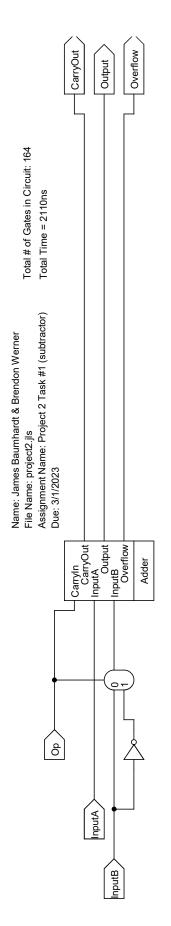
00000000 0 15-1 Total # of Gates in Circuit: 367 Total Time = 4895 ns InputA LessThan InputB Signed Comparator 7-0 V 15-0 T 15-0 T 15-0 T Total # of Gates in Add/Sub: 164
Total Time = 2110ns 8288888 - 88522 22 Output CarryOut Overflow Adder_Subtractor Name: James Baumhardt & Brendon Werner File Name: ALU_16bit, starter Assignment Name: Project 3: Build an ALU Assignment Due Date: 3/22/2023 \equiv InputA InputB ô addu - 0000 slt-1111 9-08488680° AND, OR, NOT, XOR ALU_16bit_starter InputA 8 addu: 0
subu: 1
and: 2
or: 3
or: 4
xor: 5
uui: 6
sluu: 7
add: 8
sub: 9
slt: 15

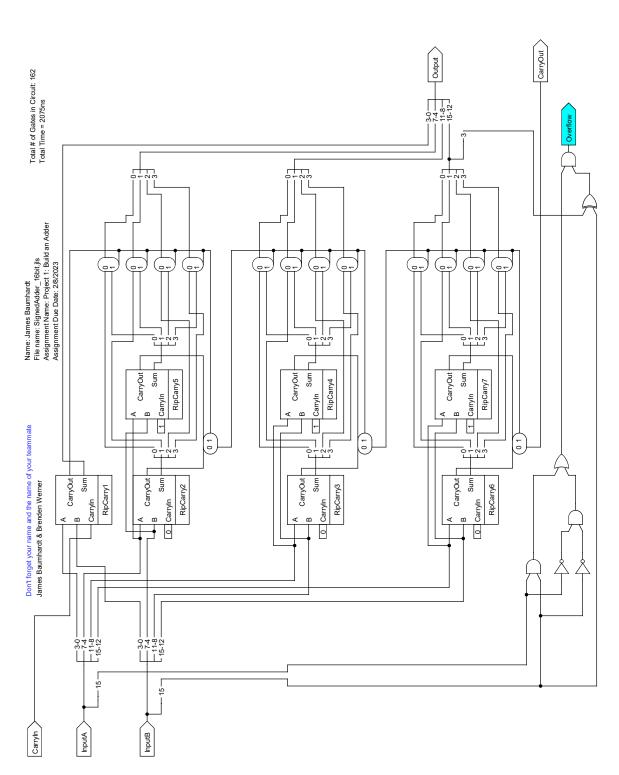
Overflow

Output

Adder_Subtractor in ALU_16bit_starter



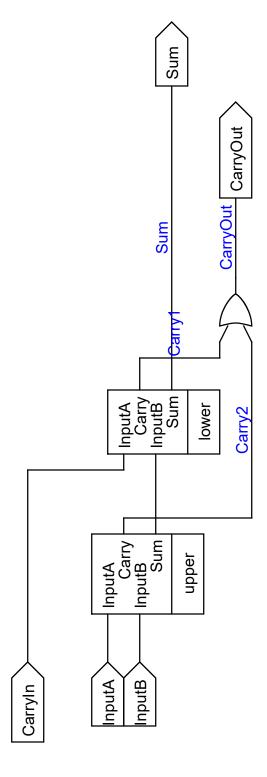
Adder in Adder_Subtractor in ALU_16bit_starter



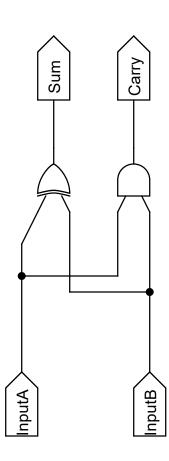
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry2 in Adder in Adder_Subtractor in ALU_16bit_starter

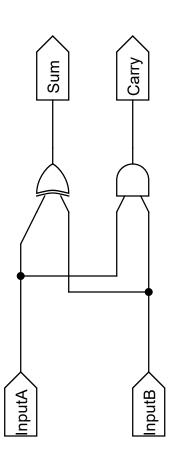
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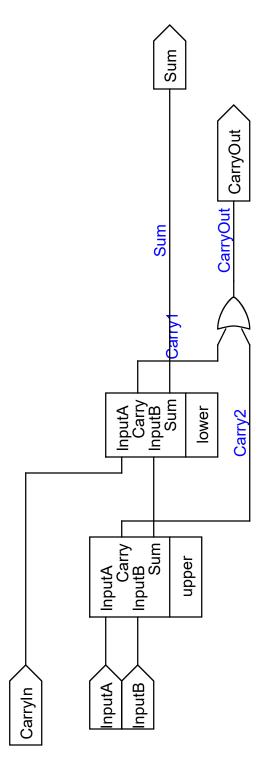
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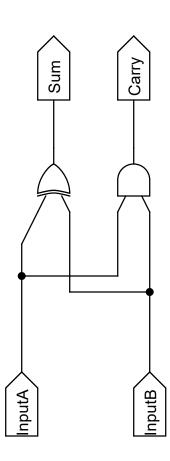
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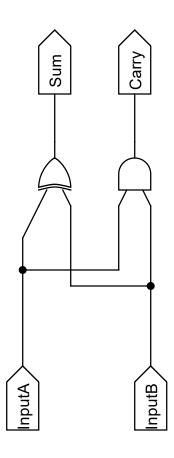
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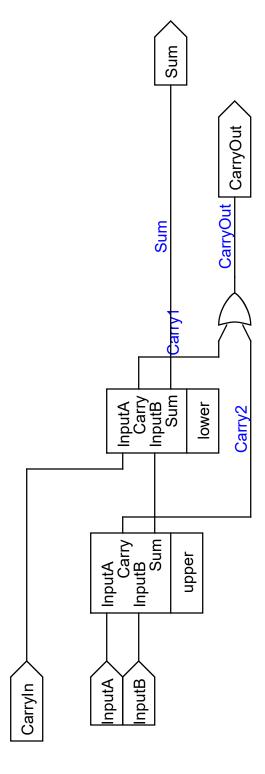
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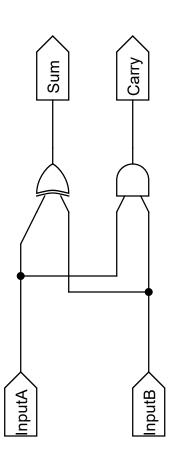
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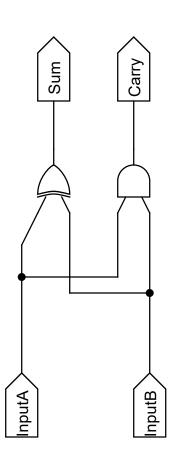
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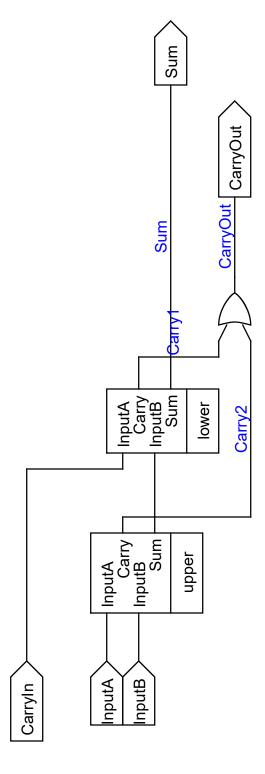
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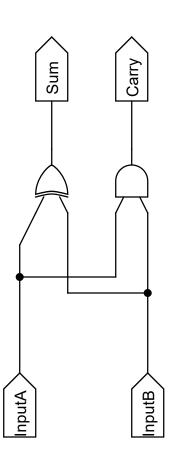
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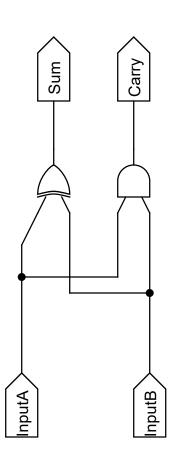
Adder_2 in RipCarry2 in Adder in Adder_Subtractor in ALU_16bit_starter



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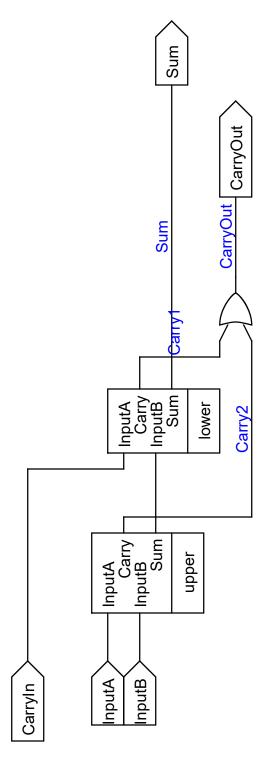
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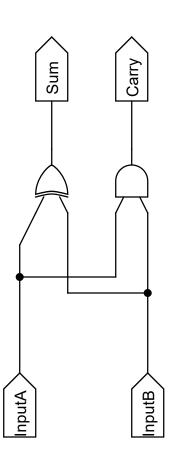
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry5 in Adder in Adder_Subtractor in ALU_16bit_starter

