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   *0x00000001 N = 0, Z = 0, C = 0, V = 0 (0)*

(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;
      }