CS1021 Tutorial 4

Condition Code Flags

Q1 Translate following pseudo-code statement into a sequence of ARM assembly language instructions. Assume that x and y are signed integers and that x is in R1 and y in R2.

(i) if ((x == 0x30) || (x == 0x31) || (x >= 0x40)) {
    y = 1;
} else {
    y = 0;
}

(ii) if (((x >= 0x30) && (x <= 0x39)) || ((x >= 0x41) && (x <= 0x5a))) {
    y = 1;
} else {
    y = 0;
}

Q2 For each ARM Assembly Language code segment below, determine the value stored in R0 and the state of the N (Negative), Z (Zero), C (Carry) and V (Overflow) flags after the instructions have been executed

(i) LDR R0, =0x00000000
    LDR R1, =0x00000001
    ADDS R0, R0, R1

(ii) LDR R0, =0x00000001
    LDR R1, =0x00000000
    SUBS R0, R0, R1

(iii) LDR R0, =0x80000000
     LDR R1, =0x80000001
     ADDS R0, R0, R1

(iv) LDR R0, =0x00000000
    LDR R1, =0x00000000
    SUBS R0, R0, R1

(v)  LDR R0, =0x00000000
    LDR R1, =0x00000000
    ADDS R0, R0, R1

(vi) LDR R0, =0x80000000
     LDR R1, =0x80000000
     SUBS R0, R0, R1
(vii) LDR R0, =0x80000000
    LDR R1, =0x80000000
    ADDS R0, R0, R1

(viii) LDR R0, =0x80000000
    LDR R1, =0x00000000
    SUBS R0, R0, R1

Q3 If x and y are signed 64-bit integers in R0:R1 and R2:R3 respectively and z is an integer in R4, translate the following pseudo-code statements into a sequence of ARM assembly language instructions

(i) if (x == y) {
    z = 1;
} else {
    z = 0;
}

(ii) if (x < y) {
    z = 1;
} else {
    z = 0;
}