**In1** = **5** = **00000000\_00000000\_00000000\_00000101**

**In2** = **-3**= (~00000000\_00000000\_00000000\_00000011) +1 = =11111111\_11111111\_11111111\_11111100 +1 =

=**11111111\_11111111\_11111111\_11111101**

**Imm**= **-12** =(~ 00000000\_00001100)+1=

=11111111\_11110011 +1 =

=**11111111\_11110100**

**ImmExt**(ALUop=ADDI)= **11111111\_11111111\_11111111\_11110100**

=

=

**ImmExt**(ALUop=ORI) = **00000000\_00000000\_11111111\_11110100**

=

=

**Sh**= **2**

***ADD: in1+in2***

5+(-3)=

00000000\_00000000\_00000000\_00000101

+

11111111\_11111111\_11111111\_11111101

=

**00000000\_00000000\_00000000\_00000010** =

***SUB: in1-in2***

5-(-3)= 5+3=

00000000\_00000000\_00000000\_00000101

+

00000000\_00000000\_00000000\_00000011

=

**00000000\_00000000\_00000000\_00001000** =

***ADDI: in1+ImmExt***

5+(-12)=

00000000\_00000000\_00000000\_00000101

+

11111111\_11111111\_11111111\_11110100

=

**11111111\_11111111\_11111111\_11111001**

=

=

***OR: in1|in2***

5|(-3)=

00000000\_00000000\_00000000\_00000101

OR

11111111\_11111111\_11111111\_11111101

=

**11111111\_11111111\_11111111\_11111101**

=

=

***ORI: in1|ImmExt***

5|65524=

00000000\_00000000\_00000000\_00000101

OR

00000000\_00000000\_11111111\_11110100

=

**00000000\_00000000\_11111111\_11110101**

=

=

***SLL: in2<<sh***

-3<<2=

11111111\_11111111\_11111111\_11111101 << 2

=

**11**111111\_11111111\_11111111\_11111101**00**

=

**11111111\_11111111\_11111111\_11110100**

=

=

***SRL: in2>>sh***

-3>>2=

11111111\_11111111\_11111111\_11111101 >> 2

=

**00**11111111\_11111111\_11111111\_111111**01**

=

**00111111\_11111111\_11111111\_11111111**

=

=

***SRA: in2>>>sh***

-3>>>2=

11111111\_11111111\_11111111\_11111101 >>> 2

=

**11**11111111\_11111111\_11111111\_111111**01**

=

**11111111\_11111111\_11111111\_11111111**

=

=