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CPSC 300

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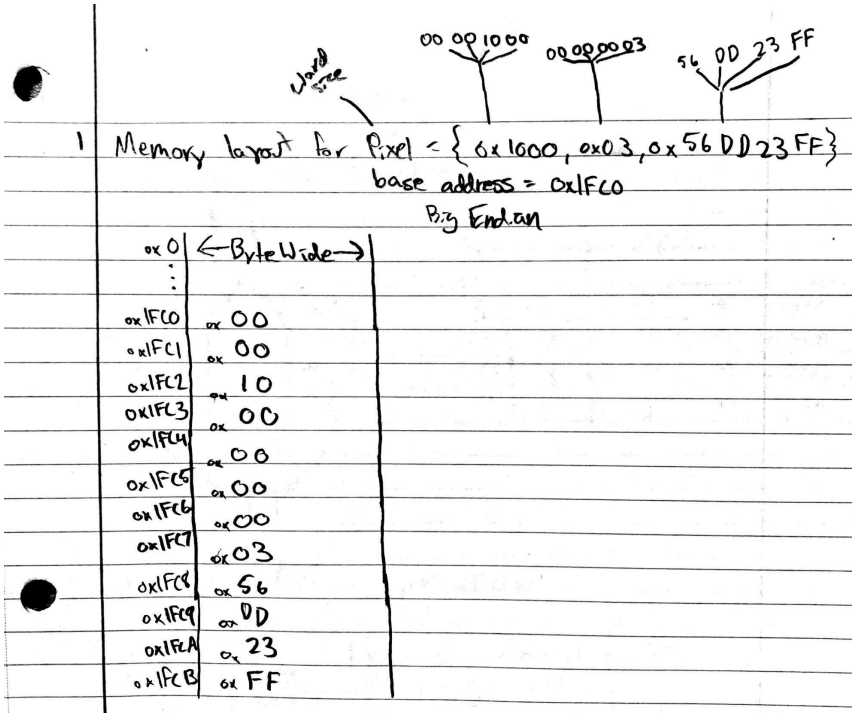
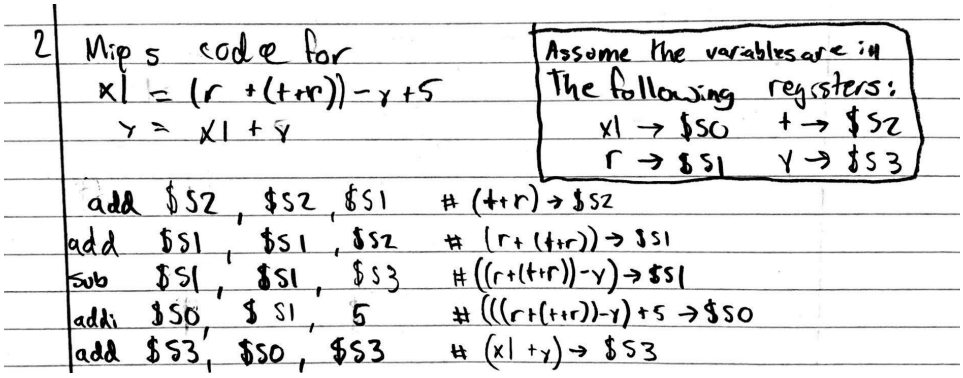
Homework 5

1. **Draw the memory layout for the word-sized (all elements are 4 byte wide) list, pixel = { 0x1000, 0x03, 0x56DD23FF}. The base address is 0x1FC0. [10]**



2. **Use minimum number of MIPS instructions (add, sub : see page 64 of textbook) and write the assembly code for the below Java/Python code expression. Assume all the variables are 32-bit data. You may choose any registers to hold the variable contents. [10 points] x1 = (r + (t + r)) – y + 5; y = x1 + y**



3. **Translate the Python code, A[5] = A[4] * 4 + B[3] , into MIPS assembly code. You may assume any register for base addresses and variables. [15 points]**

3 translate to mips

A[5] = A[4]*4 + B[3]

Assume A base address in $S0

Assume B base address in $T0

Assume A + B are word sized lists (4byte)

(offset, base address)

```
lw  $S1, 16($S0)     # load A[4] into $S1      offset = 4×4 = 16
lw  $T1, 12($T0)     # load B[3] into $T1      offset = 3×4 = 12
sll $S1, $S1, 2      # A[4] × 4 = A[4] × 2^2 → $S1
add $S2, $S1, $T1    # ((A[4]×4) + B[3]) → $S2
sw  $S2, 20($S0)     # store $S2 in A[5]       offset = 5×4 = 20
```