# Exercise 5 Problems

Do NOT use a calculator on this assignment. You will not be allowed to use one on the test or quizzes.

1. Trace the following code fragments showing all registers used and the N, Z, V, and C bits. Instead of showing the PC, simply give the code line of the next instruction to execute.
   1. 1: LDD #$7F80

2: ADDB #$80

3: ADCA #$00

* 1. 1: LDD #$5678

2: ADDB #$88

3: ADCA #$A9

* 1. 1: LDD #$0002

2: ADDB #$FF

3: ADCA #$FF

* 1. 1: LDD #$00B0

2: ADDB #$50

3: ADCA #$00

* 1. 1: LDD #$FF80

2: ADDB #$80

3: ADCB #$00

* 1. 1: LDD #$7F7F

2: ADDB #$81

3: ADDA #$00

1. For each of the code fragments below, determine which of the 8 simple branches (BPL, BMI, BNE, BEQ, BVC, BVS, BCC, BCS) are taken, not taken, or cannot be determined. Note the Bxx is used to represent a generic branch instruction.

* 1. LDAA #$80

LSLA

Bxx 10

* 1. LDAA #$07

LSRA

Bxx 10

* 1. LDAA #$B3

ROLA

Bxx 10

* 1. LDAA #90

ASRA

Bxx 10

* 1. LDAB #$F0

LSLB

LSRB

Bxx 10

* 1. LDD #$8000

LSLD

ADCA #0

Bxx 10

* 1. LDAB #$C0

LSLA

ADCA #$90

Bxx 10

* 1. LDAA #$C0

LSRA

ADDA #$40

Bxx 10

* 1. LDAB #$7F

NEGB

Bxx 10

* 1. LDAA #$90

NEGA

Bxx 10

* 1. LDAA #$80

NEGA

Bxx 10

1. Determine the final contents of the register used in each code fragment.
   1. LDAA #%00111010

ANDA #%00110100

* 1. LDAB #%11010011

ANDB #%10101101

* 1. LDAA #%11110001

ORAA #%01101101

* 1. LDAB #%11001100

ORAB #%01011011

* 1. LDAA #%01111110

EORA #%10011001

* 1. LDAB #%11011101

EORB #%01111011

* 1. LDAA #%11001011

COMA

* 1. LDAB #%01110110

COMB

* 1. LDAA #%00110110

LSRA

LSRA

* 1. LDAA #%10010110

LSRA

LSRA

* 1. LDAA #%10010101

ASRA

ASRA

* 1. LDAA #%01100101

ASRA

ASRA

* 1. LDAA #%11000011

LSLA

LSLA

* 1. LDAA #%10100010

LSLA

LSLA

* 1. LDAA #%00110101

ASLA

ASLA

* 1. LDAA #%10101011

ASLA

ASLA

1. Perform the following functions using only a single line of assembly code. Assume that register X contains the value 1020h.
   1. Set bit 2 of 1000h to 1.
   2. Set bits 4, 5, and 7 of 1040h to 0.
   3. Set bits 1, 3, and 4 of 40h to 0.
   4. Set bits 0, 1, and 2 of 10AAh to 1.
   5. Branch to NEXT if bit 4 of 1040h is 1.
   6. Branch to NEXT if bits 3 and 4 of 1016h are 0.
   7. Branch to NEXT if bits 0, 1, 2, 3, and 4 of 1053h are 1.
   8. Branch to NEXT if bits 6 and 7 of 1005h are 0.
2. For each of the code fragments below, determine which of the 10 comparison branches (BHI, BHS, BLS, BLO, BGT, BGE, BLE, BLT, BNE, BEQ) are taken, not taken, or cannot be determined. Note the Bxx is used to represent a generic branch instruction.
   1. LDAA #$80

ASRA

CMPA #$80

Bxx 10

* 1. LDAA #$80

LSRA

CMPA #$80

Bxx 10

* 1. LDAB #$40

ASLB

CMPB #$80

Bxx 10

* 1. LDAA #$90

LSLA

ASRA

CMPA #$70

Bxx 10

* 1. LDAA #$50

COMA

CMPA #$B0

Bxx 10

* 1. LDAA #$9F

COMA

CMPA #$60

Bxx 10

* 1. LDAA #$27

NEGA

CMPA #$27

Bxx 10

* 1. LDAA #$27

NEGA

CMPA #$D9

Bxx 10