

Homework 10

Due Wednesday, November 30

INSTRUCTION TIMES.

Read Chapter 3.4, Appendix D

Do Chapter 3 # 5ace, 8

X1. How many CPU cycles are required by the following instructions:

- | | | |
|----|--------|-----------|
| a. | ADD.B | #4, D0 |
| b. | MOVE.W | D0, (A0)+ |
| c. | CMP.L | (A0), D3 |
| d. | JSR | \$000B14 |

X2. On a 68000 based computer running at 8MHz, how long (in seconds) will the following loop take to run?

```

                MOVE.W    #$1000, D0
LOOP           SUBQ.W    #1, D0
                BNE      LOOP
  
```

X3. All of these loops fill memory from \$9000 to \$9FFF with \$FF's. Rank them from slowest to fastest:

* Method 1

```

                MOVE.L    #$9000, A0
LOOP           MOVE.B    #$FF, (A0)+
                CMP.L    #$A000, A0
                BNE      LOOP
  
```

* Method 2

```

                MOVE.L    #$9000, A0
                MOVE.L    #$A000, A1
                MOVE.L    #$FFFFFFFF, D0
LOOP           MOVE.L    D0, (A0)+
                CMP.L    A0, A1
                BNE      LOOP
  
```

* Method 3

```

                MOVE.L    #$9000, A0
                MOVE.W    #$A000, D0
LOOP           MOVE.L    #$FFFFFFFF, (A0)+
                CMP.W    A0, D0
                BNE      LOOP
  
```

```

* Method 4
    MOVE.L    #$9000,A0
    CLR.L     D0
    NOT.L     D0
    MOVE.W    #$400,D1
LOOP   MOVE.L    D0,(A0)+
    SUBQ.W    #1,D1
    BNE      LOOP

* Method 5
    MOVE.L    #$9000,A0
    MOVE.W    #$0FFF,D0
LOOP   MOVE.B    #$FF,0(A0,D0.W)
    SUBQ.W    #1,D0
    BNE      LOOP

* Method 6
    MOVE.L    #$9000,A0
    MOVE.L    #$A000,A1
    MOVE.L    #$FFFFFFFF,D0
LOOP   MOVE.L    D0,(A0)+
    MOVE.L    D0,(A0)+
    MOVE.L    D0,(A0)+
    MOVE.L    D0,(A0)+
    CMP.L     A0,A1
    BNE      LOOP

```

Bonus:

Write code that does the job faster than any of these methods.