Assignment #3

a.

```
            addi $s0, $zero, 77
            addi $s1, $zero, 31234
            lw $t0, 12($s1)
    domore: addi $t0, $t0, 100
            sw $t0, 8($s1)
            addi $s0, $s0, 1
            slti $t7, $s0, 150
            addi $s1, $s1, 1
            bne $t7, $zero, domore
            sub $s0, $s0, 100
```

addi $s0, $zero, 77

I format, Opcode : 8, rt : $s0 :16, rs : $zero : 0, immediate : 77 : 00 4D

=> 8 0 16 4D => | 00|000 00000|000 0 000000 000 0|00|1|0|1 |

hex D D Hex   0 X 2   0   1   0   0   0   4   D

addi $s1, $zero, 31234

I format, Opcode : 8, rt : $s1 :17, rs : $zero : 0, immediate : 31234 : 7A02

=> 8 0 16 4D => | 00|000 00000|000 1 | 0|1111 0|0000 000 0|0 |

hex D D Hex   0 X 2   0   1   1   7   A   0   2

lw $t0, 12($s1)

I format, Opcode : 23, rt : $t0 : 8, rs : $s1 : 17, immediate : 12 : 000C

=> 23 17 8 C => | 1000 11 | 0001 0|000 0000 0000 0000 1100 |

hex D D Hex   0 X 8   E   2   8   0   0   0   C

domore: addi $t0, $t0, 100

I format, Opcode : 8, rt : $t0 : 8, rs : $t0 : 8, immediate : 100 : 00 64

=> 8 8 8 64 => | 00|000 0|000 0|000 0000 0000 0|110 0|00 |

hex D D Hex   0 X 2   1   0   8   0   0   6   4

`sw $t0, 8($s1)`

I format, Opcode: 2b, rt: $t0: 8, rs: $s1: 17, immediate: 8 : 0008

=> 2b 17 8 8   => | 10/0/11 | 1000/ | 0/000 | 0000 0000 0000 1000 |
   hex ⓘ ⓘ Hex   0x A   E   2   8   0   0   0   8

`addi $s0, $s0, 1`

I format, Opcode: 8, rt: $s0 :16, rs: $s0 : 16, immediate : 1 : 0001

=>   8 16 16 1 => | 00/000 | 10000 | 000 0 | 0000000 0000 0000 0001 |
    hex ⓘ ⓘ Hex   0x 2   2   1   0   0   0   0   1

`slti $t7, $s0, 150`

I format, Opcode: A, rt: $t7: 15, rs: $s0 : 16, immediate : 150 : 0096

=>   A 16 15 96 => | 00/010 | 10000 | 01111 | 000000 00/001 0110 |
    hex ⓘ ⓘ Hex   0x 2   A   0   F   0   0   9   6

`addi $s1, $s1, 1`

I format, Opcode: 8, rt: $s1 :17, rs: $s1 : 17, immediate : 1 : 0001

=>   8 17 17 1 => | 00/000 | 10001 | 000 1 | 000000 0000 0000 0001 |
    hex ⓘ ⓘ Hex   0x 2   2   3   1   0   0   0   1

`bne $t7, $zero, domore`   (from next counter go up 6)

I format, Opcode: 5, rt: $zero: 0, rs: $t7: 15, immediate : -6: FFFA

=>   5 15 0 -6 => | 000101 | 01111 | 00000 | 11111 1111 1111 1010 |
    hex ⓘ ⓘ Hex   0x 1   5   E   0   F   F   F   A

`sub $s0, $s0, 100`

R format. but the immediate value should be stored to a register first.

=> addi $1, $0, 100

I format, Opcode: 8, rt: $s0 : 1, rs: $zero: 0, immediate : 100 = 0064

=>   8 0 1 64 =) | 00|000 00000 0000|1 | 0000 000000110 0 0/100 |
          ___
         hex I) I) Hex   0x 2 0 0 1 0 0 6 4

=) sub $s0, $s0, $1

R format, Opcode: 0, rd: $s0: 16, rs: $s0: 16, rt: $1 : 1, shamt: 0, funct: 22

=> 0 16 1 16 0 22 =) | 000000 |10000 00001|10000 00000|10010 |
                         0x 0 2 0 1 8 0 2 2

b.

| 0x20117a02 |
| 0x8e28000c |
| 0x21180064 |
| 0xae8f0008 |
| 0x22100003 |
| 0x2a0f0042 |

0x20117a02

00|00000 0000|000 10|11 10|0 0000 00|0.
                              rs   rt   immidiate
Opcode : 8 : addi , I format. | 00|000 00000 |0001| 01110100000000|0 |
                                  8   0   17   31234
                                 ___
                                 Hex $zero $s1

addi $s1, $zero 31234

A N B 11 C 12.

0x8e28000c

100011|1000|0|000 0000 0000 0000|100

Opcode: 23 : lw, I format.

	rs	rt	immidiate
100011	10001	0/000	0000 0000 0000 1100
23	17	8	12
Hex	$s1	$t0	

lw $t0, 12($s1)

0x21180064

00/000 0/000 | 1000 0000 0000 0|100|00

Opcode: 8 : addi, I format,

	rs	rt	immidiate
00/000	0/000	1|1000	0000 0000 0|100|00
8	8	24	100
Hex	$t0	$t8	

addi $t8, $t0, 100

0xae8f0008

10/0 11 | 10/00 01111 0000 0000 0000 | 000

Opcode: 2B : SW, I format

	rs	rt	immidiate
10/0 11	10/00	01111	0000 0000 0000	000
2A	20	15	8
Hex	$s4	$t7	

SW $t7, 8($s4)

0x22100003

00/000 |0000 |0000 0000000000000011

	rs	rt	immidiate
00/000	|0000	|0000	0000000000000011
8	16	16	3
Hex	$s0	$s0	

Opcode : 8 : addi, I format

addi $s0, $s0, 3

0x2a0f0042

00/0/0 |0000 01111 000000000 |0000/0

	rs	rt	immidiate
00/0/0	|0000	01111	000000000 |0000/0
A	16	15	66
Hex	$s0	$t7	

Opcode : A : slti, I format

slti $t7, $s0, 66