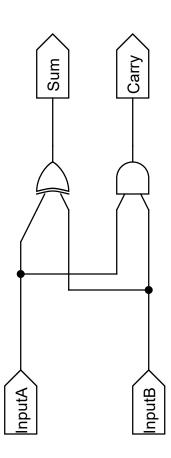
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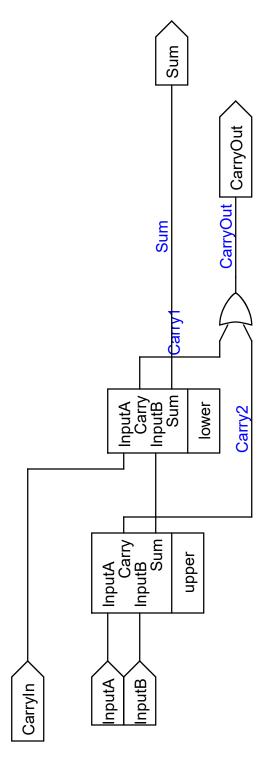
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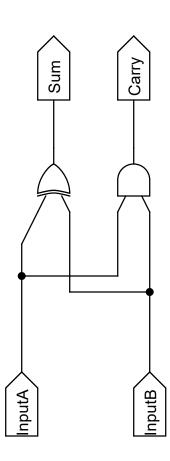
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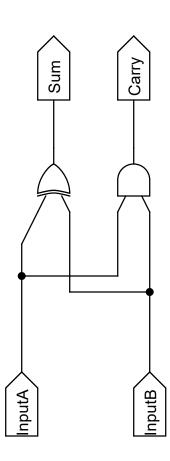
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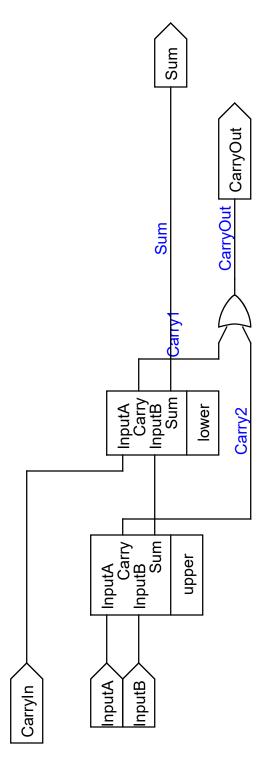
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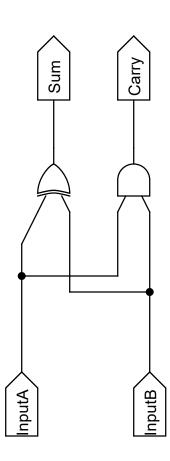
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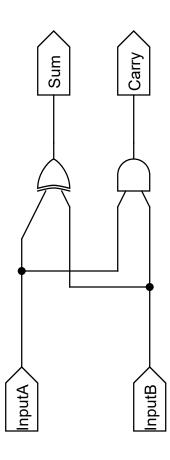
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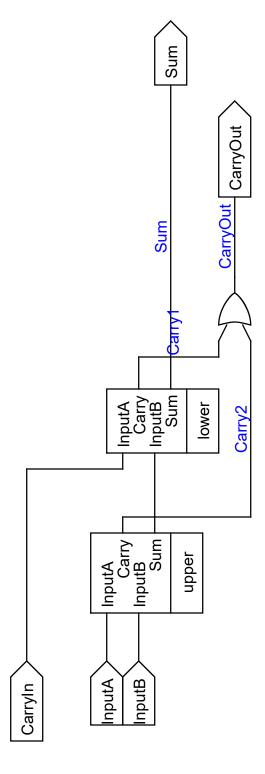
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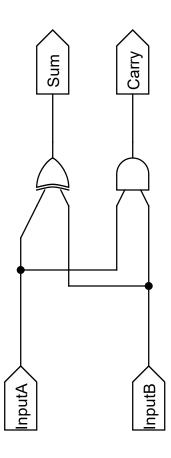
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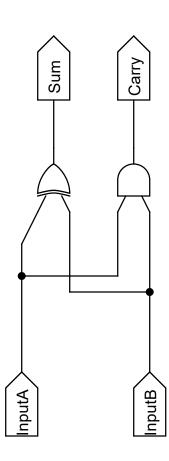
Adder_2 in RipCarry5 in Adder in Adder_Subtractor in ALU_16bit_starter



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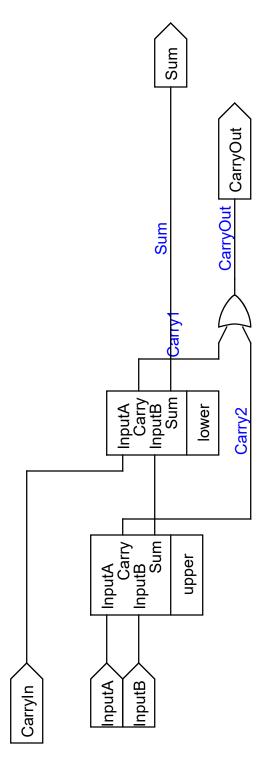
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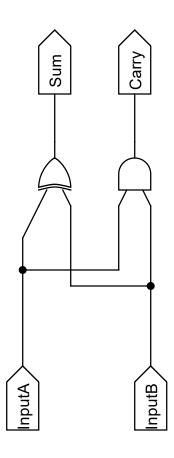
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry7 in Adder in Adder_Subtractor in ALU_16bit_starter

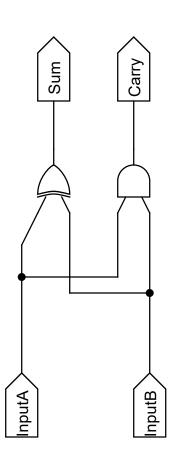
Adder_2 in RipCarry7 in Adder in Adder_Subtractor in ALU_16bit_starter



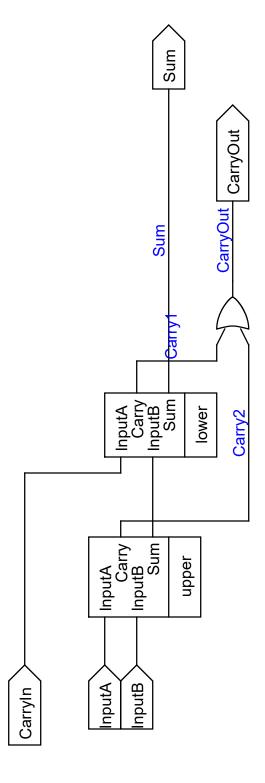
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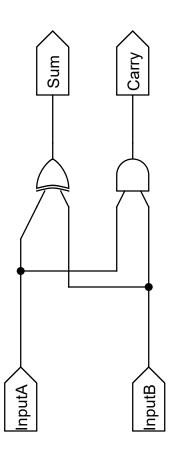
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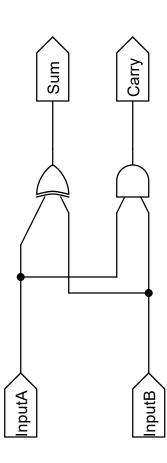
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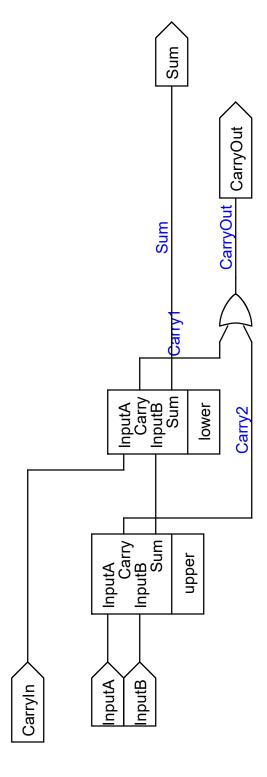
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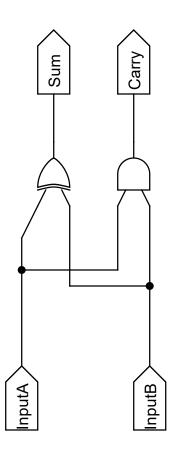
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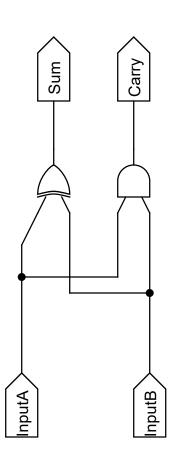
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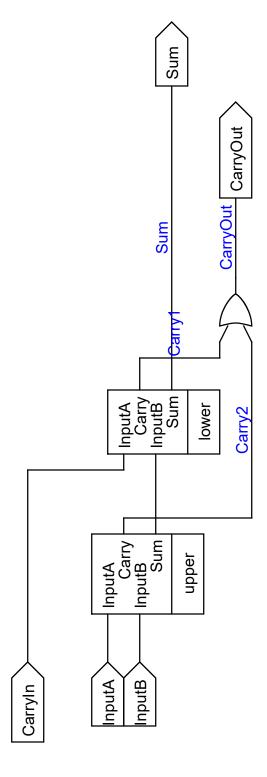
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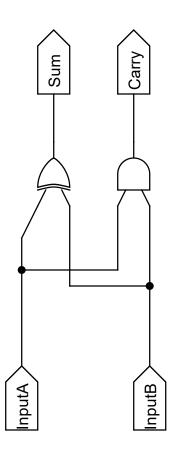
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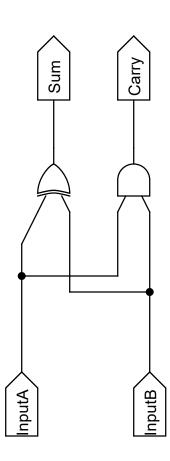
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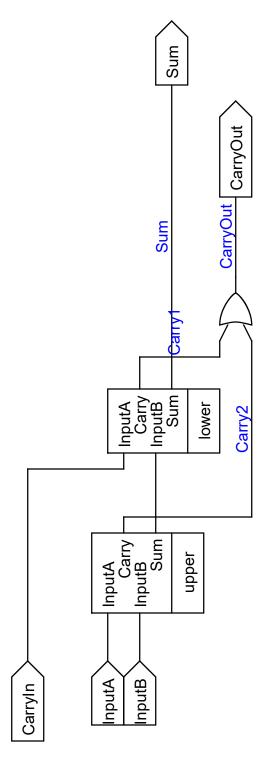
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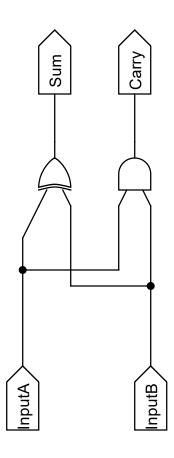
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry4 in Adder in Adder_Subtractor in ALU_16bit_starter

