

(81)

1. (54 pts) Given that the below contents of the registers, give the results in the destination register:

AL: 10101010

BL: 11001011

CL: 10110111

a) AND AL, BL

AL: 10001010 ✓ OF: 0 ✓ CF: 0 ✓ SF: 1 ✓ ZF: 0 ✓ PF: 0 ✓

b) OR AL, BL

AL: 11101011 ✓ OF: 0 ✓ CF: 0 ✓ SF: 1 ✓ ZF: 0 ✓ PF: 1 ✓

c) XOR AL, CL

AL: 00011101 ✓ OF: 0 ✓ CF: 0 ✓ SF: 0 ✓ ZF: 0 ✓ PF: 1 ✓

d) NOT AL

AL: 01010101 ✓ OF: 0 ✓ CF: 1 ✓ SF: 0 ✓ ZF: 0 ✓ PF: 1 ✓

e) XOR AL, AL

AL: 00000000 ✓ OF: 0 ✓ CF: 0 ✓ SF: 0 ✓ ZF: 1 ✓ PF: 1 ✓f) TEST AL, 10010010b AL: 10101010 ✓ OF: 0 ✓ CF: 0 ✓ SF: 1 ✓ ZF: 0 ✓ PF: 1 ✓

10000010

2. (6) Write the instructions to turn ON the bit in position 3 (numbering 0 from right to left) of DL.

or DL, 00001000b ✓

3. (6) Write the instructions to turn OFF the bit in position 5 of DL.

and DL, 11011111b ✓

4. (8) Write the instructions that will jump to BIT5AND2 only if BOTH bits 5 and 2 are ON

TEST DL, 00100100b
jnz BIT5AND2 -4

5. (8) Write the instructions to jump to BIT5OR2 if only 1 of the bits 5 or 2 are on but NOT both.

TEST DL, 00100100b
jnz SKIP
TEST DL, 00100000b
jnz BIT5OR2

TEST DL, 00000100b

jnz BIT5OR2

SKIP:

if only 1 is on you'll jump to skip

6. (16) Suppose you know that the instruction `JE DONE` is at the address `04004040` and the equivalent machine instruction is

a) `742C`

What is the address of `DONE`?

$$\begin{array}{r} 04004040 \\ + 0000742C \\ \hline 0400B46C \end{array}$$

~~`0400B46Ch`~~

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b) `74CE`

What is the address of `DONE`

$$\begin{array}{r} 04004040 \\ + 000074CE \\ \hline 0400B50E \end{array}$$

~~`0400B50Eh`~~

7. (8) Write a single instruction that converts an uppercase character in `AL` to lowercase but does not modify `AL` if it already contains a lowercase letter.

`or AL, 00100000b` ✓

Good

8. (4) Which conditional jump instruction branches based on the contents of `ECX`?

`loop` ✓

8. BONUS (10 pts) Write a single instruction (other than `NOT`) that reverses ALL the bits in `AL`.

`xor AL, 11111111b` ✓

+10

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