CPSC 240: Computer Organization and Assembly Language

Assignment 04, Fall Semester 2024

CWID:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Programming:**

1. Download the “CPSC-240 Assignment04.docx” document.
2. Design "multiple.asm" program to implement an if-else structure in assembly language, and use assembly language to realize the function of the following C++ instructions. NOTE: variable sizes and program functions should be equivalent to C/C++ instructions.  
   unsigned short num = 65535; // use dw to declare 16-bit variable  
   unsigned short mul\_3 = 0, other = 0; // use dw to declare 16-bit variable  
   if(num % 3 == 0 && num % 5 != 0) {  
    mul\_3++;  
   } else {  
    other++;  
   }
3. Assemble the "multiple.asm" file and link the "multiple.o" file to get the "multiple" executable file.
4. Run the "multiple" file with the GDB debugger to display the memory of num, as well as the simulation results of mul\_3 and other.
5. Insert source code (multiple.asm) and simulation results (GDB window) of the memory (num, mul\_3, and other) in the document. Write an analysis to verify simulation results.
6. Save the file in pdf format and submit the pdf file to Canvas before the deadline.

[Insert multiple.asm source code here]

[Insert multiple simulation result here]

[Insert the simulation result verification here]