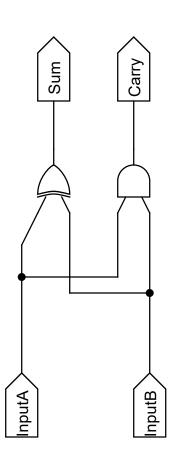
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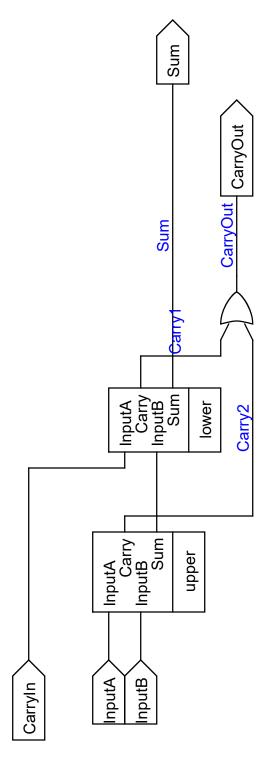
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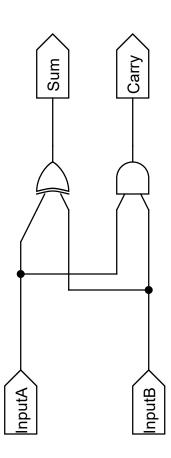
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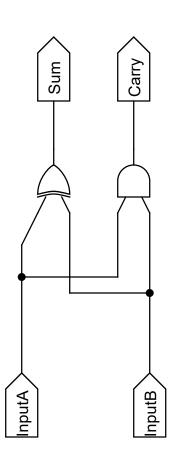
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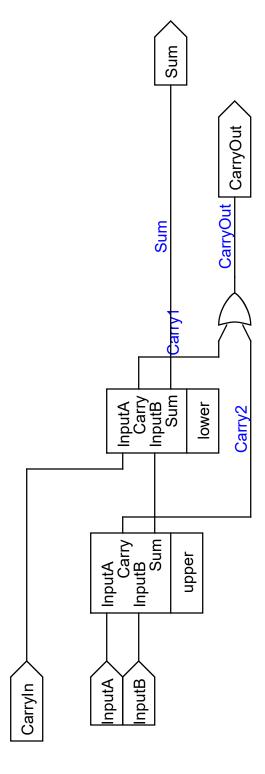
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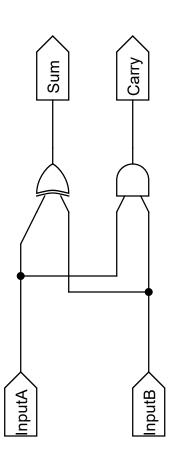
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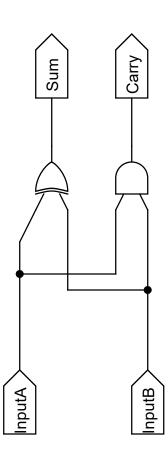
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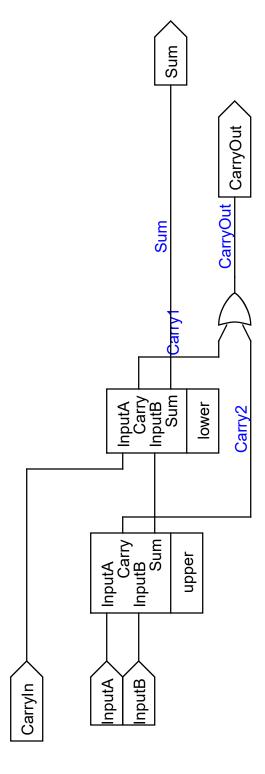
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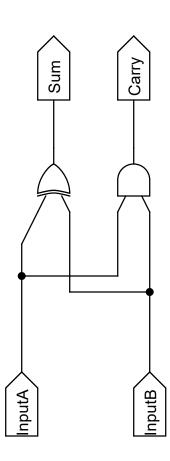
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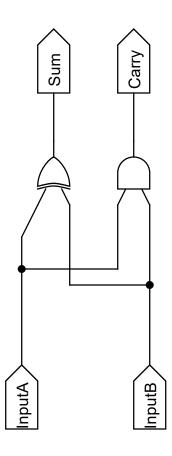
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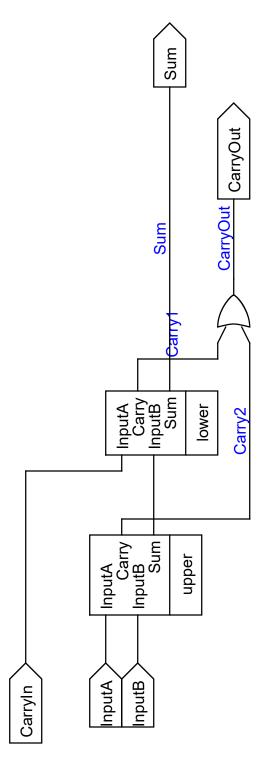
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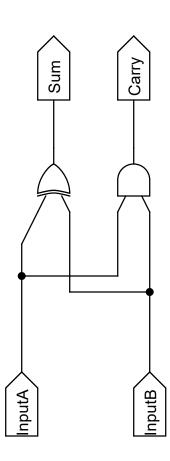
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry6 in Adder in Adder_Subtractor in ALU_16bit_starter

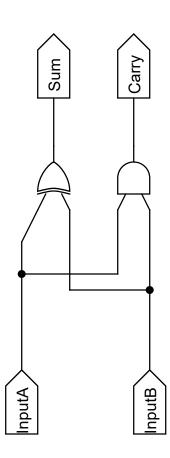
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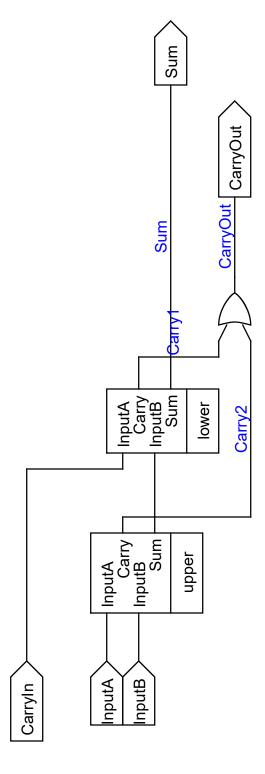
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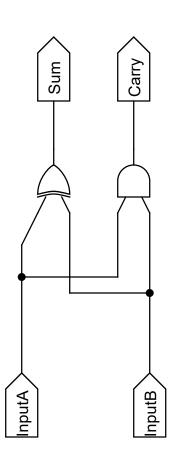
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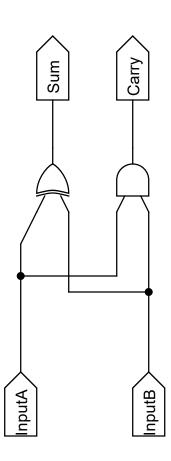
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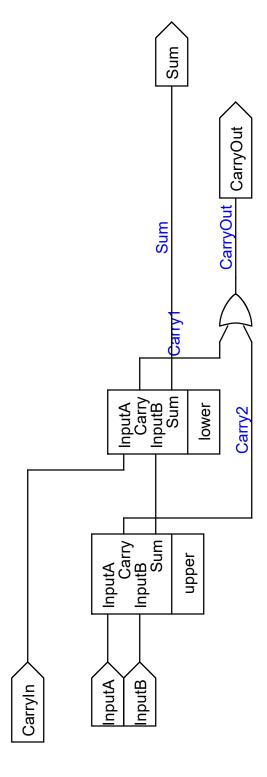
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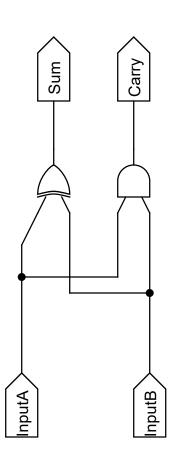
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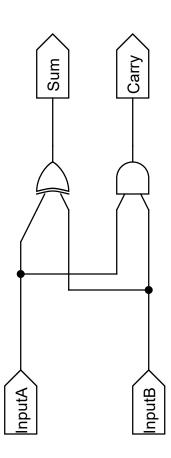
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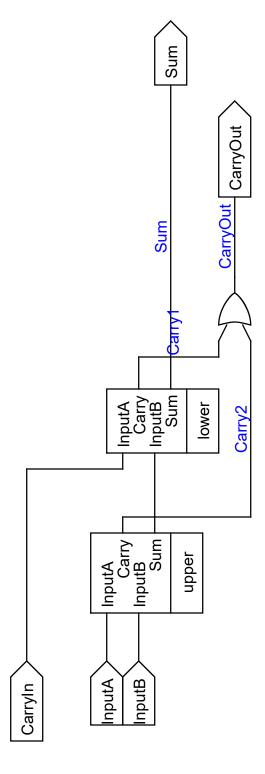
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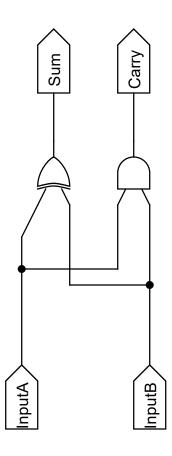
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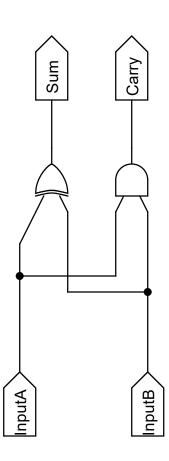
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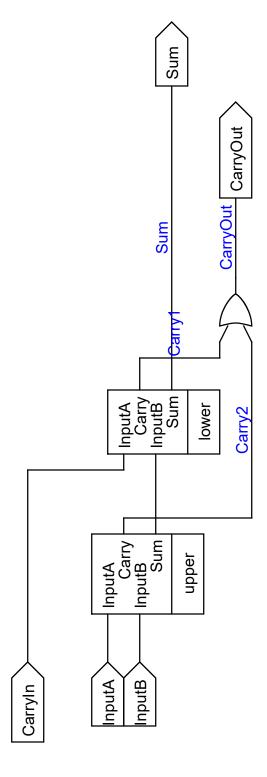
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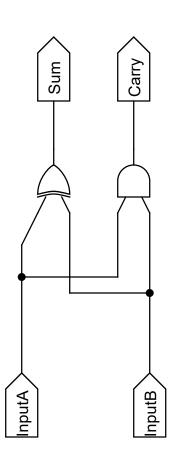
CarryOut CarryIn CarryOut – InputA Sum – InputB Adder_4 Carryln
CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry1 in Adder in Adder_Subtractor in ALU_16bit_starter

