Computer architecture lab 2

* Op 0

Unsigned add

|  |  |  |
| --- | --- | --- |
|  | Correct | Error |
| Operand1 | 00000005 | FFFFFFFF |
| Operand2 | 00000006 | 0000001 |
| Operation | 0 | 0 |
| signed | 0 | 0 |
| error | 0 | overflow |

Signed add

|  |  |  |  |
| --- | --- | --- | --- |
|  | Correct | Error | Error |
| Operand1 | FFFFFFF6 | 8000000 | 7FFFFFFF |
| Operand2 | FFFFFFF3 | 8000001 | 00000001 |
| Operation | 0 | 0 | 0 |
| signed | 1 | 1 | 1 |
| error | 0 | underflow | overflow |

* Op 1

Unsigned subtract

|  |  |  |
| --- | --- | --- |
|  | Correct | Error |
| Operand1 | AAAAAAAA | 00000001 |
| Operand2 | 11111111 | 0000000A |
| Operation | 1 | 1 |
| signed | 0 | 0 |
| error | 0 | underflow |

Signed subtract

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Correct | Correct | Error | Error |
| Operand1 | 0AAAAAAA | FFFFFFF6 | 7FFFFFFF | 80000000 |
| Operand2 | 09999999 | FFFFFFFB | 80000000 | 7FFFFFFFF |
| Operation | 1 | 1 | 1 | 1 |
| signed | 1 | 1 | 1 | 1 |
| error | 0 | 0 | overflow | underflow |

* Op 2

Bitwise AND

|  |  |  |
| --- | --- | --- |
|  | Correct | Correct |
| Operand1 | 99999999 | EEEEEEEE |
| Operand2 | 55555555 | 11111111 |
| Operation | 2 | 2 |
| signed | 0 | 0 |
| result | 11111111 | 0000000 |

9 and 5 = 1001 and 0101 = 0001 = 1

E and 1 = 1110 and 0001 = 0000 = 0

op

* Op 3

OR

|  |  |  |
| --- | --- | --- |
|  | Correct | Error |
| Operand1 | 99999999 | EEEEEEEE |
| Operand2 | 55555555 | 11111111 |
| Operation | 3 | 3 |
| signed | 0 | 0 |
| result | DDDDDDDD | FFFFFFFF |

9 or 5 = 1001 or 0101 = 1101 = D

E or 1 = 1110 or 0001 = 1111 = F

* Op b

Set less than

|  |  |  |
| --- | --- | --- |
|  | False | True |
| Operand1 | FFFFFFFF | 33333333 |
| Operand2 | 22222222 | AAAAAAAA |
| Operation | b | b |
| signed | 0 | 0 |
| result | 00000000 | 00000001 |

* Op e

Unsigned multiplication

|  |  |  |
| --- | --- | --- |
|  | Correct | Error |
| Operand1 | 00000003 | FFFFFFFF |
| Operand2 | 00000005 | 00000002 |
| Operation | e | e |
| signed | 0 | 0 |
| result | 0000000F |  |
| error | 0 | 1 |

Signed multiplication

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Correct | Correct | Error | Error |
| Operand1 | FFFFFFFD = -3 | FFFFFFFD | 80000000 | 7FFFFFFF |
| Operand2 | FFFFFFFB = -5 | 00000005 | 00000002 | 00000002 |
| Operation | e | e | e | e |
| signed | 1 | 1 | 1 | 1 |
| result | 0000000F | 0000000F |  |  |
| error | 0 | 0 | 1 | 1 |