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ELC 411-01
Homework #4

4.2:

r0 = 0x0F0F0F0F

r1 = 0xFEDCBA98

1.EOR r3, r1, r0

Performing r1 XOR r0 yields:

0 XOR F=F

F XOR E=1111 XOR 1110=0001=1

0 XOR D=D

F XOR C=1111 XOR 1100=0011=3

0 XOR B=B

F XOR A=1111 XOR 1010=0101=5

0 XOR 9=9

F XOR 8=1111 XOR 1000=0111=7

r3=0xF1D3B597

2.ORR r3, r1, r0

Performing r1 OR r0 yields:

0 OR F=F

F OR E=1111 OR 1110=1111=F

0 OR D=D

F OR C=1111 OR 1100=1111=F

0 OR B=B

F OR A=1111 OR 1010=1111=F

0 OR 9=9

F OR 8=1111 OR 1000=1111=F

r3=0xFFDFBF9F

3.AND r3, r1, r0

Performing r1 AND r0 yields:

0 AND F=0

F AND E=1111 AND 1110=1110=E

0 AND D=0

F AND C=1111 AND 1100=1100=C

0 AND B=0

F AND A=1111 AND 1010=1010=A

0 AND 9=0

F AND 8=1111 AND 1000=1000=8

r3=0x0E0C0A08

4.BIC r3, r1, r0

Performing r1 AND NOT r0 yields:

F AND NOT 0=F

E AND NOT F=0

D AND NOT 0=D

C AND NOT F=0

B AND NOT 0=B

A AND NOT F=0

9 AND NOT 0=9

8 AND NOT F=0

r3=0xF0D0B090

5.BFI r3, r1, #4, #8

r3=0x0008

6.MVN r3, r1

NOT F=0

NOT E=0001=1

NOT D=0010=2

NOT C=0011=3

NOT B=0100=4

NOT A=0101=5

NOT 9=0110=6

NOT 8=0111=7

r3=NOT r1=0x01234567

7.MVN r3, r0

r3=NOT r0=0xF0F0F0F0

ADD r3, r1, r3

r1=0xFEDCBA98

$8+0=8$
 $F+9=1111+1001=1000=8+\text{carry}$
 $A+0=A+\text{carry}=B$
 $F+B=1111+1011=1010=A+\text{carry}$
 $C+0=C+\text{carry}=D$
 $F+D=1111+1101=1100=C+\text{carry}$
 $E+0=E+\text{carry}=F$
 $F+F=1111+1111=1110=E$

$r3=r1+r3=0xEFCDAB88$

4.4:

MUL r1, r0, r1; //r1=x*y
 ADD r2, r1, r2; //r2=x*y+z
 SUB r0, r2, r1//r0=r2-r1=x*y+z-x

4.6:

MUL r2, r0, r0; //r2=x*x
 MUL r3, r2, r0; //r3=x*x*x
 MUL r4, r3, #3; //r4=3*x*x*x
 MUL r5, r2, #7//r5=7*x*x
 MUL r6, r0, #10//r6=10*x
 SUB r7, r4, r5//r7=3*x*x*x-7*x*x
 ADD r8, r7, r6//r8=3*x*x*x-7*x*x+10*x
 SUB r1, r8, #11//r1=3*x*x*x-7*x*x+10*x-11

4.10:

$r0=0x12345678$

AND r1, r0, #0xFF000000; //r1=0x12000000
 AND r2, r0, #0x00FF0000; //r2=0x00340000
 AND r3, r0, #0x0000FF00; //r3=0x00005600
 AND r4, r0, #0x000000FF; //r4=0x00000078

LSR r1, r1, #6//r1=0x00000012
 LSR r2, r2, #2//r2=0x00003400
 LSL r3, r3, #2//r3=0x00560000
 LSL r4, r4, #6//r4=0x78000000

ADD r1, r1, r2//r1=0x00003412
 ADD r3, r3, r4//r3=0x78560000
 ADD r0, r1, r3//r0=0x78563412

5.1:

- a. For little endian, r1=0x1A, but if it is big endian r1=0xA1
- b. LDR r1, [r0, #4] //r1=0x79CDA3FD
 LDR r1, [r0], #4 //r1=0DEB2C1A
 LDR r1, [r0, #4]! //r1=0x79CDA3FD

5.3:

	r0	r1
STR r1, [r0], #4	0x20000004	0x5678
STR r1, [r0, #4]!	0x20000008	0x1234
STR r1, [r0, #4]	0x20000008	0x5678

5.5:

1. LDRSB r1, r0; //r1=0xFFFFF3C3
2. LDRSH r1, r0; //r1=0xFFFFC3D4
3. LDRB r1, r0; //r1=0x000000C3
4. LDRH r1, r0; //r1=0x0000C3D4