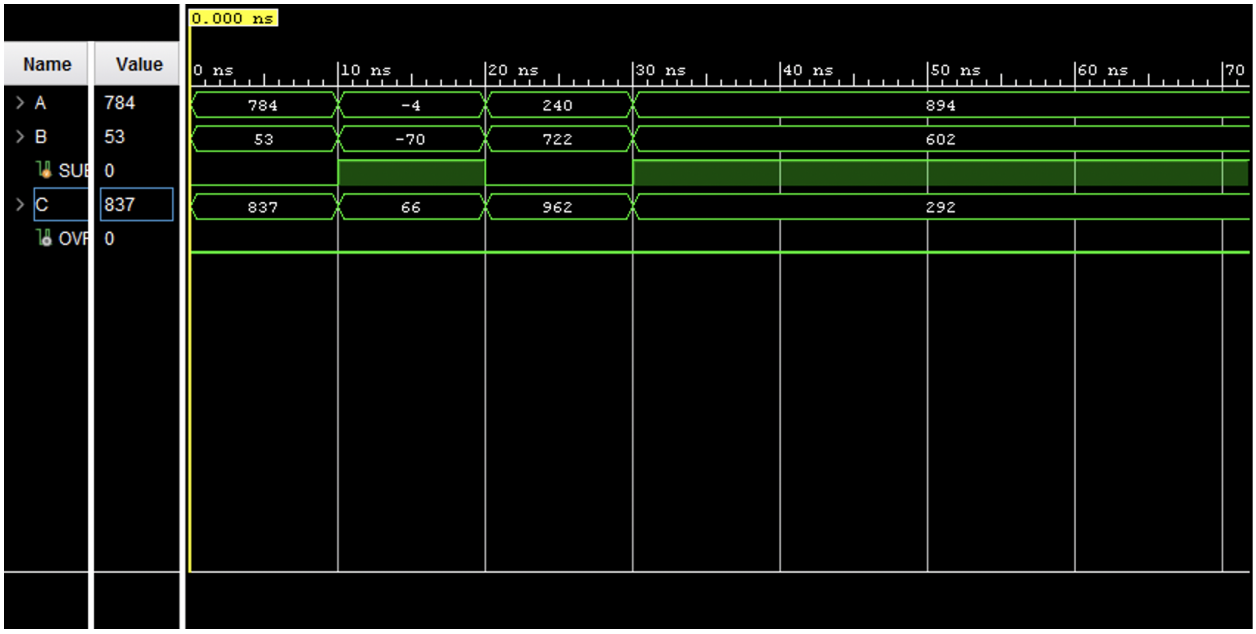
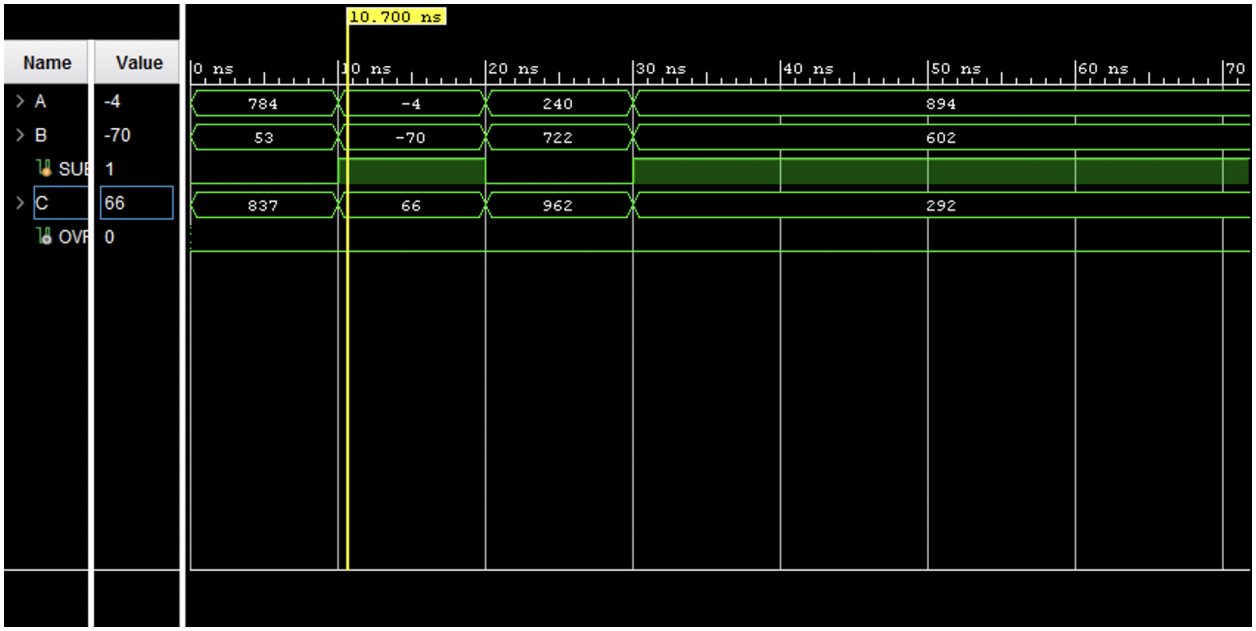
Ece Karasu - 29467

