
CSE211s Introduction to Embedded Systems

Spring 2023

Sheet 3

Introduction to Embedded Systems

For these questions remember to consult to the ARMv6 Architecture Reference Manual when in doubt.

1. How does the word 0xdec0ded1 appear in memory in a little-endian memory system and a big-endian memory system.
2. Is the Freescale Kinetis series of ARM Cortex processors little-endian or big-endian?
3. Does the stack grow toward larger or smaller addresses?
4. Assuming that SP is 0x0000_2220 initially, what is its value after executing the instruction PUSH {r0,r2}?
5. Assuming that SP is 0x0000_2010 initially, what is its value after executing the instruction POP {r0-r7,PC}?
6. Write the Thumb code to add five to the contents of register r6.
7. Write the Thumb code to subtract 1000 from the contents of register r6, using r3 as a temporary register.
8. Write the Thumb code to multiply the two 32-bit in memory at addresses 0x1234_5678 and 0x7894_5612, storing the result in address 0x2000_0010.
9. Write the Thumb code to load register r0 with the letter 'E' if the number in r12 is even, or else the letter 'O' if it is odd.
10. Why would you use a BLX instruction rather than a BX instruction?
11. Why would you use a BL instruction rather than a BLX instruction?
12. Write the thumb code to call a subroutine at address 0x6555_8888. Where is the return address located?