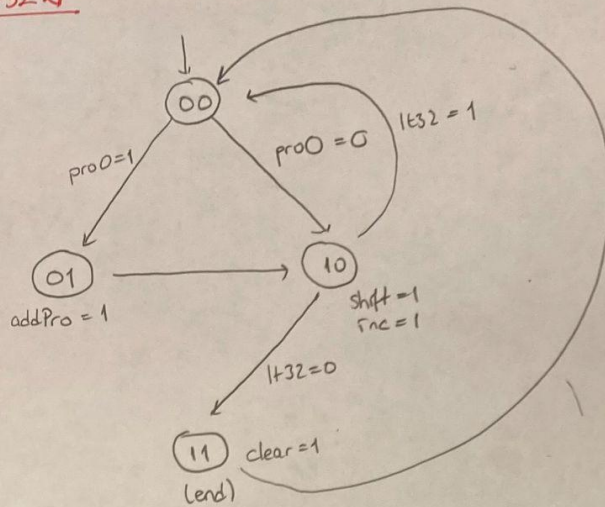


# CSE 331 - Homework 2

## 1. Mult32 ~



| <u>p1</u> | <u>p0</u> | <u>pro0</u> | <u>lt32</u> | <u>n1</u> | <u>n0</u> | <u>addpro</u> | <u>shift</u> | <u>inc</u> | <u>clr</u> |
|-----------|-----------|-------------|-------------|-----------|-----------|---------------|--------------|------------|------------|
| 0         | 0         | 0           | x           | 1         | 0         | 0             | 1            | 1          | 0          |
| 0         | 0         | 1           | x           | 0         | 1         | 1             | 0            | 0          | 0          |
| 0         | 1         | x           | x           | 1         | 0         | 0             | 1            | 1          | 0          |
| 1         | 0         | x           | 0           | 1         | 1         | 0             | 0            | 0          | 1          |
| 1         | 0         | x           | 1           | 0         | 0         | 0             | 0            | 0          | 0          |
| 1         | 1         | x           | x           | 0         | 0         | 0             | 0            | 0          | 0          |

$$n1 = p1'p0'pro0 + p1'p0 + p1p0'tt32'$$

$$n0 = p1'p0'pro0 + p1p0'tt32'$$

$$addpro = p1'p0'pro0$$

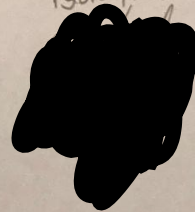
$$shift = p1'p0'pro0 + p1'p0 \quad \left. \vphantom{p1'p0'pro0 + p1'p0} \right\} \text{same}$$

$$inc = p1'p0'pro0 + p1'p0 \quad \left. \vphantom{p1'p0'pro0 + p1'p0} \right\} \text{same}$$

$$clr = p1p0'tt32'$$

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```
# time = 0, a =000000000000000000000000000000000001, b=000000000000000000000000000000000001, carry_in=0, sum=000000000000000000000000000000000010, carry_out=0
# time = 20, a =0000000000000000000000000000000000010, b=0000000000000000000000000000000000010, carry_in=1, sum=00000000000000000000000000000000000101, carry_out=0
# time = 40, a =0000000000000000000000000000000000000, b=000000000000000000000001111111111111111, carry_in=0, sum=000000000000000000000001111111111111111, carry_out=0
# time = 60, a =111111111111111111111111111111111111, b=000000000000000000000000000000000001, carry_in=1, sum=000000000000000000000000000000000001, carry_out=1
```

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```
# time = 0, previous_state = xx, pro0 = x, lt32 = x, next_state = xx, addPro = x, shift_inc = x, clr = x
# time = 5, previous_state = 00, pro0 = x, lt32 = x, next_state = xx, addPro = x, shift_inc = x, clr = 0
# time = 10, previous_state = 00, pro0 = 0, lt32 = 0, next_state = 10, addPro = 0, shift_inc = 1, clr = 0
# time = 15, previous_state = 10, pro0 = 0, lt32 = 0, next_state = 11, addPro = 0, shift_inc = 0, clr = 1
# time = 25, previous_state = 11, pro0 = 0, lt32 = 0, next_state = 00, addPro = 0, shift_inc = 0, clr = 0
# time = 30, previous_state = 11, pro0 = 1, lt32 = 0, next_state = 00, addPro = 0, shift_inc = 0, clr = 0
# time = 35, previous_state = 00, pro0 = 1, lt32 = 0, next_state = 01, addPro = 1, shift_inc = 0, clr = 0
# time = 40, previous_state = 00, pro0 = 1, lt32 = 1, next_state = 01, addPro = 1, shift_inc = 0, clr = 0
# time = 45, previous_state = 01, pro0 = 1, lt32 = 1, next_state = 10, addPro = 0, shift_inc = 1, clr = 0
```

[illegible]



[illegible][illegible]