

ASSIGNMENT 3

GROUP - 50

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BOARD SPECIFICATIONS

Board: Nexys 4 DDR; FPGA: Artix-7 (XC7A100TCSG324-1)

1. Combinational Unsigned Binary Multiplier (Array Multiplier) :

1. HARDWARE REQUIREMENTS:

Resource	Utilization	Available	Utilization %
LUT	44	63400	0.07
IO	24	210	11.43

2. CRITICAL PATH DELAY: 11.426 ns

2. Sequential Unsigned Binary Multiplier (left-shift version):

1. HARDWARE REQUIREMENTS:

Resource	Utilization	Available	Utilization %
LUT	38	63400	0.06
FF	47	126800	0.04
IO	27	210	12.86

2. CRITICAL PATH DELAY: 4.090 ns

3. Sequential Unsigned Binary Multiplier (right-shift version):

1. HARDWARE REQUIREMENTS:

Resource	Utilization	Available	Utilization %
LUT	27	63400	0.04
FF	42	126800	0.03
IO	27	210	12.86

2. CRITICAL PATH DELAY: 4.090 ns

Speed of operation is inversely proportional to the critical path delay. Combinational Unsigned Binary Multiplier (Array Multiplier) is the slowest due to the wait for carry to move from the evaluation of the last bit of product to the first (MSB) bit of product result. Other two have nearly the same speed of operation.