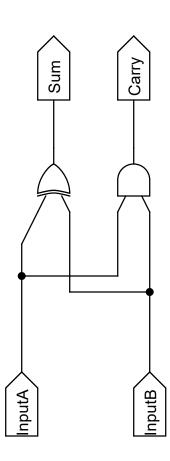
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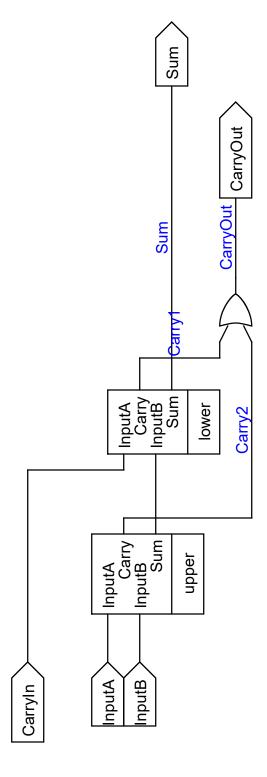
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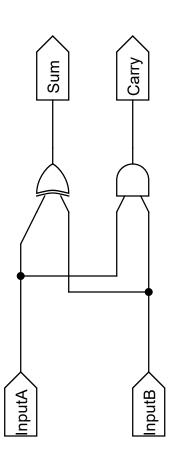
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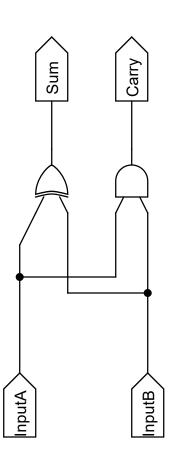
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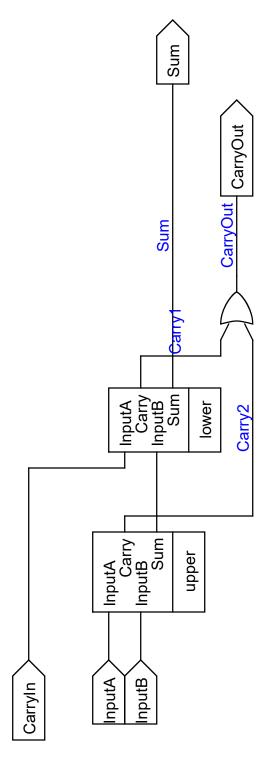
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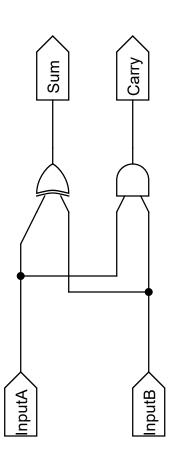
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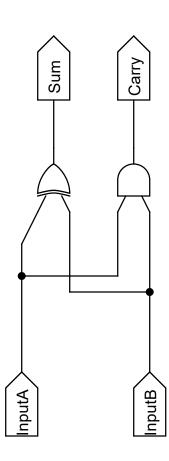
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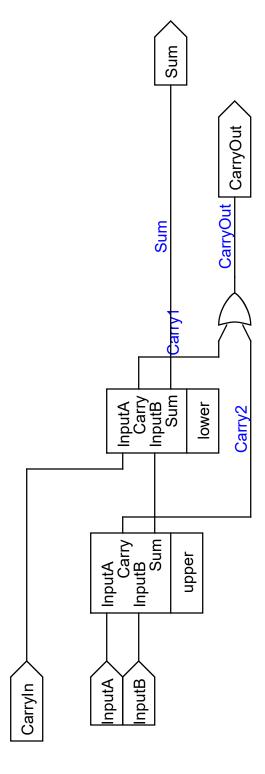
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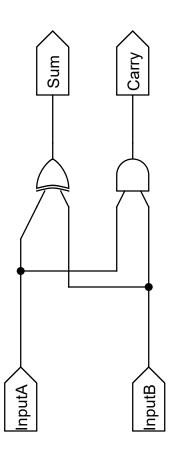
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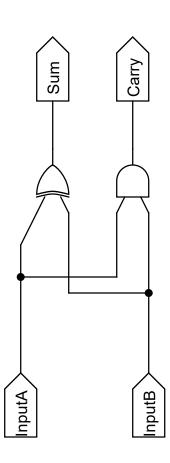
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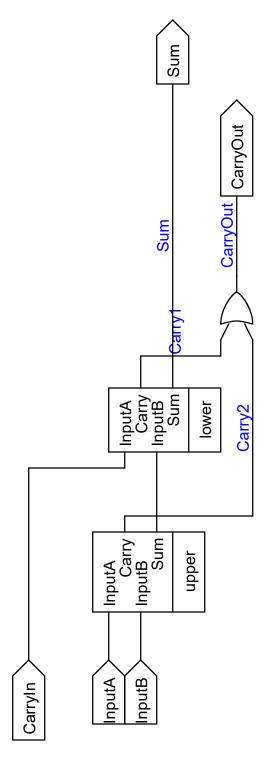
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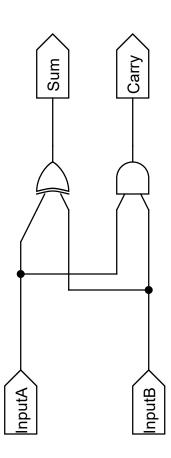
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 CarryIn CarryOut — InputA Sum — InputB Adder_1 Carryln

RipCarry3 in Adder in Adder_Subtractor in ALU_16bit_starter

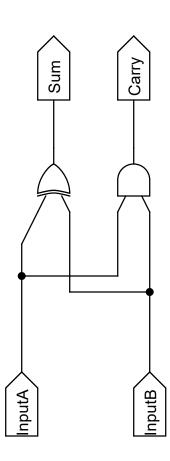
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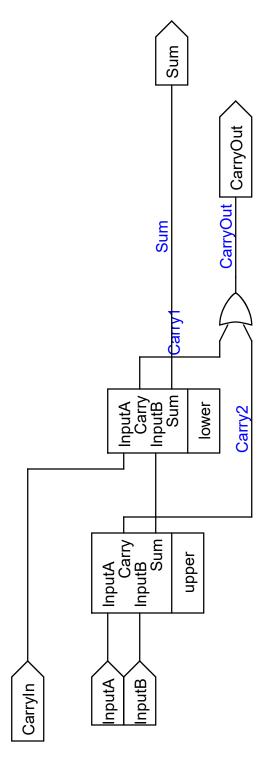
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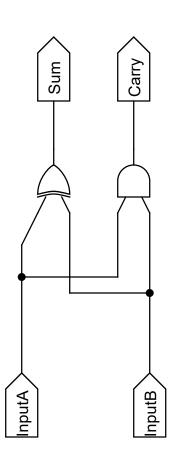
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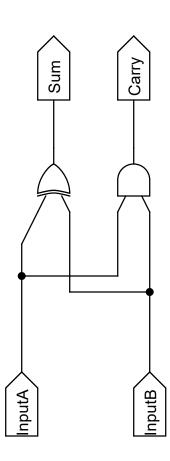
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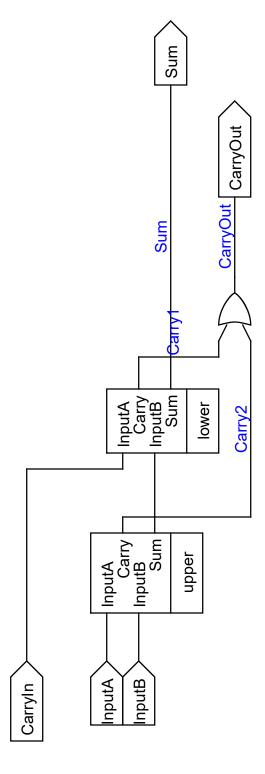
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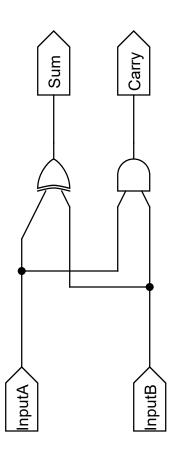
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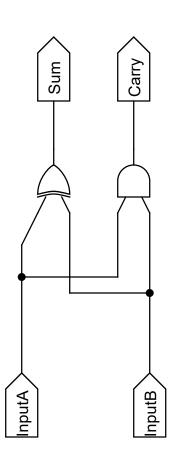
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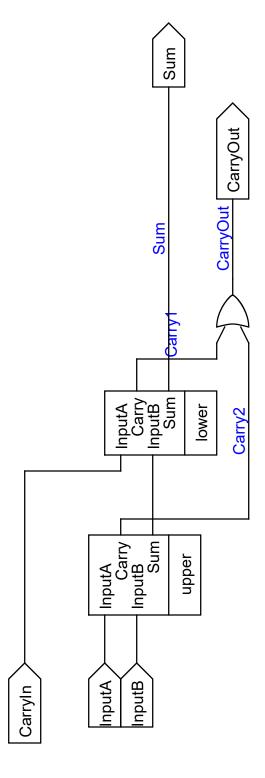
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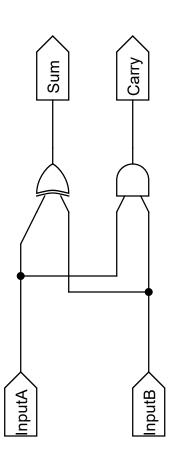
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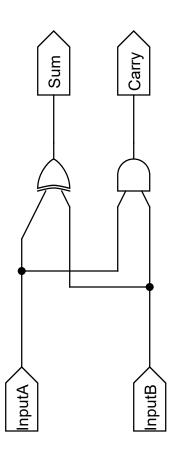
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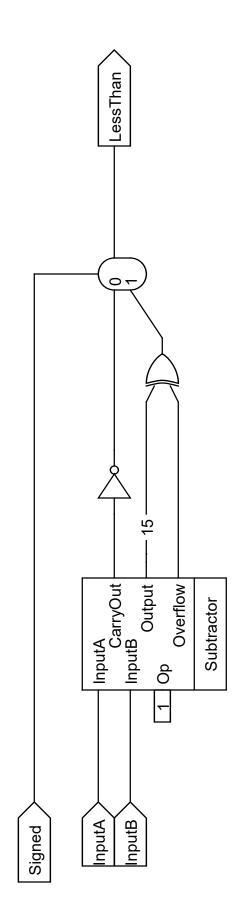


