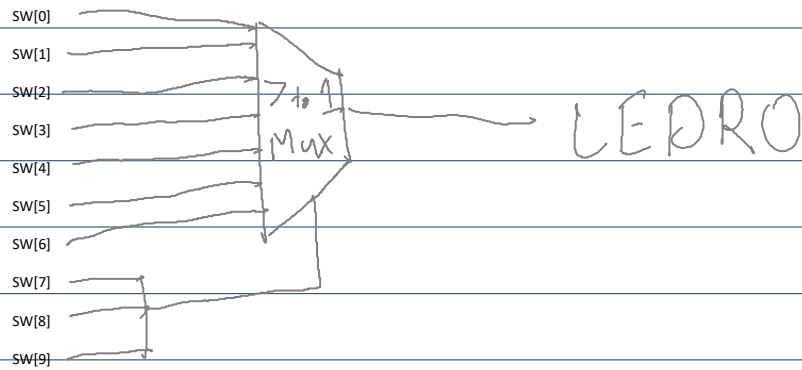


## Part I

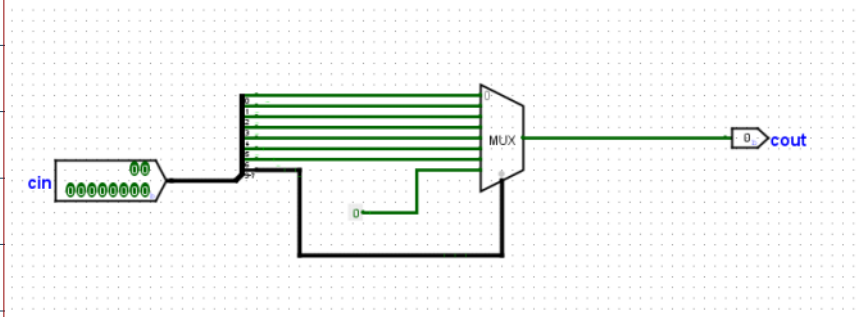
### 1. a) Schematic



### 1. b) Number of bits

10 bits will be required as you need 7 for the selection input and 3 bits to represent which input to choose, this is because 3 is the smallest number of bits that can represent at least 7 distinct integers