1- 16-bit ripple-carry adder-subtractor using full adders

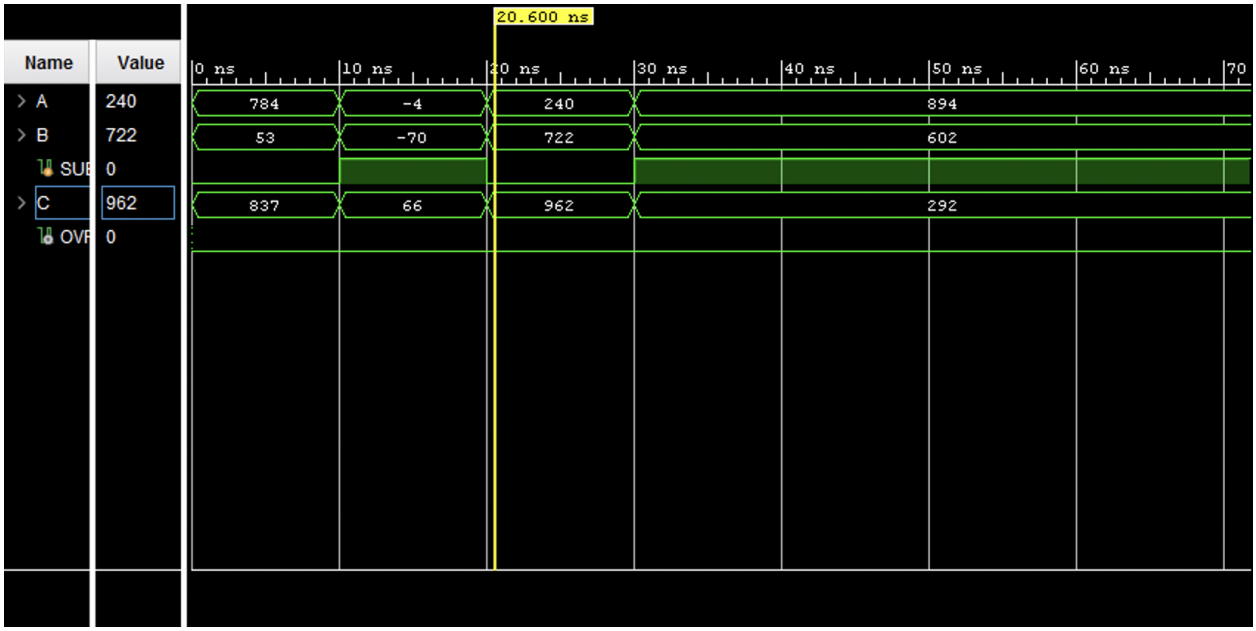
Test Case 1 - Input A: 784, Input B: 53, Operation: Addition