Total # of Gates in Circuit: 173 Name: James Baumhardt & Brendon Werner

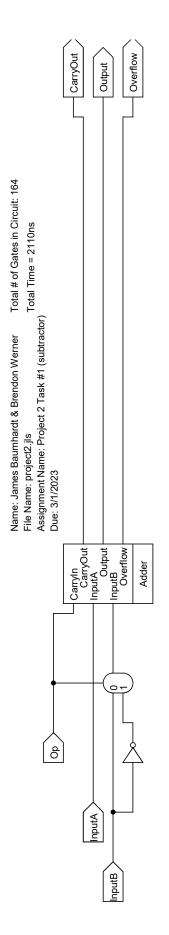
Total Time = 2215ns

File Name: project2_2.jls Assignment Name: Project 2 Task #2 (slt)

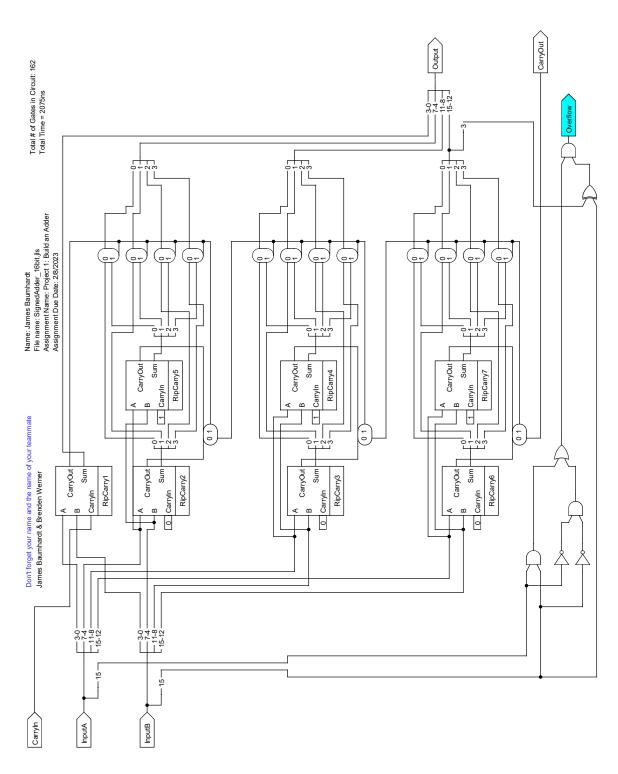
Due: 3/1/2023



Subtractor in Comparator in ALU_16bit_starter



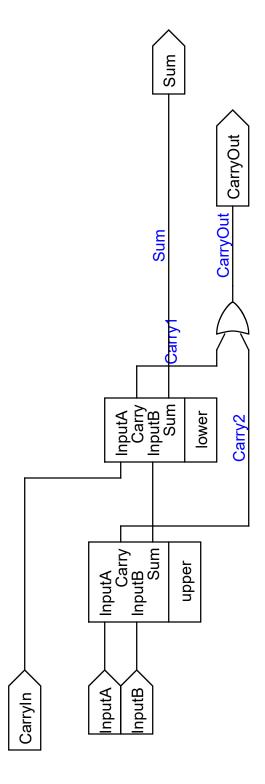
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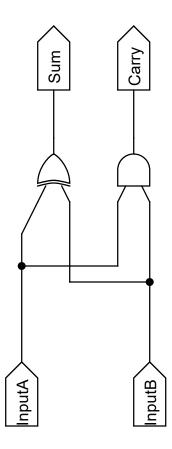
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry2 in Adder in Subtractor in Comparator in ALU_16bit_starter

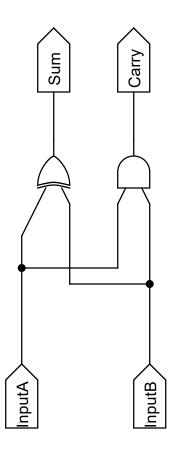
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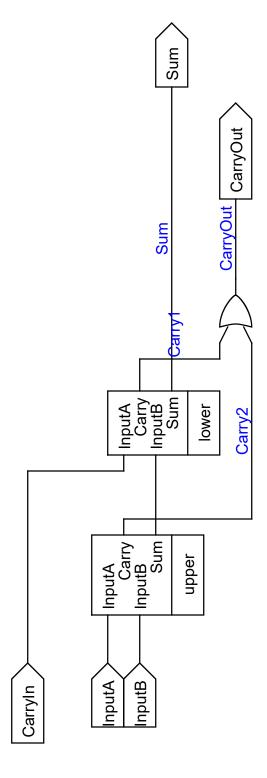
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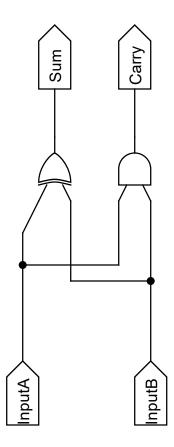
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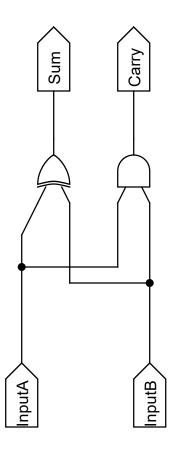
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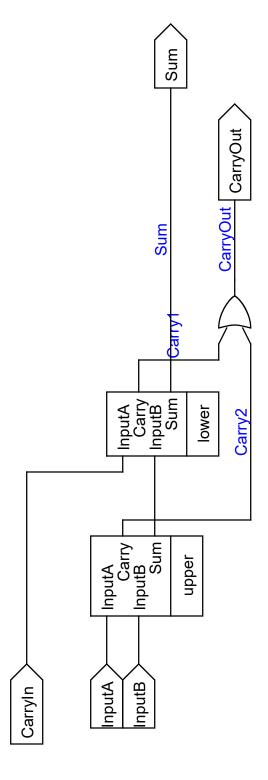
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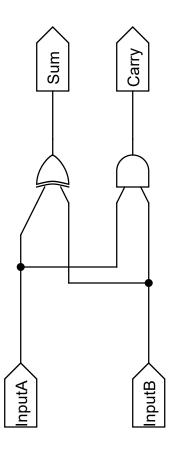
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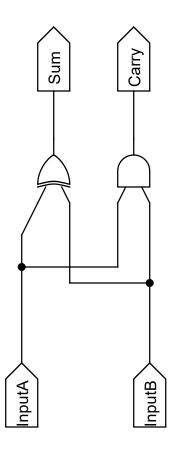
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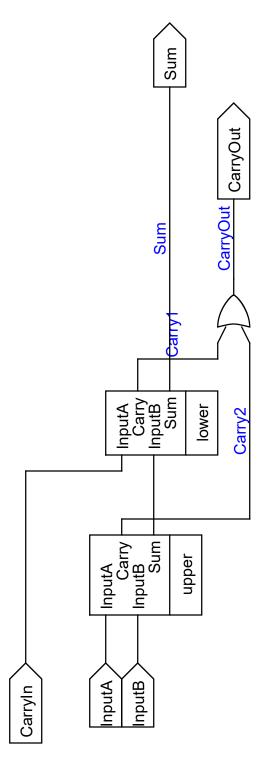
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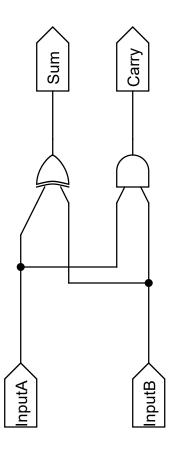
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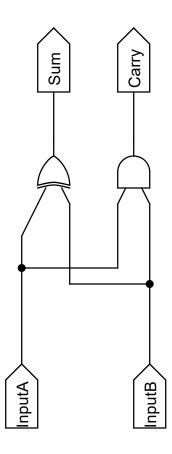
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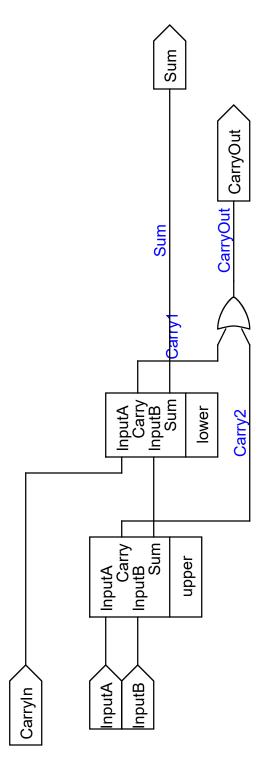
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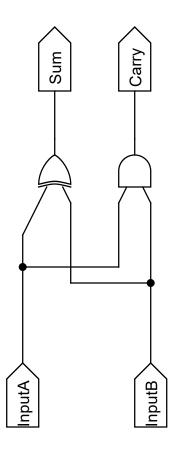
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry3 in Adder in Subtractor in Comparator in ALU_16bit_starter

