BIRZEIT UNIVERSITY

Electrical and Computer Engineering

Computer Organization and Microprocessors – ENCS2380

Assembly Assignment

Summer 2022

Deadline: **Monday 29/8/2022**

Instructions:

- It should be an Assembly program, written entirely from scratch by you, satisfying the requirements specified below.
- This assignment is individually work, so every student has to submit his/her own solution and be ready for discussion.
- It is very important that you write easily readable, well-designed, and fully commented code [You must organize your code using procedures].
- No late submission will be accepted.

Assignment:

Use Keil uvision 5 software to develop an ARM assembly program with the followings specifications:

a) Declare an array of at least 10 signed integer numbers in the memory with initial values.

e.g. 34, -56, 27, -5, 38, 5, -46, -2, 17, -1

b) Find the sum of all elements of the array and store it in the memory, e.g. variable SUM.

c) Find the sum of the positive numbers SUMP, and sum of the negative numbers SUMN. Store them in the memory variables SUMP: and SUMN.

d) Assume this array is samples of a discrete signal, Find the energy (E) of this signal,

$$E = \frac{1}{N}\sum_{i=0}^{N-1} x_i^2$$

Where, N is the array length, and xi is the sample array[i].

Store the Energy value in the memory variable ENERGY.

e) Find the Zero-Crossing Count (ZCC) of the array. You can compute the ZCC by counting the number of times the samples of the array change their signs. For example, for an array A = {1,-2,3,-4,5,6}, the ZCC is 4, i.e. the samples cross zero-axes 4 times.

Store the ZCC value in the memory variable ZCC,