LAST NAME: FIRST NAME: RECITATION: A1: Th 4-4.50pm☐
PERSON # : A2: Wed 1-1.50pm☐
CSE341 – COMPUTER ORGANIZATION – SPRING 2018 A4: Th 3-3.50pm☐
A5: Wed 8-8.50am☐

HOMEWORK 4 and 5 – DUE 03/05/2018 10:00am

Show detailed steps for solutions for each problem. (Counts as two homework) 100 pts
(Required problems: 1, 2, 4a, 5, 7, 8 only; Needd not turn in the rest (3, 4b, 6), which are practice problems)

1. Consider the following code:

```
lbu $t0, 0($t1)
sw $t0, 0($t2)
```

Assume that the register $t1 contains the address 0x1000 0A00 and the register $t2 contains the address 0x1000 0A10. Note the MIPS architecture utilizes big-endian addressing. Assume that the data (in hexadecimal) at address 0x1000 0A00 is: 0x22331144. What value is stored at the address pointed to by register $t2?

2. What decimal number does the bit pattern 0×0C000100 represent if it is a floating point number? Use the IEEE 754 standard.

Late submissions will not be accepted. Solutions will be discussed in class on March 5th.

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3. What decimal number does the bit pattern 0×0C000009 represent if it is a two's complement integer (optional)

4.

a. Write down the binary representation of the decimal number 68.25 assuming the IEEE 754 single precision format.
b. Write down the binary representation of the decimal number 63.55 assuming the IEEE 754 double precision format. (b part is optional)

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5. Multiply the two following IEEE floating point numbers: 0x 41500000 and 0x40300000. Express your result as a 32 bit hexadecimal number. Convert it to human-readable decimal format.

6. Represent 639.6875 as a single precision floating point number. (Optional)

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7. Consider two registers $s0 and $s1 holding the values 0x00000002 and 0x80000003. Multiplication of two 32 bit values result in a 64-bit product.
    a. Write a MIPS code using 'mult' to multiply the above given values and to hold the upper 32 bits of the product in $s2 and the lower 32 bits of the product in $s3.
    b. Write a MIPS code using 'multu' to multiply the above given values and to hold the upper 32 bits of the product in $a0 and the lower 32 bits of the product in $a1.
    c. Write a MIPS code using shift instructions to multiply the contents of $s2 with 4, storing the result in $v0 and divide the contents of $s3 with 2 and store the results in $v1.

    Write down the contents of registers $s2, $s3, $a0, $a1, $v0 and $v1.

8. Consider two registers $s0 and $s1 holding the values 0x0000004E and 0x00000015.

    Write a MIPS code to divide the value in $s0 by the value in $s1. Store the quotient in $s2 and the remainder in $s3.

    Write the contents of the registers $s2 and $s3.

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