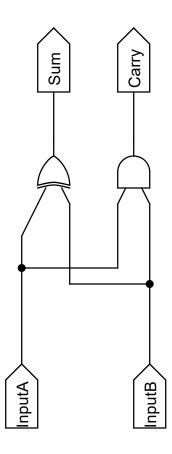
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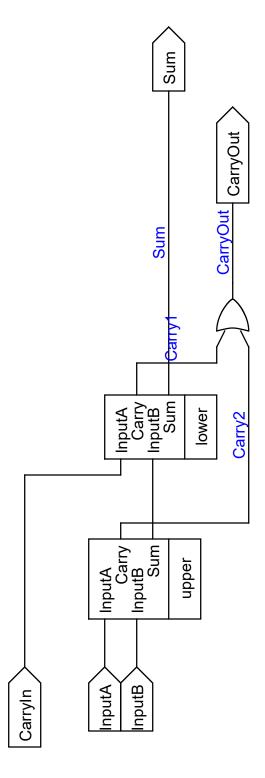
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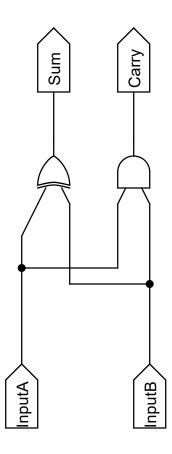
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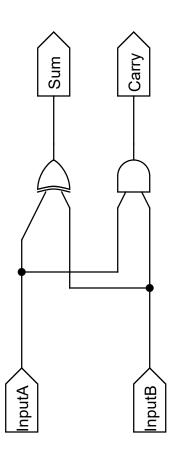
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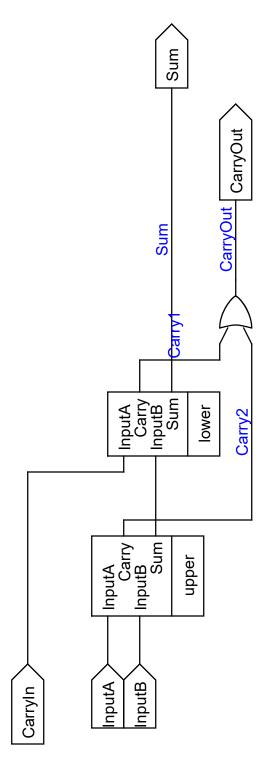
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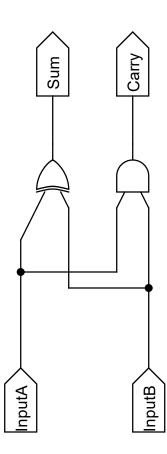
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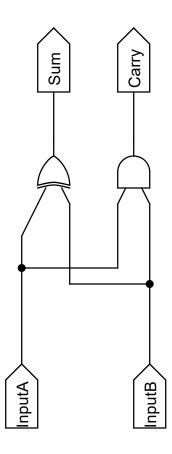
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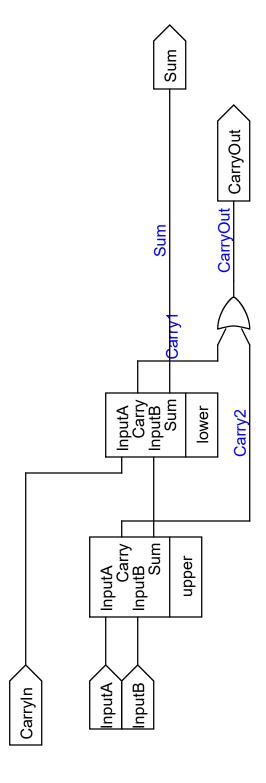
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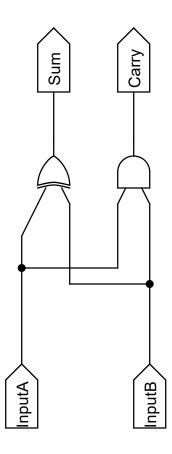
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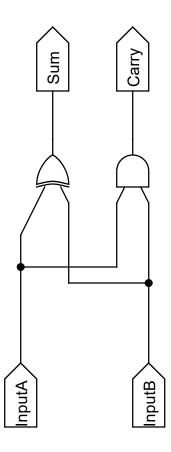
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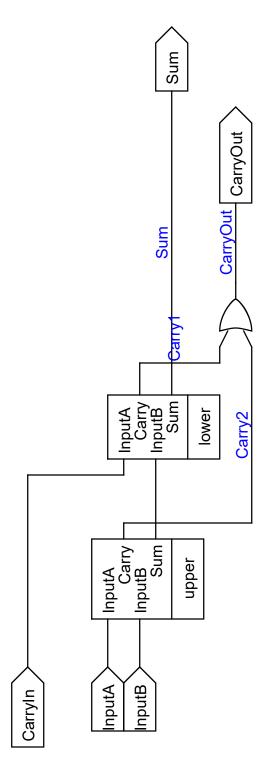
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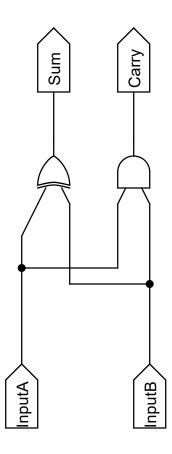
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry7 in Adder in Subtractor in Comparator in ALU_16bit_starter

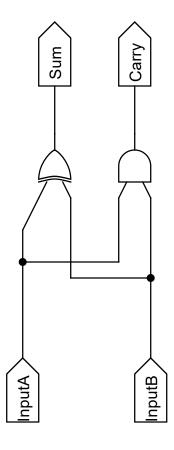
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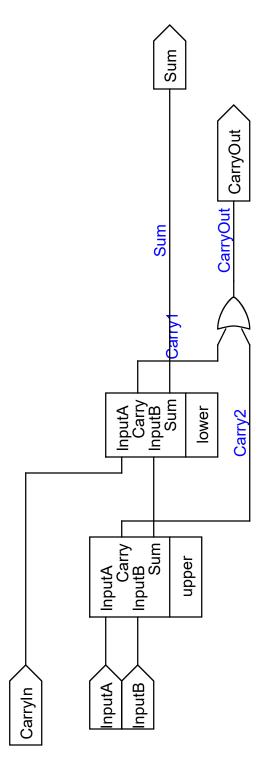
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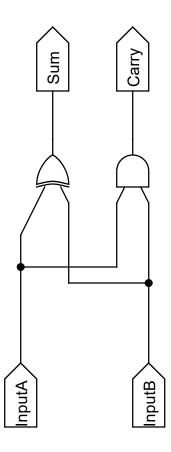
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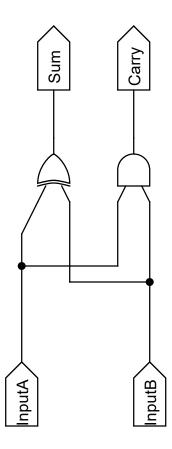
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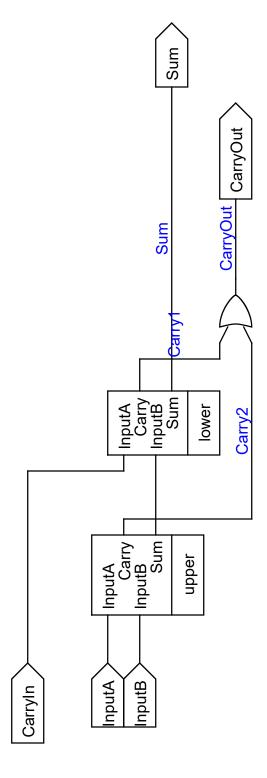
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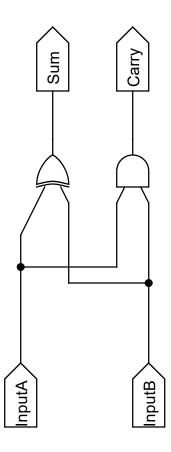
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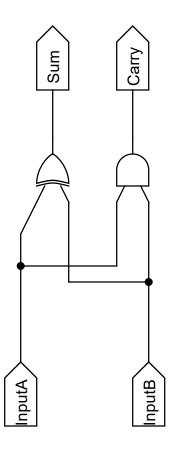
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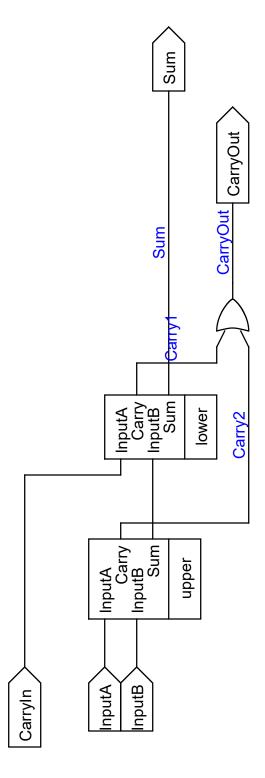
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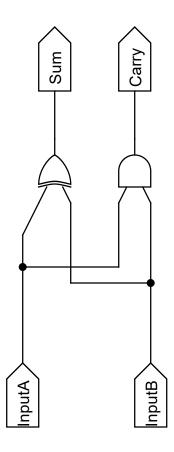
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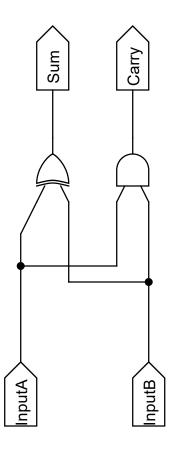
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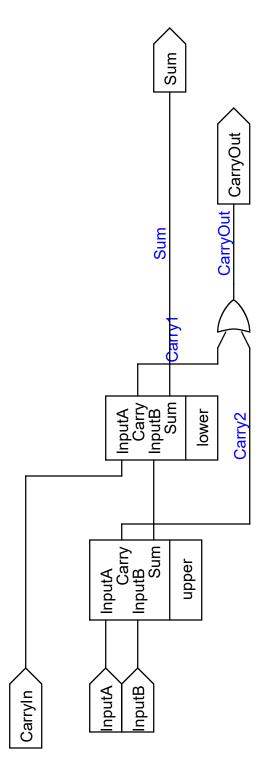
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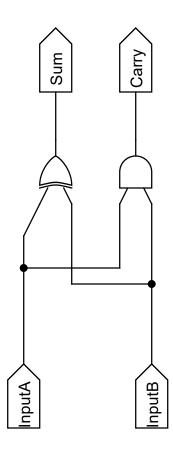
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InputA
InputB Adder_3 Carryln CarryOut InputA InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry5 in Adder in Subtractor in Comparator in ALU_16bit_starter

