

UNCA CSCI 235
Exam 1 Spring 2019
1 April 2019

This is a closed book and closed notes exam. Communication with anyone other than the instructor is not allowed during the exam. **Furthermore, calculators, cell phones, and any other electronic or communication devices may not be used during this exam.** Anyone needing a break during the exam must leave their exam with the instructor. Cell phones or computers may not be used during breaks.

This exam must be turned in before 6:55 PM.

Name: _____

Problem 1 (30 points) C expressions

In the left column, there are fifteen and not-so tricky C expressions. Write their values in the right column. Express your answers in simple base 10 expressions, such as 235 or -235. You may assume that all of these numbers are stored in 16-bit two's complement representation, the usual short.

0235	
0x5A	
21 / 5 * 4	
21 * 5 / 4	
21 && 14	
21 & 14	
21 14	
21 ^ 14	
21 >> 2	
21 << 2	
21 > 2	
21 < 2	
! -21	
~21	
5 * (14 == 14) + 3	

Problem 2 (16 points) Decimal to two's complement conversion

Convert the following four signed decimal numbers into **five-bit two's complement** representation. Some of these numbers may be outside the range of representation for **five-bit two's complement** numbers. Write "out-of-range" for those cases.

35	-16
16	-5

Problem 3 (16 points) Q4.4 to decimal conversion

Convert the following four Q4.4 *two's complement* numbers (four fixed and four fractional bits) into signed decimal representation.

01000010

01100000

10001000

10010010

Problem 4 (12 points) Decimal to Q4.4 conversion

Convert the following three signed decimal numbers into Q4.4 *two's complement* numbers (four fixed and four fractional bits). If you can't express the number exactly, give the nearest Q4.4 representation.

-5.0

0.1

3.14159

Problem 5 (4 points) Tools of the trade

Answer the following three questions.

What component was wired in series to an LED when we used the Arduino?
(Hint: It *limits* current.)

What does the tar.gz at the end of the filename lab.tar.gz mean?

To keep harmony within the Department of Computer Science, what do we **always** do at the end of a lab?

