BLG212E - MICROPROCESSOR SYSTEMS
HOMEWORK-1

Assignment : 27/10/2022 Due Date : 17/11/2022 at 23:59

Write an Assembly program (using the EDU-CPU instruction set and Mikbil simulator) to do followings.

- Define an array variable named **ARRAY**, whose length is 20 bytes.
- Beginning memory address of ARRAY is $0000, and each element is 1 byte.
- Initialize the ARRAY with the following decimal data. (They are already sorted in increasing order).
  10, 10, 20, 20, 20, 30, 40, 40, 40, 40, 40, 60, 60, 70, 70, 70, 70, 90, 90, 90
  Alternatively, you may initialize the array with the following hexadecimal data equivalents :
  $0A, $0A, $14, $14, $14, $1E, $28, $28, $28, $28, $28, $3C, $3C, $46, $46, $46, $46, $5A, $5A, $5A
- By looping, calculate the frequencies (number of repeats) of each data item in the ARRAY.
- Store the calculated frequencies along with their data in another array named **FRARRAY** (Frequencies Array), which has the following structure.

Data1
Frequency1
Data2
Frequency2
. . . .

- You should define the FRARRAY with maximum 40 bytes, each element is 1 byte.
  (Beginning memory address of FRARRAY will be immediately after the end of the ARRAY.)
- The followings are the expected results in the FRARRAY, shown as decimal numbers.
  10, 2, 20, 3, 30, 1, 40, 5, 60, 2, 70, 4, 90, 3
- In your program, you may define other additional variables if needed.

EXAMPLE OF EDU-CPU MEMORY
(Shown as Hexadecimal numbers)

ARRAY (Used as source)	
0A	→ Data
0A	→ Data
14	→ Data
14	→ Data
14	→ . . .
1E	
28	
28	
28	
28	
28	
3C	
3C	
46	
46	
46	
46	
5A	
5A	
5A	

FRARRAY (Used as target)	
0A	→ Data1
02	→ Frequency1
14	→ Data2
03	→ Frequency2
1E	→ . . .
01	
28	
05	
3C	
02	
46	
04	
5A	
03	