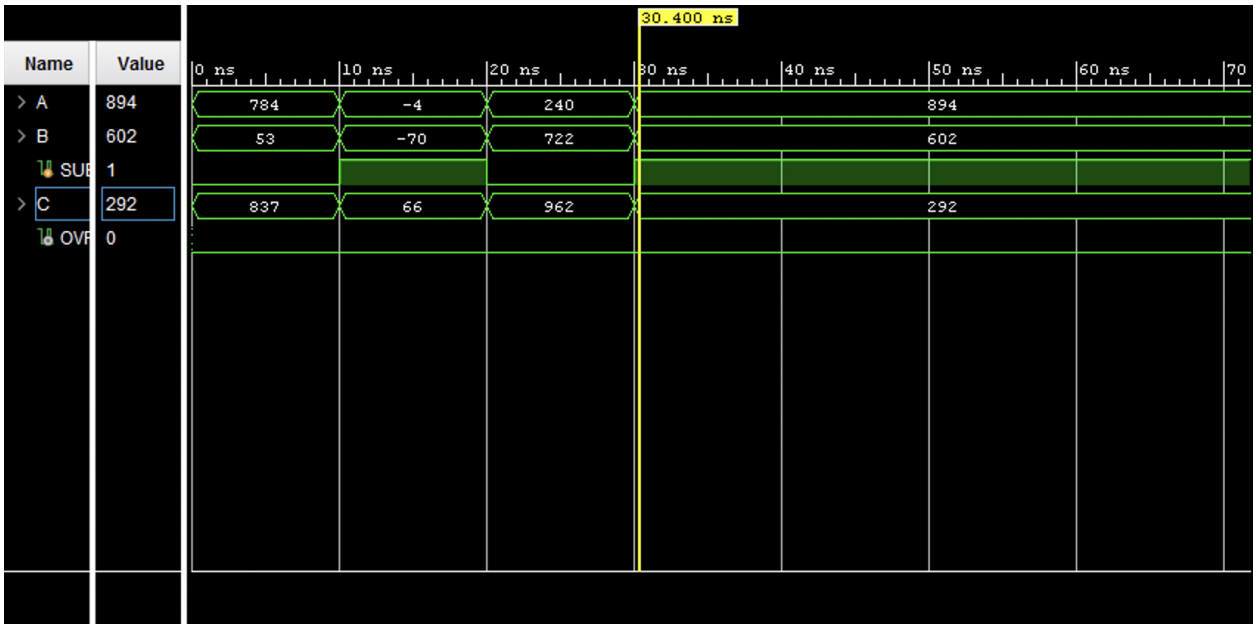
Test Case 2 - Input A: -4, Input B: -70, Operation: Subtraction



