Helwan University
Faculty of Engineering – Computer and Systems Engineering
Embedded Systems - ARM

Lab[01]- ARMv7 assembly

1. Write an ARM7 assembly program that does the following:
    a. Loads the decimal value 255 into register R0.
    b. Stores the content of R0 into memory location 0x20000000.
    c. Loads the content of memory location 0x20000004 into register R1

2. . Write an ARM7 assembly program that:
    a. Declares an array of 5 bytes named myArray and initializes it with values 1, 2, 3, 4, 5.
    b. Loads the 3rd element of myArray into register R3.
    c. Adds the value 10 to the 3rd element of myArray.

3. Write an ARM7 assembly program that copies a string from source memory location to destination memory location:
    a. Define two strings: source initialized with "Hello" and destination with 5 bytes of space.
    b. Copy the string "Hello" from source to destination byte-by-byte transfer.

4. Register Based Offset Addressing
    a. Load the value at the memory location array + 4 into r7.
    b. Store the value in r2 at the memory location array + 8.

5. **LabTask:** Pre-Indexed Addressing
    a. Assume you have an array starting at address 1000H pointed by r0.
    b. Load the value at the memory locations starting from 1000H to 1008H into R8, R9, R10. use *post-indexed addressing*
    c. Store the value in r2, r3 and r4 at the memory locations starting from 1008H, down to1000H. Use pre-indexed addressing

6. **LabTask:** Mixed Addressing Modes
    a. Write a code snippet that calculates the sum of elements in an array assuming the array size is stored in r1. Store the result in r12.