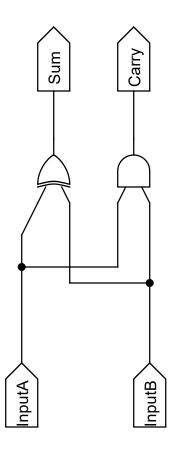
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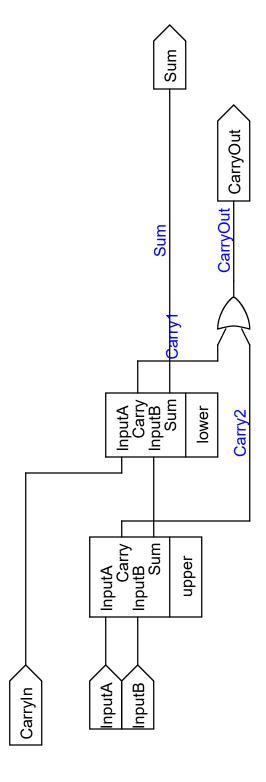
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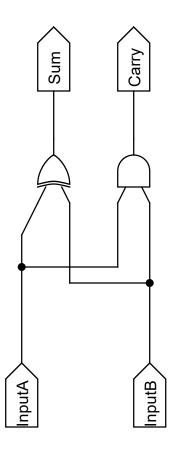
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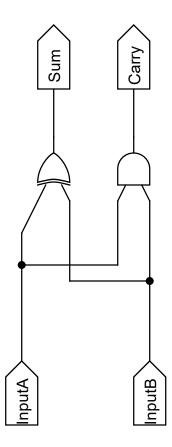
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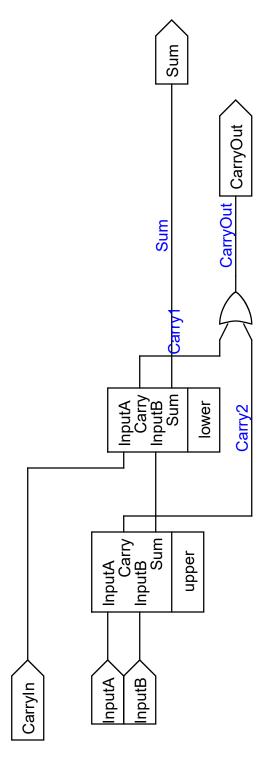
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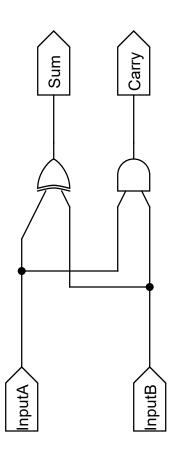
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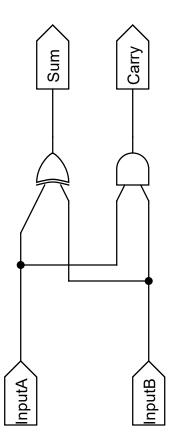
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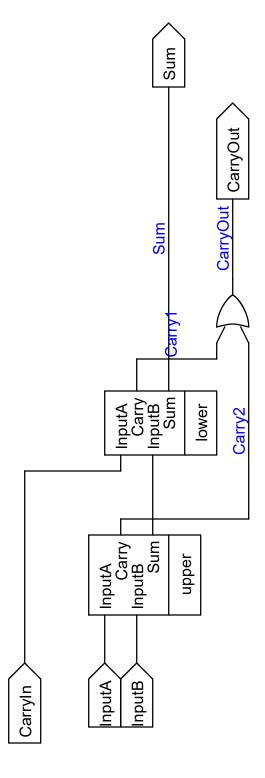
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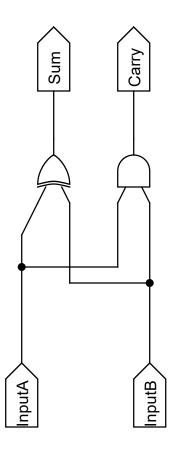
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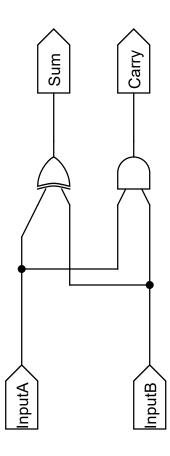
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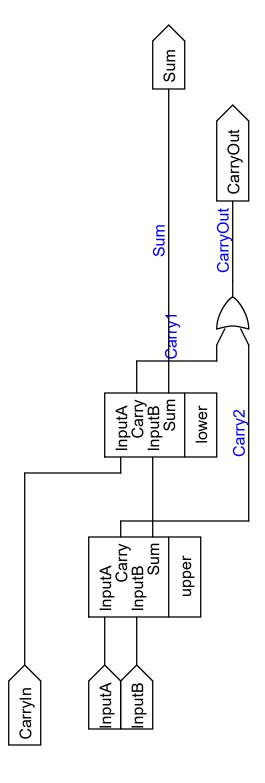
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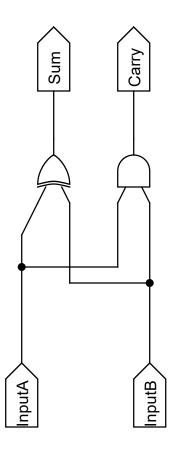
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA Sum InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry6 in Adder in Subtractor in Comparator in ALU_16bit_starter

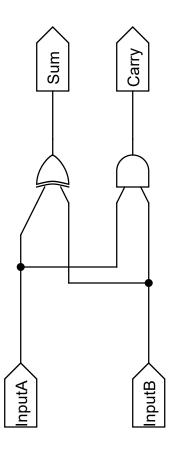
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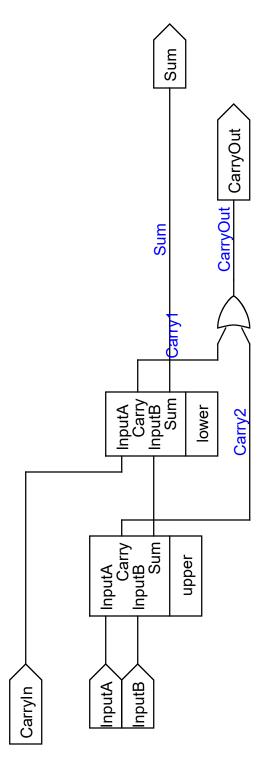
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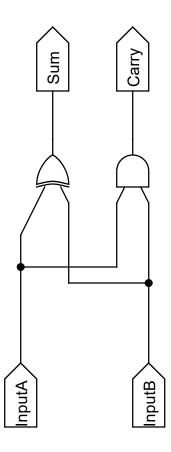
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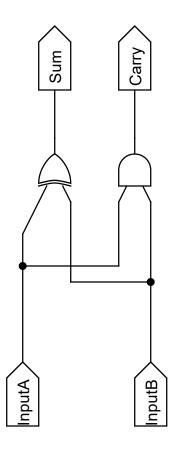
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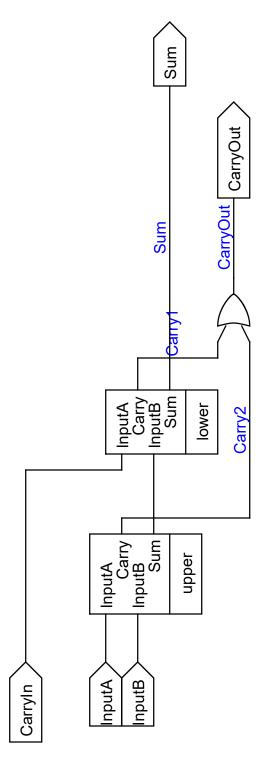
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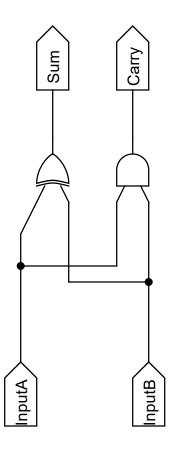
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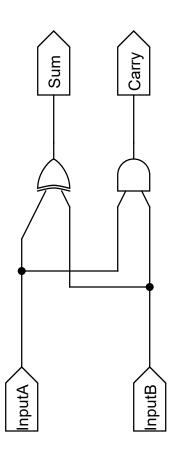
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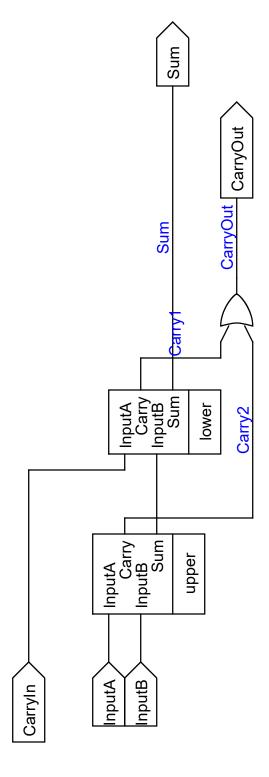
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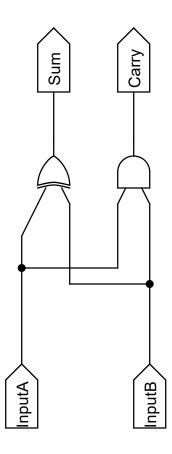
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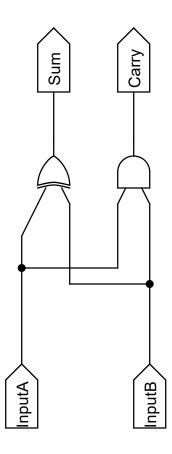
Adder_1 in RipCarry6 in Adder in Subtractor in Comparator in ALU_16bit_starter



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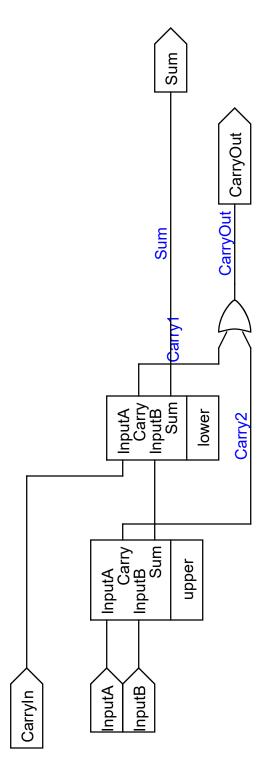
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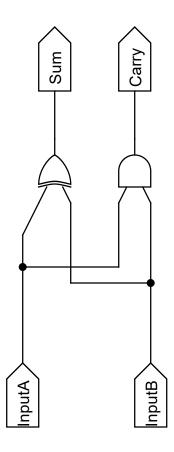
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA Sum InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry1 in Adder in Subtractor in Comparator in ALU_16bit_starter