Test Case 3 - Input A: 240, Input B: 722, Operation: Addition



Test Case 4 - Input A: 894, Input B: 602, Operation: Subtraction



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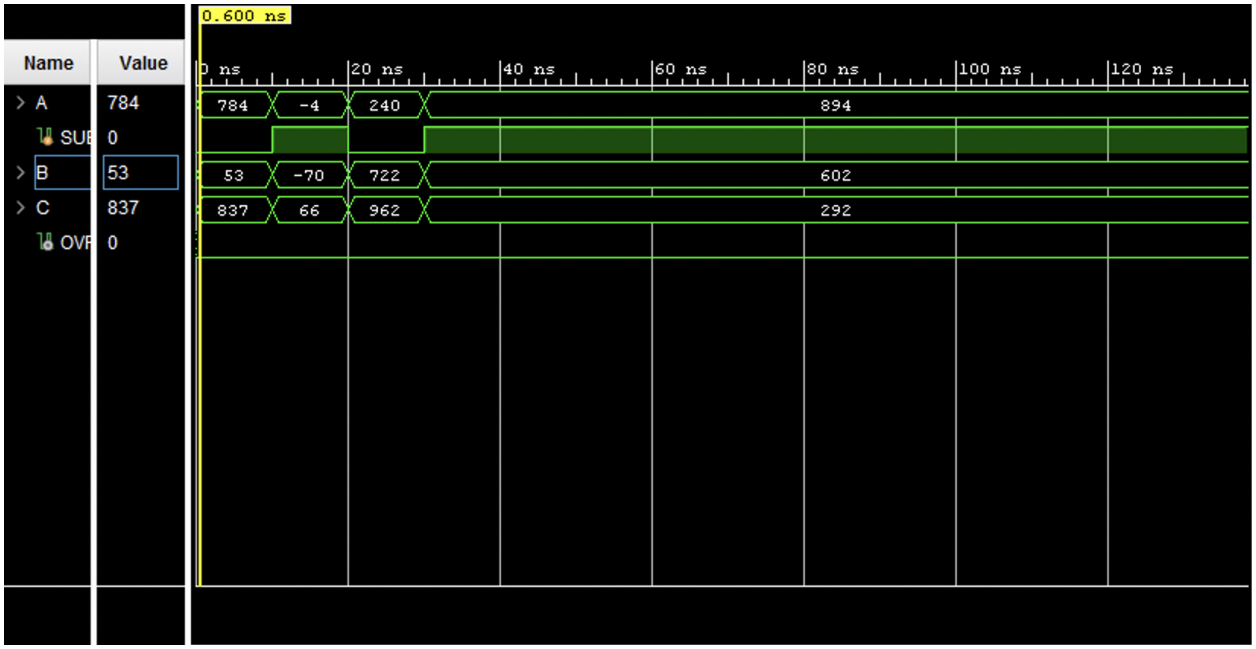
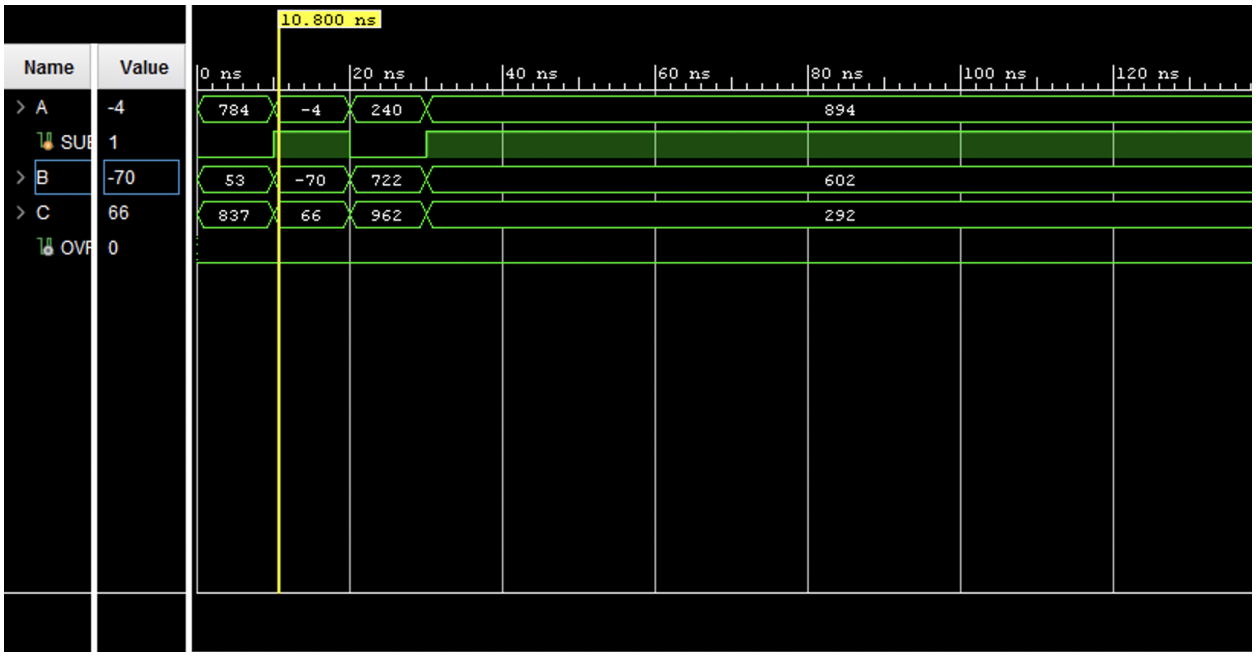
2- 16-bit hybrid adder-subtractor using 4-bit carry lookahead adders

