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Lab 9 TPS

- 1) Ok
- 2) Ok
- 3) Ok
- 4) The machine contains 16 bits
- 5) There are 4 types of instruction. They are arithmetic, logical, data transfer, and branches. Examples:

Arithmetic: add, sub

Logical: and, or

Data transfer: lw, sw

Branches: beq, bne, slt, j, jr, jal
- 6) Ok
 - a. The instruction type is I. This type has 4 fields. The name of these fields are opcode, rs, rt, immediate.
 - b. The value of the opcode of this is 8 hex. rs is \$zero register and the hex value is 0. rt is \$s0 register and its hex value is 0x1. The value of the immediate in hex is 0x1 hex.

c.

0x1000019

7) Ok

a. The machine code at this address is slt \$8,\$17,\$16 in binary it is:

0000 0001 0001 0001 1000 0000 0010 1010

b. The instruction type is branches. I know because the opcode is 0000 which means it branches. There are 6 fields in this instruction type opcode, rs, rt, rd, shamt, func.

c. 0x0111802A

d. The operation of this instruction is slt I know this because the op code is 0000 and the func is 2a.

e. Sd

8) Ok

a. It is in I format

b. Opcode is 5, rs is 0, rt is 0, and immediate is 1

c. The name of the target label is LESS. The address of this label is

0x000000001

d. We do not put this address as the immediate field because

- e. We find the value of the immediate value by looking at. This value is 1
- f. The binary for this is 0001 0100 0000 0000 0000 0000 0000 0001

And hex is 0x14000001

9) ok

- a. It is in j format, there are 2 fields
- b. The opcode is 2 hex
- c. It jumps to label GREQ and the address is 0x00400030
- d. You can use 26 bits in the address field. We can squeeze the address into this field by removing the first 4 digits and the last 2 digits in binary. The value of the address field in binary is 0000 0100 0000 0000 0000 0011 00
- e. Binary: 0000 1000 0001 0000 0000 0000 0000 1100

Hex: 0x0810000C