HW2

1) $X_{11} \leftarrow \&A[f+1]$

$X_9 \leftarrow A[f+1]$

$X_{10} \leftarrow \&B[g+2]$

$X_9 \leftarrow A[f+1] + A[f]$

$B[g+2] \leftarrow A[f+1] + A[f]$

2)

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1. ORR    X10, XZR, XZR          i=0
2. LoopI: SUBS   XZR, X10, X0
3.        B.GE   ENDI
4.        ORR    X11, XZR, XZR   j=0
5. LoopJ: SUBS   XZR, X11, X1
6.        B.GE   ENDJ
7.        LSL    X13, X10, #6    handles 8*i as well as x8 for the word size
8.        LSL    X13, X10, #1    X13 = 2i
9.        LSL    X14, X11, #1    X14 = 2j
10.       ADD    X14, X14, X14   X14 = 3j
11.       ADD    X15, X13, X14   X15 = 2i + 3j
12.       STR    X15, [X12, #0]
13.       ADDI   X11, X11, #1
14.       B      LoopJ
15. ENDJ: ADDI   X10, X10, #1
16.       B LoopI
17. ENDI:
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3. a) $(1100010101001000)_2 = (120222120)_4 = (305230)_8 =$ $(18a98)_{14}$

b) $+37 = 32+4+1 \Rightarrow 00100101$

- S.M → 10100101
- 1's Complement → 11011010 (1)
- 2's complement → 11011011

c) number = 10101100 (value) → negative

SM. $2^2+2^3+2^5 = 4+8+32 = 44$ SM $\Rightarrow -44$

1's Complement $\Longrightarrow$ 01010011 $\rightarrow 2^0+2^1+2^4+2^6 = 1+2+16+64 = 83$

1's complement $\Longrightarrow -83$

2's Complement $\Longrightarrow$ 01010100 $\rightarrow 2^2+2^4+2^6 = 64+16+4 = 84$

2's complement $\Longrightarrow -84$

d) $+14 = 8+4+2 \longrightarrow 001110$

$+18 = 16+2 \longrightarrow 010010$

S.M $-14 \longrightarrow 101110$

$-18 \longrightarrow 110010$

$\not{X}\ 100000$ represent $-0 \Longrightarrow$ This is not correct!

1's complement:

$$\begin{array}{r} 110001 \\ +\ 101101 \\ \hline \not{X}\ 011110 \end{array}$$ not correct!

↓

S.B is zero! The result of adding two negative numbers is positive!

2's Complement:

$$\begin{array}{r} 110010 \\ +\ 101110 \\ \hline \not{X}\ 100000 \end{array}$$ two's complement $\longrightarrow -32$

Correct result