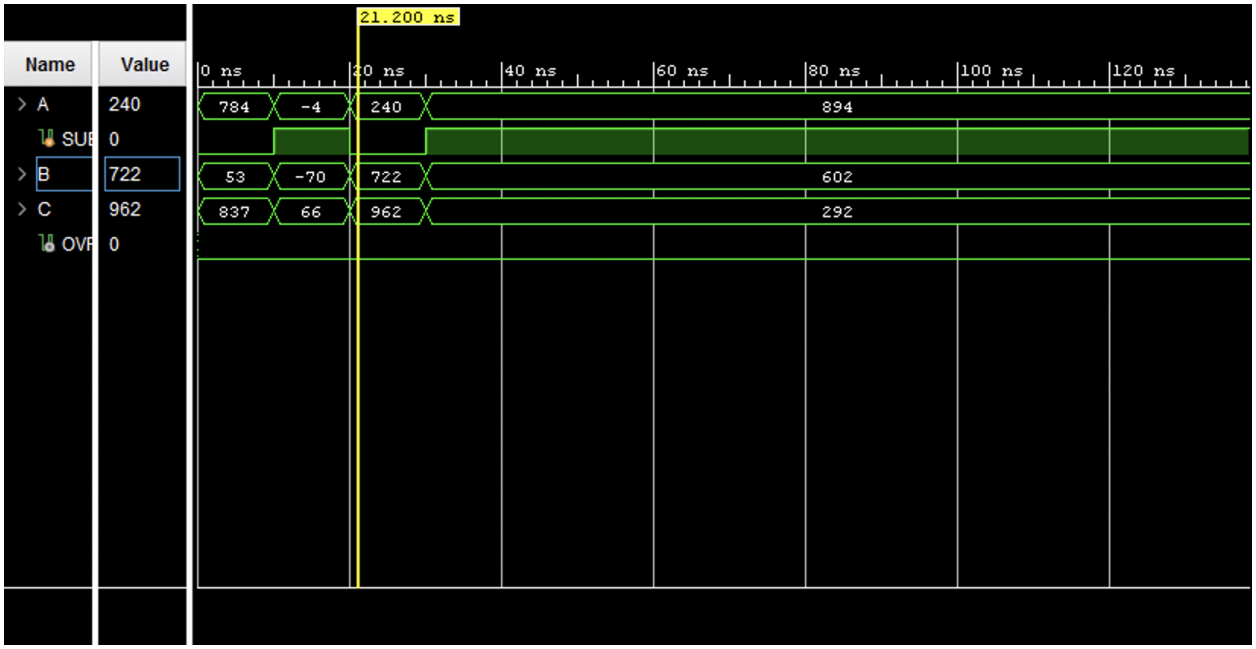
Test Case 1 - Input A: 784, Input B: 53, Operation: Addition



