**Bonus Question (Output)**

Given register values :-

$s0 = 0x8000

$s1 = 0x1

*Line 1:* **sll $t0, $s1, 2**

After this register **$t0** will have **0x4** (4 in decimal)

*Line 2:* **add, $t0, $t0, $s0**

After this instruction register **$t0** will have **0x8004** (0x8000 which is in $s0 will be added to the contents of $t0 and stored back in $t0)

*Line 3*: **lh $t1, 1($t0)**

MIPS instruction **lh** load half-word from the given memory location to the target register. Out memory address is 0x8004 which is contained in $t0. Now 1($t0) is one word away from the location pointed by $t0.

So, half word (2 bytes) of the value contained in 0x8008 (0x8004 plus 4 byes) will be loaded to $t1. Data at location 0x8008 is 0xF012AB56. Now **$t1** will have **0xAB56**

*Line 4:* **slti $t2, $t1, 0**

Set on less than the immediate value. So, here value of **$t1** is checked with 0 to find if it is positive or not. It is positive there for **$t2** will be **1**

*Line 5:* **bne $t2, $0, line9**

It compares if **$t2** is 0 or not, since it is not, then it moves to ***line number 9***

*Line 6:* **beq $t1, $0, line10**

Id the value of $t1 is 0 then it moves to line number 10

*Line 7:* **addi $t1, $t1, -1**

Adding value of $t1 with -1 that is decrementing the value of $t1. Since it has 0xAB56, not it will be decremented to 1

*Line 8:* **j line10**

Once it reached this line then it jumps to line 10 bypassing line9

*Line 9:* **addi $t1, $t1, 1**

Increments content of register $t1

*Line 10:* **sb $t1, 2($t0)**

Stores the one byte at location number 0x8010