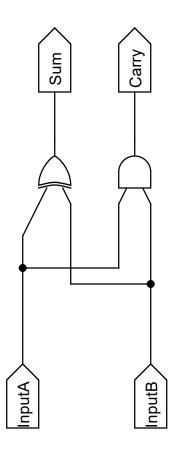
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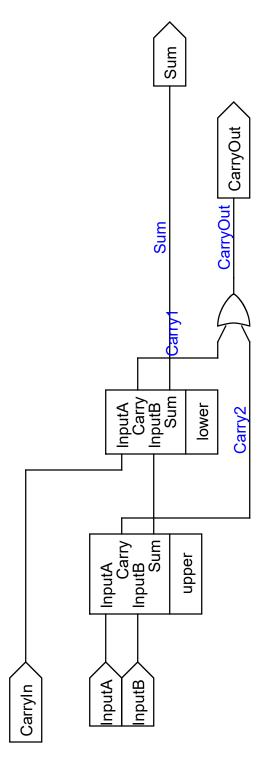
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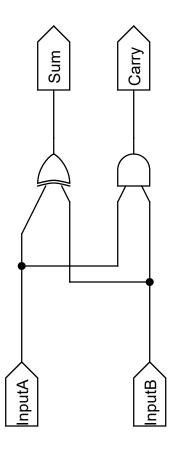
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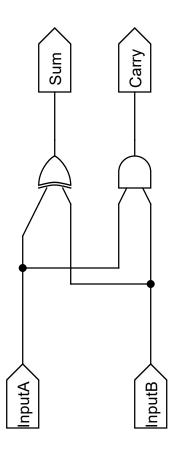
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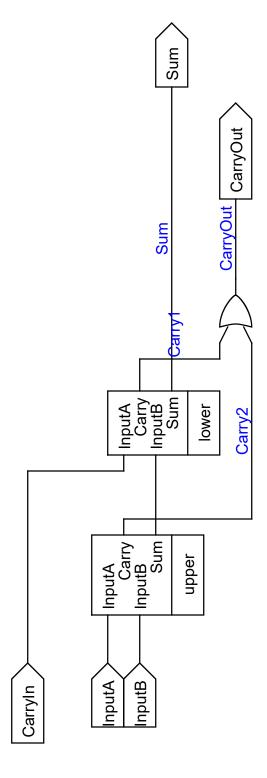
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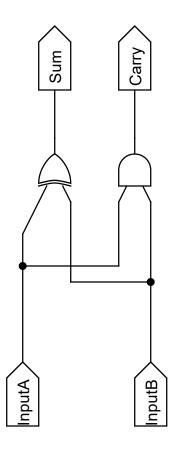
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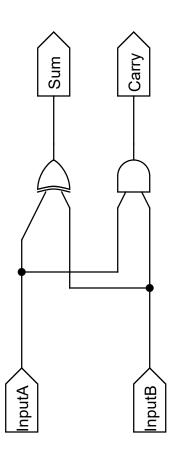
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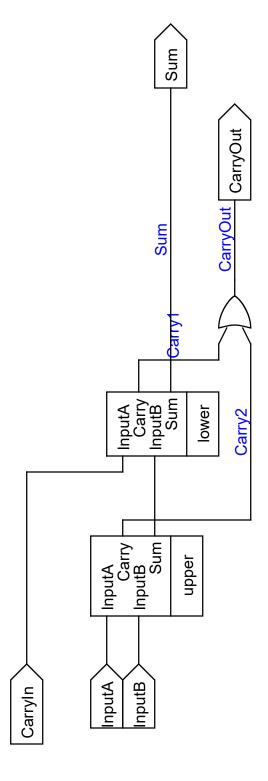
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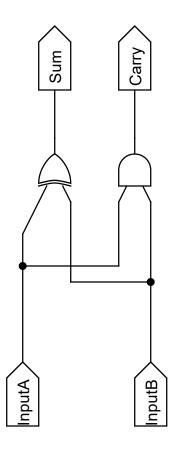
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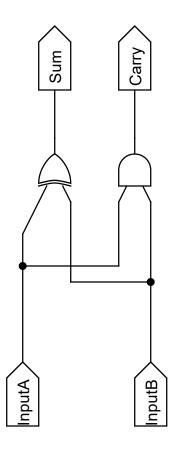
Adder_4 in RipCarry1 in Adder in Subtractor in Comparator in ALU_16bit_starter



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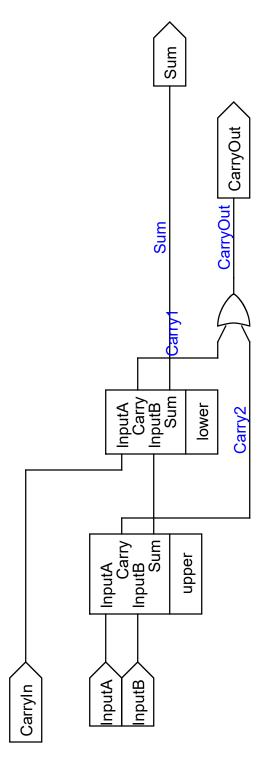
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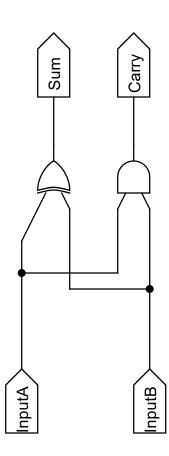
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CarryOut
InputA
InputB Adder_3 Carryln CarryOut InputA Sum InputB Adder_2 Carryln CarryOut – InputA Sum – InputB Adder_1 Carryln

RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter

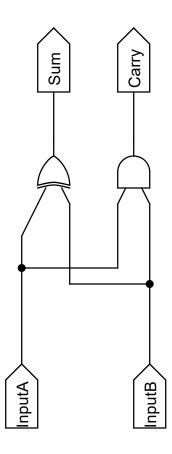
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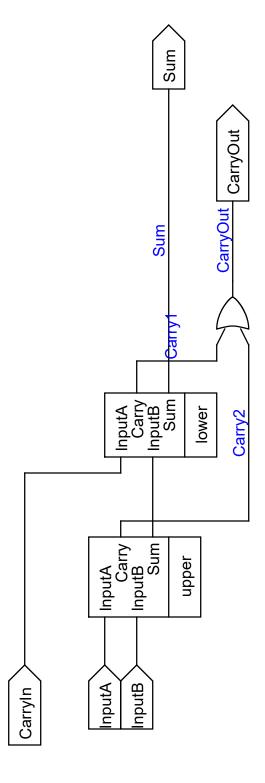
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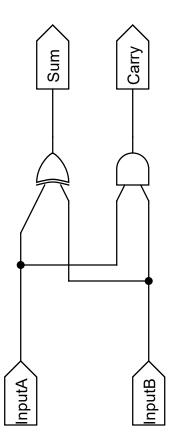
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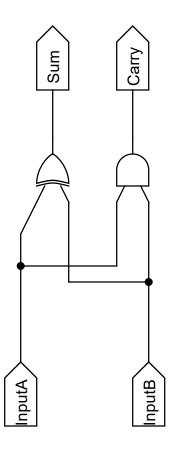
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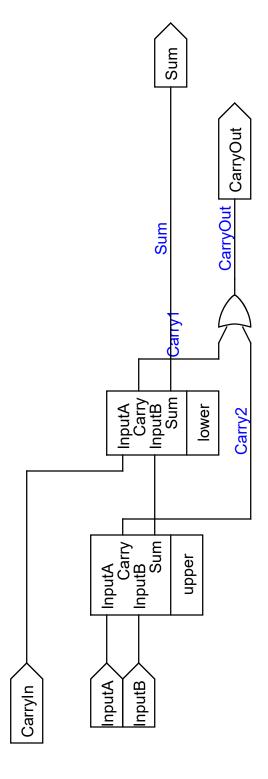
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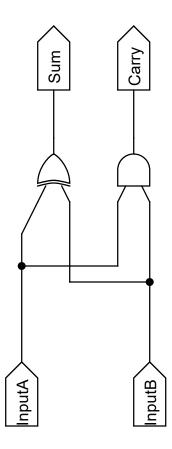
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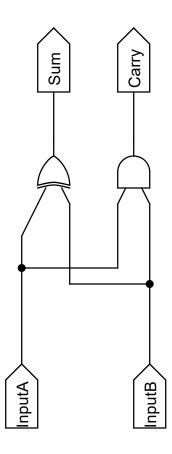
Adder_1 in RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter



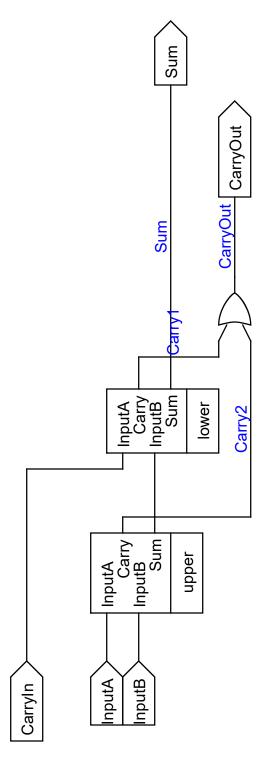
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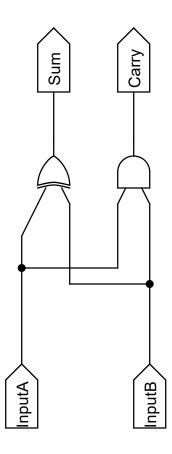
lower in Adder_1 in RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter



Adder_4 in RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter



lower in Adder_4 in RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter



upper in Adder_4 in RipCarry4 in Adder in Subtractor in Comparator in ALU_16bit_starter

