Texas Instruments Robotics System Learning Kit
Module 10
Activity: Debugging Real-time Systems
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Question 1
Write C code that dumps Port 4 input and Port 5 output into arrays.
Define two 8-bit arrays of length 1000.

void Debug_Init(void);
void Debug_Dump(void);

Question 2
Write C code that dumps four 8-bit parameters into a single array. Pack
the four 8-bit numbers with w as the most significant byte and z as the
least significant byte. Define one 32-bit array of length 1000.

void Debug_Init(void);
void Debug_Dump(uint8_t w, uint8_t x, uint8_t y, uint8_t z);

Question 3
Analyze the following two implementations of a debugging dump. The
first uses an index access and the second uses pointer access. What
can you say about the relative intrusiveness of the two implementations?

In each case, identify the assembly instruction that actually writes data
into the buffer.

Question 4
Write a C program that maintains the time in hours, minutes and seconds
using SysTick interrupts. Basically update these three global variables.
Assume some other software initializes them to the correct time.

uint8_t Hour; // 0 to 23
uint8_t Minute; // 0 to 59
uint8_t Second; // 0 to 59

Question 5
List the steps required if one wished to change one bit of ROM from
a 0 to a 1. Assume this is an arbitrary address and arbitrary bit. Assume
the address is not within the ROM containing the software code.
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