### 2. Logisim



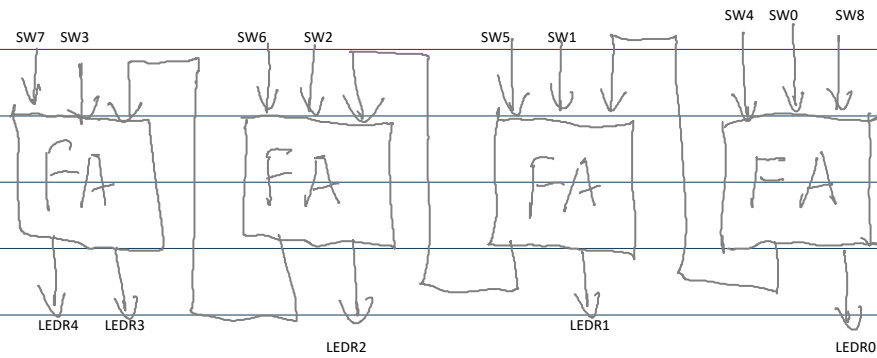
### 3. Tests

Passed: 14 Failed: 0

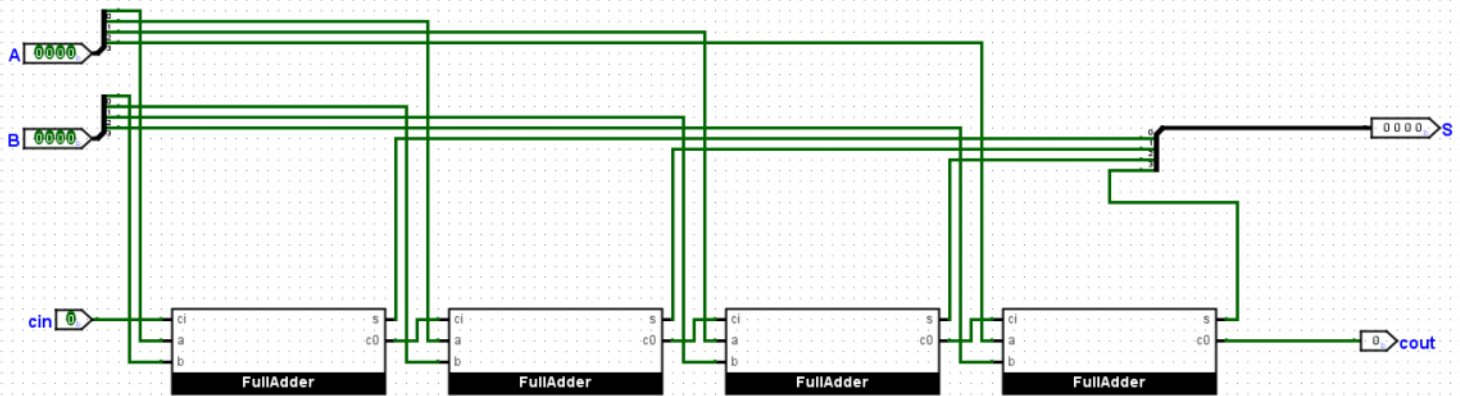
status	cin	cout
pass	00 0000 0001	1
pass	00 0000 0000	0
pass	00 1000 0010	1
pass	00 1000 0000	0
pass	01 0000 0100	1
pass	01 0000 0000	0
pass	01 1000 1000	1
pass	01 1000 0000	0
pass	10 0001 0000	1
pass	10 0000 0000	0
pass	10 1010 0000	1
pass	10 1000 0000	0
pass	11 0100 0000	1
pass	11 0000 0000	0

# Part II

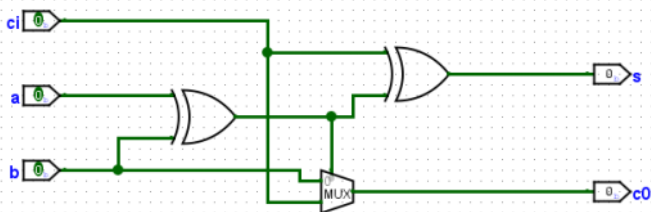
## 1. Schematic



## 2. Logisim



Full adder:



## 3. Tests

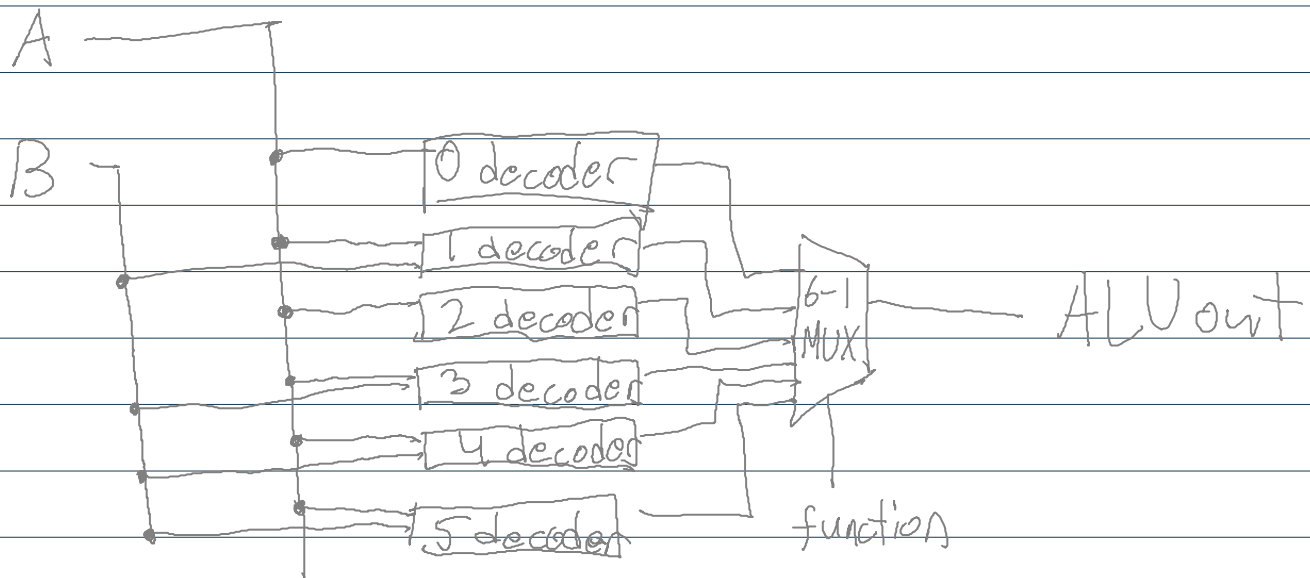
Logisim: Test Vector main of Part2

Passed: 5 Failed: 0

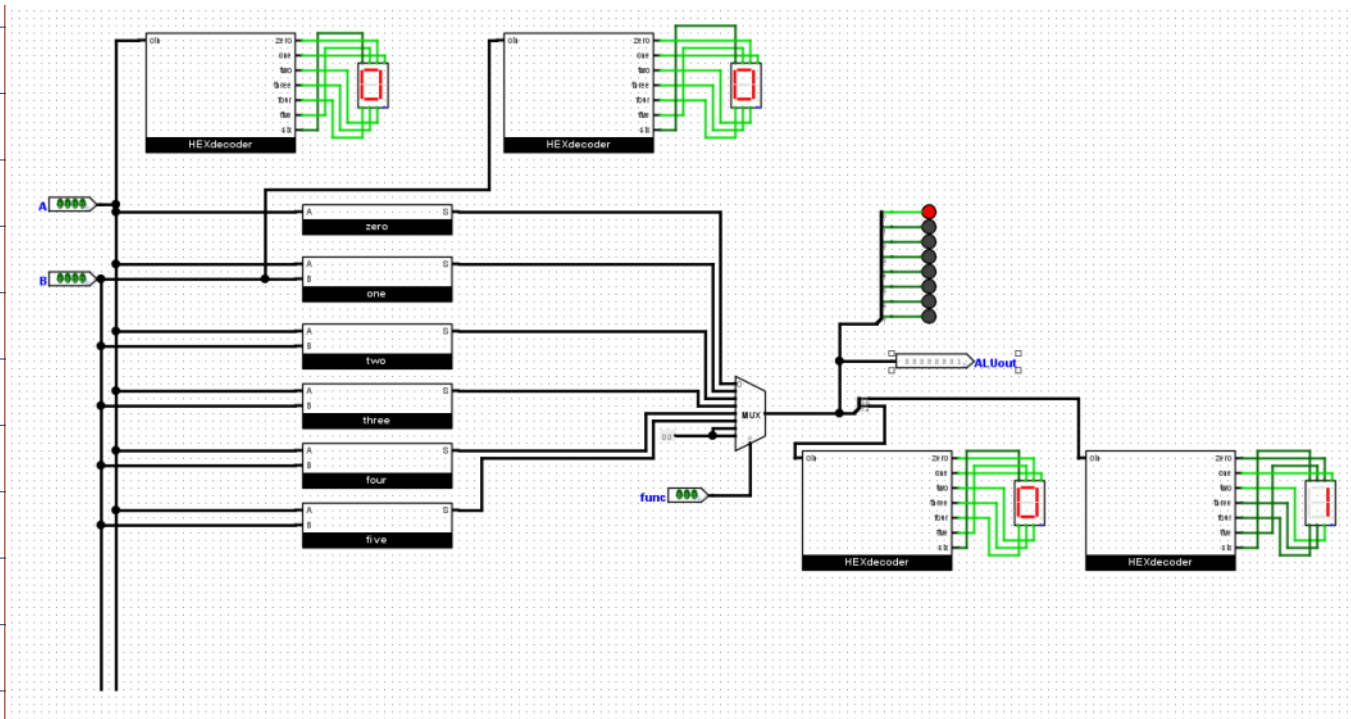
status	cin	A	B	S	cout
pass	0	0000	0000	0000	0
pass	0	1111	0001	0000	1
pass	0	1111	1111	1110	1
pass	1	1111	0000	0000	1
pass	1	0000	0000	0001	0

## Part II

### 1. Schematic



### 2. Logisim



### 3. Tests

Logisim: Test Vector ALU of Part3

Passed: 13 Failed: 0

status	A	B	func	ALUout
pass	0000	0000	000	0000 0001
pass	1111	0101	000	0001 0000
pass	1111	1111	001	0001 1110
pass	0000	0000	001	0000 0000
pass	1111	1111	010	0001 1110
pass	0000	0000	010	0000 0000
pass	1010	1011	011	1011 0001
pass	0000	0000	100	0000 0000
pass	0100	0100	100	0000 0001
pass	0100	0000	100	0000 0001
pass	0000	0100	100	0000 0001
pass	0100	0010	101	0100 0010
pass	0001	1000	101	0001 1000