**Computer Science Department**

**California State University, Fullerton**

CPSC 240 Computer Organization and Assembly Language

Quiz 02

1:00 pm to 2:15 pm

Thursday, March 21, 2024

Student Name:

Last 4 digits of ID:

**Note:**

* University regulations on academic honesty will be strictly enforced.
* You have 75 minutes to complete this Quiz.
* Open books, slides and sample programs.
* Turn off or turn vibration your cell phone.
* Use “yasm/nasm” assembler to assemble the source code.
* Use “ld” linker to link the object code
* Use “ddd/gdb” debugger to simulate the executable code.
* Each student can only submit solution once, and secondary submissions will not be graded. If you have submitting problems, please inform your instructor before you leave the classroom.
* Any content submitted after the due date will be regarded as a make-up quiz.

Quiz 02

1. Download the “CPSC-240-01 Quiz 02.docx” document.
2. Write an assembly program to sum the negative odd numbers in shortArr. The corresponding C/C++ program is as follows.
3. Convert the following C/C++ program to x86-64 assembly language.
4. Use the “yasm/nasm” assembler to assemble the program, the “ld” linker to link the object code, and the “ddd/gdb” debugger to simulate the executable code.   
   NOTE: variable sizes and program functions should be equivalent to C/C++ instructions.

signed short shortArr[10] = {-3012, 623, -1234, 2345, 3456, 1267, -89, 6232, -231, 0};

signed short evenSum;

register long rsi = 0 //64-bit register

register long rdi = 0 //64-bit register

while (num[rsi] != 0) {

if(shortArr[rsi] < 0 && shortArr[rsi]%2 == 0) {

evenSum += shortArr[rsi];

}

rsi++;

}

1. After assembling and linking, run the DDD/GDB debugger to display the simulation result values of shortArr and evenSum in GDB window.
2. Insert source code and the simulation results (GDB window) to the bottom of the document.
3. Save the file in pdf or docx format and submit the pdf or docx file to Canvas before the deadline.
4. Deadline is 2:15 pm on 3/21/2024.

[Attach your assembly source code here:]

[Attach GDB window with all variable results here:]