CSC 3210 – Assignment #3

Spring 2022

**Objective:** Learn memory organization/layout, data transfer concepts and instructions, direct memory access, memory allocation.

**Requirements:**

## (5 points) Use a loop instruction with indirect addressing to solve the problem.

* + Do not copy the elements to any other array.
  + Use the LOOP and XCHG instruction.
  + The input array*, inputStr* contains elements: “A”, “B”, “C”, “D”, “E”, “F”, “G”, “H”.
  + The array’s elements after running the program should look like: “G”, “H”, “E”, “F”, “C”, “D”, “A”, “B”.

## Submit the following:

* + - * Rename the asm file using your last name as Lastname1.asm
      * Screenshot of the code and memory window showing the content of the variable *inputStr*.

Graphical user interface, text

Description automatically generated

# (5 points) Write an assembly program that does the following:

* + Define the following value **0506-0307-0408-0102h** in the .data segment using the 64-bit unsigned identifier named qVal.

# You can subdivide the qVal value into 4 words – 0506, 0307, 0408, 0102

* + **Extract these words from qVal using PTR operator.**
  + Find the sum of the words. The sum should be D17h.
  + Store the result in any 16-bit register.
  + The direction of adding two words goes from left to right.

## Submit the following:

* + - * Rename the asm file using your last name as Lastname2.asm
      * Screenshot of the code and memory window showing the result in a 16-bit register.

A screenshot of a computer

Description automatically generated with medium confidence

## (5 points) Consider the following code:

if (var1 > var2) OR (var3 < var2){ var1 = var2 + var3;

var2++; var3++;

}

else{

var1--;

var2--;

var3--;

}

* + Here var1, var2 and var3 are DWORD variables.
  + var1 is initialized with 10 (decimal), var2 is initialized with 11(decimal) and var3 is initialized with 12 (decimal).
  + Translate the following code in assembly code (MASM).
  + You need to implement the logic of the if-else statement with compound condition.
    - **Submit the following:**
      * Rename the asm file using your last name as Lastname3.asm
      * Screenshot of the code and register window

Graphical user interface, text

Description automatically generated

**Note:**

* **Comment header** for .ASM files:

Student: Full name Class: CSC3210 Assignment#: 3

Description: This program ………….

* Follow the program standards as presented in your book. Pay more attention to code comments and consistent indentation.
* Create a new project for every question. Do not use one project with multiple .asm files.