**Fall 2016 - Midterm Reinforcement**

This assignment may add up to 15 points to your midterm exam score. **You must complete the entire assignment to receive any credit.** You must show your work to receive credit. This is an individual assignment- do not discuss it with other class members. Please see the instructor about questions you may have.

Compute the 16-bit sum of 0x1B8616 + 0x147A16 without converting to binary or decimal. (2.5 points)

Do the 16-bit subtraction of 0x1B8616 - 0x147A16 without converting to binary or decimal. (2.5 points)

Convert the true multiplication of ACE16 X 3416 without converting to binary or decimal. (2.5 points)

What is the result of the previous multiplication as a 12-bit unsigned integer?

(2.5 points)

Assembly Coding (5 points)

Perform the following assembly instructions and give the final state of the machine’s registers and memory. Memory addresses are given in hexadecimal, memory values are given in decimal. (21 points – 3 per location)

Registers: Memory:

|  |  |
| --- | --- |
| 0x1000 | 2010 |
| 0x1004 | 3010 |
| 0x1008 |  |
| 0x100C |  |
| 0x1010 |  |
| 0x1014 |  |

|  |  |
| --- | --- |
| EAX |  |
| EBX |  |
| ESP |  |

Code:

movl $0x1000, %esp

movl (%esp), %eax

addl (%esp), %eax

movl 4(%esp), %ebx

mull 4(%esp), %ebx

movl %eax, 16(%esp)

movl %ebx, 20(%esp)

mull %ebx, %eax

movl %eax, 8(%esp)