Tyler McKean

ENGIN 446

April 17, 2021

**Homework 5**

1. Problem 9.21

**31-28 25 24-21 20 19-16 15-12**

**Instruction cond 27-26 I cmd S Rn Rd 11-0 Equivalent Hex**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ADD R1, R0, #18 | 1110  E | 00 | 1  2 | 0100  8 | 0 | 0000  0 | 0001  1 | 0000 00010010  012 | E2801012 |
| ADD R6, R0  2 ror 1 | 1110  E | 00 | 1  2 | 0100  8 | 0 | 0000  0 | 0110  6 | 0001 00000010  102 | E2806102 |
| MOV R8, R2  LSL #4 | 1110  E | 00 | 0  1 | 1101  A | 0 | 0000  0 | 1000  8 | 0010 00000010  202 | E1A08202 |
| EOR R2, R1, #24 | 1110  E | 00 | 1  2 | 0001  2 | 0 | 0001  1 | 0010  2 | 0000 00011000  018 | E2212018 |
| LDR R1,  [R2, R3, LSL#2] | 1110  E | 01 | 1  7 | 1100  9 | 1 | 0010  2 | 0001  1 | 0100 00000011  403 | E7921403 |

1. Problem 9.22

**31-28 25 24-21 20 19-16 15-12**

**Instruction cond 27-26 I cmd S Rn Rd 11-0 Equivalent Hex**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| LDR R11,[R1,R2] | 1110  E | 01 | 1  7 | 1100  9 | 1 | 0001  1 | 1011  B | 0000 00000010  002 | E791B002 |
| STR R8, 4(R0) | 1110  E | 01 | 0  4 | 0100  8 | 0 | 0000  0 | 1000  8 | 0000 00010000  010 | E4808010 |
| SUB R6,  R1, R2 LSR#1 | 1110  E | 00 | 1  2 | 0010  4 | 0 | 0001  1 | 0110  6 | 0001 00110010  132 | E2416132 |
| LDREQ R10,  [R0, #4] | 0000  0 | 01 | 0  5 | 1100  9 | 1 | 0000  0 | 1010  A | 0000 00000100  004 | 0590A004 |
| BNE -4 | 0001  1 | 10 | 1  A | 0111  F | 1 | 1111  F | 1111  F | 1111 11111100  FFC | 1AFFFFFC |

1. Problem 9.24

**31-28 25 24-21 20 19-16 15-12**

**Equivalent Hex cond 27-26 I cmd S Rn Rd 11-0 Instruction**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E2202012 | 1110  E | 00 | 1  2 | 0001  2 | 0 | 0000  0 | 0010  2 | 0000 00010010  012 | EOR R2, R0 #18 |
| E2806102 | 1110  E | 00 | 1  2 | 0100  8 | 0 | 0000  0 | 0110  6 | 0001 00000010  102 | ADD R6, R0, #2 ROR #1 |
| 1A000001 | 0001  1 | 10 | 1  A | 0000  0 | 0 | 0000  0 | 0000  0 | 0000 00000001  001 | BNE 1 |
| E691B002 | 1110  E | 01 | 1  6 | 0100  9 | 1 | 0001  1 | 1011  B | 0000 00000010  002 | LDR R11, [R1, R2] |
| E48030A8 | 1110  E | 01 | 0  4 | 0100  8 | 0 | 0000  0 | 0011  3 | 0000 10101000  0A8 | STR R3, 42(R0) |

1. Problem 9.25

**31-28 25 24-21 20 19-16 15-12**

**Equivalent Hex cond 27-26 I cmd S Rn Rd 11-0 Instruction**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| E480B0C8 | 1110  E | 01 | 0  4 | 0100  8 | 0 | 0000  0 | 1011  B | 0000 10111000  0C8 | STR R11, 50(R0) |
| 0A000001 | 0000  0 | 10 | 1  A | 0000  0 | 0 | 0000  0 | 0000  0 | 0000 00000001  001 | BEQ 1 |
| 0490A004 | 0000  0 | 01 | 0  4 | 0100  9 | 1 | 0000  0 | 1010  A | 0000 00000100  004 | LDREQ R10, [R0, #4] |
| E2806102 | 1110  E | 00 | 1  2 | 0100  8 | 0 | 0000  0 | 0110  6 | 0001 00000010  102 | ADD R6, R0, #2 ROR #1 |
| E3A07001 | 1110  E | 00 | 1  3 | 1101  A | 0 | 0000  0 | 0111  7 | 0000 00000001  001 | MOV R7, #1 |