

計算機システム演習 第6回レポート

17B13541

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1 実行結果

```
MUX(0, 0, 0) => (0)
MUX(0, 0, 1) => (0)
MUX(0, 1, 0) => (0)
MUX(0, 1, 1) => (1)
MUX(1, 0, 0) => (1)
MUX(1, 0, 1) => (0)
MUX(1, 1, 0) => (1)
MUX(1, 1, 1) => (1)
ALU(AND, 0, 0, 0) => (0, 0)
ALU(AND, 0, 0, 1) => (0, 0)
ALU(AND, 0, 1, 0) => (0, 0)
ALU(AND, 0, 1, 1) => (0, 1)
ALU(AND, 1, 0, 0) => (0, 0)
ALU(AND, 1, 0, 1) => (0, 1)
ALU(AND, 1, 1, 0) => (1, 1)
ALU(AND, 1, 1, 1) => (1, 1)
ALU(OR, 0, 0, 0) => (0, 0)
ALU(OR, 0, 0, 1) => (0, 0)
ALU(OR, 0, 1, 0) => (0, 1)
ALU(OR, 0, 1, 1) => (0, 1)
ALU(OR, 1, 0, 0) => (1, 0)
ALU(OR, 1, 0, 1) => (1, 0)
ALU(OR, 1, 1, 0) => (1, 1)
ALU(OR, 1, 1, 1) => (1, 1)
ALU(ADD, 0, 0, 0) => (0, 0)
ALU(ADD, 0, 0, 1) => (0, 0)
ALU(ADD, 0, 1, 0) => (0, 1)
ALU(ADD, 0, 1, 1) => (0, 1)
ALU(ADD, 1, 0, 0) => (1, 0)
ALU(ADD, 1, 0, 1) => (1, 0)
ALU(ADD, 1, 1, 0) => (1, 1)
ALU(ADD, 1, 1, 1) => (1, 1)
```

```

ALU(ADD, 0, 1, 1) => (0, 1)
ALU(ADD, 1, 0, 1) => (0, 1)
ALU(ADD, 1, 1, 1) => (1, 1)
a = 100, b = 200
ALU32(AND, 64, c8, 0) => (40, 0, 0)
ALU32(OR, 64, c8, 0) => (ec, 0, 0)
ALU32(ADD, 64, c8, 0) => (12c, 0, 0)
ALU32(SUB, 64, c8, 0) => (ffffff9c, 0, 0) a != b
ALU32(SLT, 64, c8, 0) => (1, 0, 0)
a = 100, b = 100
ALU32(AND, 64, 64, 0) => (64, 0, 0)
ALU32(OR, 64, 64, 0) => (64, 0, 0)
ALU32(ADD, 64, 64, 0) => (c8, 0, 0)
ALU32(SUB, 64, 64, 0) => (0, 1, 0) a = b
ALU32(SLT, 64, 64, 0) => (0, 1, 0)
OVERFLOW(ADD, 40000000 >=0, 40000000 >=0, 0)
=> (80000000 <0, 0, 1)
OVERFLOW(ADD, 80000001 <0, 80000000 <0, 0)
=> (1 >=0, 0, 1)
OVERFLOW(SUB, 40000000 >=0, 80000000 <0, 0)
=> (c0000000 <0, 0, 1)
OVERFLOW(SUB, 80000000 <0, 40000000 >=0, 0)
=> (40000000 >=0, 0, 1)

```

2 課題2

演算	a	b	overflow を起こした時の 実行結果 s	binvert	a (msb)	b (msb)	s (msb)
a + b	>=0	>=0	<0	0	0	0	1
a + b	<0	<0	>=0	0	1	1	0
a - b	>=0	<0	<0	1	0	1	1
a - b	<0	>=0	>=0	1	1	0	0

積和標準形

$$\overline{\text{binvert}} \cdot \overline{a} \cdot \overline{b} \cdot s + \overline{\text{binvert}} \cdot a \cdot b \cdot \overline{s} + \text{binvert} \cdot \overline{a} \cdot b \cdot s + \text{binvert} \cdot a \cdot \overline{b} \cdot \overline{s}$$

3 感想

前回に比べると理解しやすく、option 課題まで終わらせました。ALU32(SUB)の結果が1ずれていたので間違っている箇所を見つけるために MUX も test しました。