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CPSC 440 ASSIGNMENT NUMBER 1

440 HW

Problem 2.1

Solution:

Let us assume that ~~variables~~ the following variables are mapped to their respective registers.

f = $s0
g = $s1
h = $s2
i = $s3

$$f = g + (h - 5)i$$

~~add to, g~~

```
Add   to, g     # temp variable to
Add   t1,
lw    $t2, 4($s1)   # puts g into a register 4 places away from s1
lw    $t3, 8($s1)   # loads h into 8 places from s1
addi  $t3, $t3, -5  # performs h = h-5 in t3
add   $t1, $t2, $t3 # performs f = g+(h-5)
sw    $t1, 0($s1)   # stores results.
```

2.2) Solution

C statement for

add f, g, h
add f, i, f

Answer)

add fgh implies f = g + h

add f, i, f implies f = i + f

But we know f = g + h

So final statement would be:

f = i + g + h;

2.7 0xabcdef12

Ans) MIPS is big-endian [MSB in the h value has the lowest byte in memory]

0xab #comes first in memory
0xcd # is next and so on.
0xef
0x12

For Little Endian the LSB in the h value ~~has the~~ is stored first. [opposite of ab]
So the seqwence is

0x12
0xef
0xcd
0xab

2.8 $0x abcdef12$ into decimal

Ans)

Hex	Value	Powers	Value * Powers
2	2	16^0	$2 \times 16^0 = 2$
1	1	16^1	$1 \times 16^1 = 16$
f	15	16^2	$15 \times 16^2 = 3840$
e	14	16^3	$14 \times 16^3 = 57,344$
d	13	16^4	$13 \times 16^4 = 851,968$
c	12	16^5	$12 \times 16^5 = 12582912$
b	11	16^6	$11 \times 16^6 = 184549,376$
a	10	16^7	10×16^7 268,435,4560

Σ sum

$0xabcdef12 =$ 288,240,018

2.9)

f	$s0
g, h	$s1
i	$s3
j	$s4

B[8] = A[i] + A[j];

Solution:

```
sll   $t0, $s3, 2     # $t0 = 4 * i
sll   $t1, $4, 2      # t1 = 4 * j
add   $t0, $t0, $s6   # address of A[i]
add   $t1, $t1, $s6   # address of A[j]
lw    $t0, 0($t0)     # t0 = A[i]
lw    $t1, 0($t1)     # t1 = A[j]
                      # we assigned & loaded.
add   $t0, $t1, $t0   # t0 = A[i] + A[j]
addi  $t1, $s7, 32    # address of B[8]
                      # 8 x 4 = 32
sw    $t0, 0($t1)     # B[8] = A[i] + A[j]
```