Level 1- Banana Problem

Rules:

1.Execute The first two problem statements in ARM Simulator

Submission mode: A pdf containing SRN, Name, Screenshot of output in ARM simulator(Questions 1 and 2).

Submission mode: Google form/Microsoft teams

Deadline: 10PM

Write in Blue book Question 3 and 4

Deadline: 5PM

Set 1:

1. Problem statement: write an ARM assembly program to evaluate a postfix expression using stack. The program should support the basic arithmetic operations: addition (+), subtraction (-).The operands will be single-digit integers (1-9).

   Input Format:

   The postfix expression will be represented as an array of characters (i.e., a string). The expression should terminate with a null character ('\0'), indicating the end of the string.

   Output Format:

   The program will output the result of the postfix evaluation.

   Assumptions:

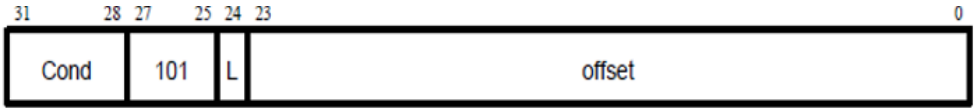
   - The operands are non-negative single-digit integers.
   - The expression contains no spaces.
   - The expression is well-formed, meaning there are no errors in the input (e.g., mismatched operators or operands).

2. Problem statement : implement the **Bubble Sort** algorithm in ARM Assembly language to sort an array of integers in ascending order. The Bubble Sort algorithm repeatedly steps through the list, compares adjacent elements, and swaps them if they are in the wrong order. This process continues until the array is sorted.
   Input:
   - An array of integers stored in memory. The array will have N elements, where N is the size of the array. Each element is a single integer.
   - The size of the array N will be provided as part of the input.
   Output:
   - The array will be sorted in ascending order. The program will output the sorted array.
   Constraints:
   - The elements in the array are integers.

- The program will handle sorting a small array. Student can define the array and array size (5 to 10 elements)

3. What is the hexadecimal representation of the instruction “BEQ Assignment”. Indicate the address of all instructions in program. Assume the starting address of program as 0X0000103C. Given

Instruction format and condition code for always=1110 and EQ=0000




```
.text
mov r1, #3
BEQ  assignment
add r2, r0, r1
add r2,r0,r1
 add r0,r0,#1 swi 0x011
Assignment:
        mov r0, #2
        bx lr
.end
```

4. Describe the process used for passing parameter in the ARM procedure call. Using an ALP procedure call standard, write a subroutine MAX that takes two parameters a and b and returns the larger of the two.