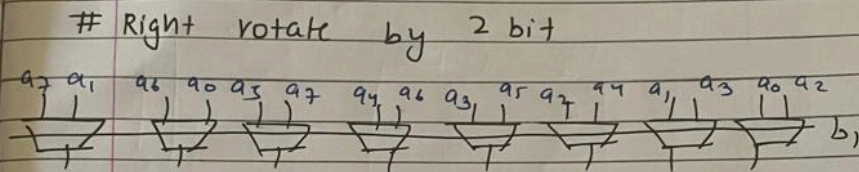
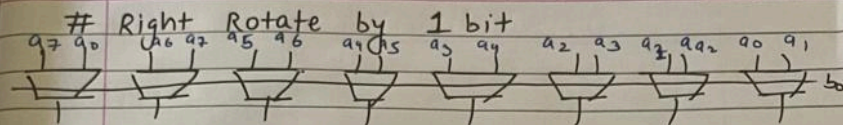
## Bit Reversal



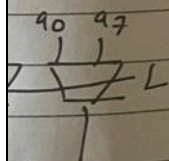
$L=0 \Rightarrow$  No bit reversal  $\Rightarrow$  Right Shift  
 $L=1 \Rightarrow$  Bit reversal  $\Rightarrow$  Left Shift



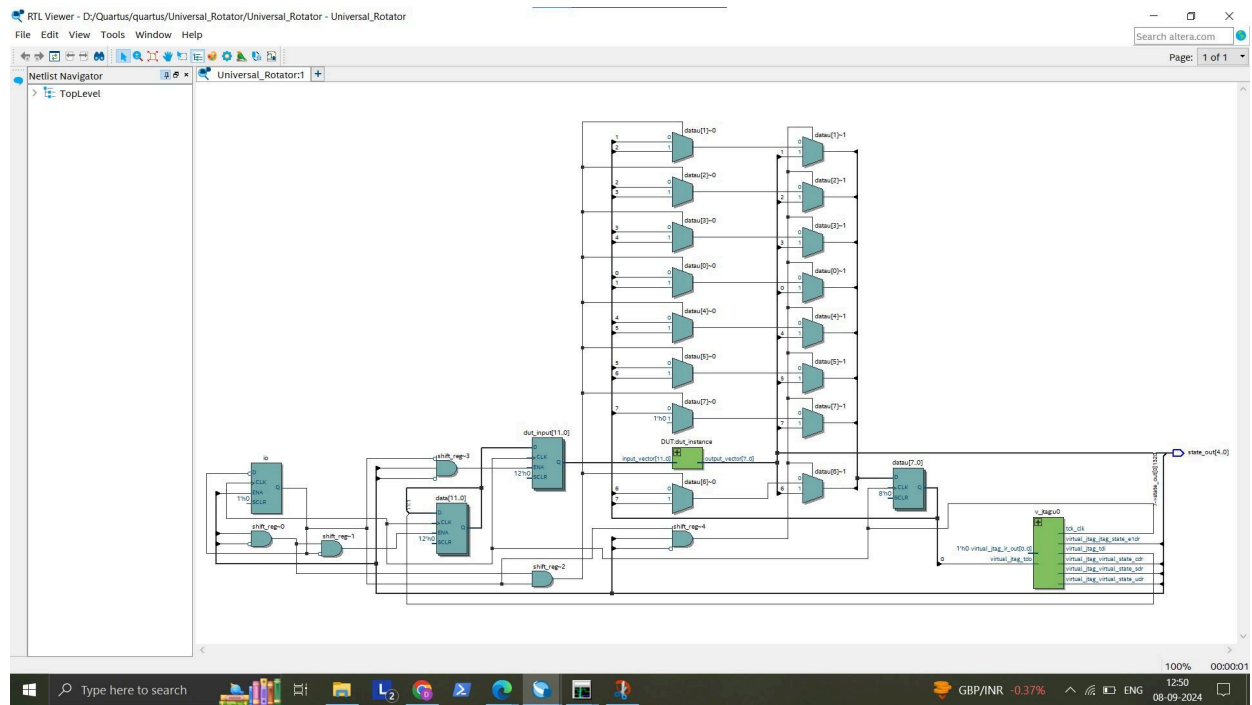
## ROTATOR

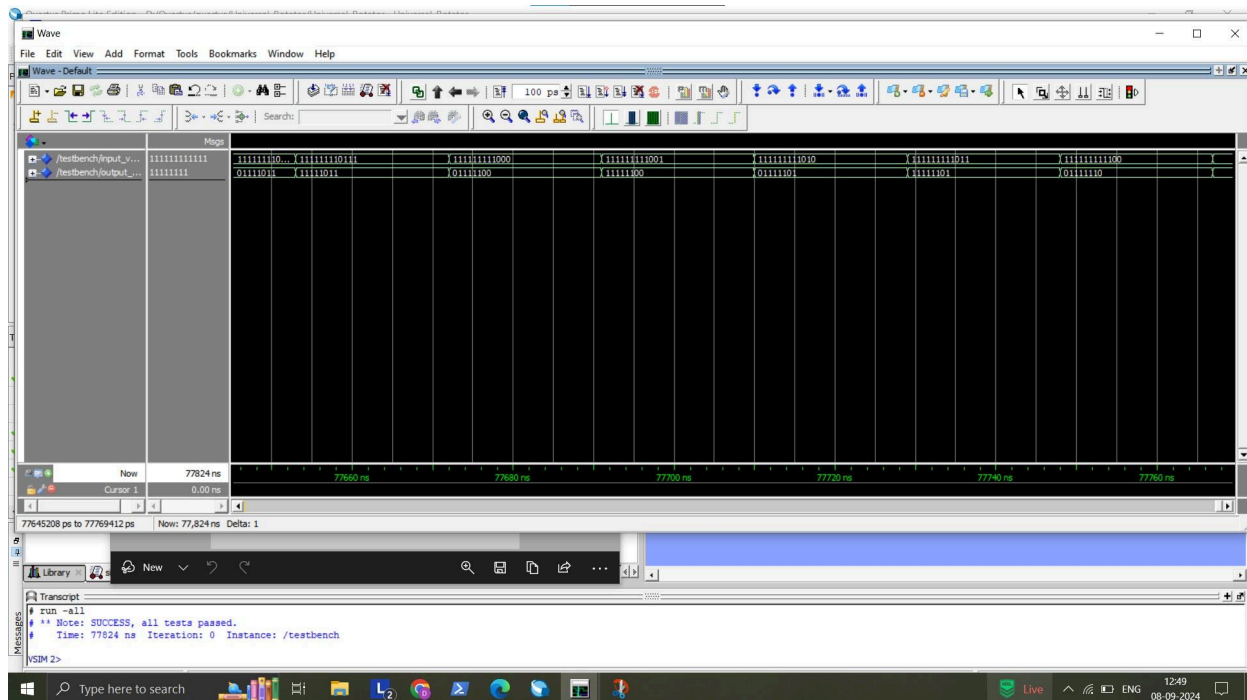


SEI



## Netlists & Simulation Wave:





## Testing Terminal:

```

jtag> cable ft2232
Connected to libftd2xx driver.
jtag>

```

```

jtag> detect
IR length: 10
Chain length: 1
Device Id: 00000011000110000100000011011101 (0x00000000031840DD)
Manufacturer: Altera
Part(0): 10M25SAE144
Stepping: 1
Filename: d:\quartus\quartus\majority_circuit\xen10_files\urjtag_max10\urjtag\data\altera\10m25sae144\10M25SAE144
jtag>

```

## ScanChain Outputs:

000000000000	00000000	Success
000000000001	00000001	Success
000000000010	00000010	Success
000000000011	00000011	Success
000000000100	00000100	Success
000000000101	00000101	Success
000000000110	00000110	Success
000000000111	00000111	Success
000000001000	00001000	Success
000000001001	00001001	Success
000000001010	00001010	Success
000000001011	00001011	Success
000000001100	00001100	Success
000000001101	00001101	Success
000000001110	00001110	Success
000000001111	00001111	Success
000000010000	00010000	Success
000000010001	00010001	Success
000000010010	00010010	Success
000000010011	00010011	Success
000000010100	00010100	Success