EE 354
ARM Lecture 5
Review

1. What are the three stages of the ARM Pipeline?

2. How is a branch instruction handled by the pipeline?

3. The ARM is a load and store architecture. What does this mean?

4. Explain the difference between the following two C statements for the ARM processor.
   \[ \text{IOPIN1} = 0x55550000; \quad \text{IOSET1} = 0x55550000; \]

5. What is the MAM with respect to the LPC2138? Explain how it works.

6. What is the difference between an ARM instruction and a THUMB instruction?

7. What is the purpose of the phase locked loop on the ARM processor?

8. What are the general characteristics of RISC processors?

9. How does a barrel shifter work?

10. For the usual C program for the system we are using (LPC2138) how are the special function registers defined?

11. On reset how are the GPIO pins defined on the ARM? Why?

12. For the Keil ARM environment what is the significance of the Startup file which can be appended to each C program?

13. ARM machine code has the format shown in the figure below. The instructions are all the same length and have a uniform format. Why?

![Figure 7: Instruction Set Summary](image-url)
14. There are four registers associated with GPIO: IODIR, IOSET, IOCLR, and IOPIN. Explain what the function of each of these is.

15. How is the THUMB register set different from the ARM register set? Why is it necessary to have two different register sets?

16. When combining an assembly module with a C module how are parameters passed?

Sample programming problems:
1. The ARM 7 board used for this class has an output connector labeled CN1. Write a C program to copy the lower nibble bits of this port to the upper nibble bits. (P1. 28 to P1.31) to (P1.24 to P1.27)

2. Write a C program to initialize the D to A converter and output a square wave to the converter as fast as possible.

3. Write a C program to initialize the D to A converter and output a sine wave to the converter as fast as possible.