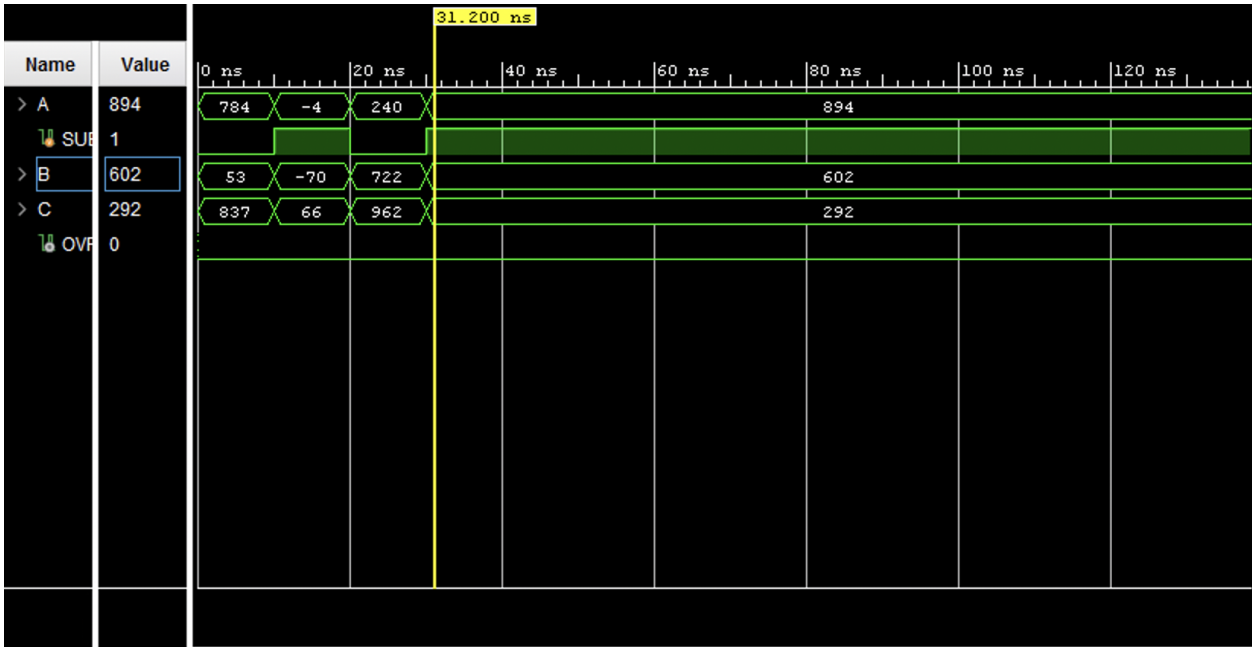
Test Case 2 - Input A: -4, Input B: -70, Operation: Subtraction



Test Case 3 - Input A: 240, Input B: 722, Operation: Addition



Test Case 4 - Input A: 894, Input B: 602, Operation: Subtraction



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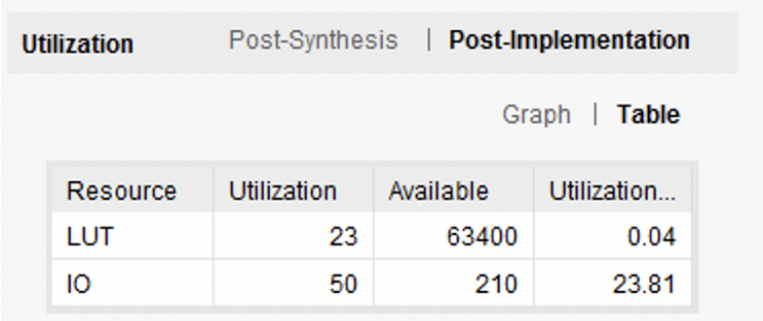
1. Which one of the two is better in terms of area?

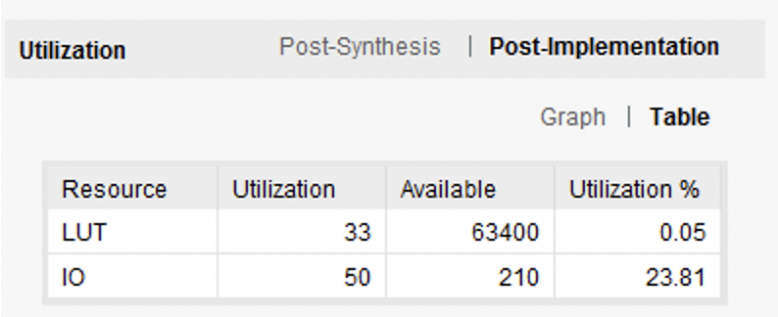
From the results, it is seen that while ripple-carry adder-subtractors are using 23 LUT's, CLA's are using 33. So, ripple-carry adder-subtractor is better in terms of area.

Implementation results of ripple-carry adder-subtractors



Resource	Utilization	Available	Utilization...
LUT	23	63400	0.04
IO	50	210	23.81

Implementation results of CLA's



Resource	Utilization	Available	Utilization %
LUT	33	63400	0.05
IO	50	210	23.81

2. Which one of the two is better in terms of time?

Since CLA's have more complex structures with more area used they consume more time. So, ripple-carry adder-subtractor is better in terms of time.