CS 201 (David Gerhard): Introduction to Digital Systems


David Gerhard

a4

Submit to urcourses, in PDF, DOC(X), or text format. PDF is preferred. Be sure to follow all assignment expectations.

Question 1

For each of the following expressions, represent the two numbers in 2's complement representation (n = 8), perform the operation, and verify the result in binary and in base 10:

(a) 28 + 91

(b) 102 - 75

(c) 12 * -5 (product may require 16 bits)

(d) 240 / 10 (may need quotient and remainder)

Question 2

Given A = -12 and B = -10 in 2's complement representation (n = 5), in which of the following cases does overflow occur? Why or why not?

(a) A + B

(b) A - B

(c) -A + B

(d) -A - B

Question 3

(a) What is the difference between logical shift, arithmetic shift, and rotate?

(b) Although most processors provide functionality for both arithmetic and logical shift right, Most processors do not provide arithmetic shift left, or if they do, it is equivalent in functionality to logical shift left. Explain, in your own words, why this is the case. You may want to do some research.

(c) For unsigned numbers, using a logical shift left is the same as multiplying by 2, and a logical shift right is the same as dividing by two (with a remainder). Explain why using arithmetic shift right to divide by two can be problematic for signed numbers.

Assignment deliverables:

all files must have the indicated filenames (replace 200200000 with your student number):

1. Assignment file named “A4_200200000.docx” or “A4_200200000.pdf” containing your complete solution for all questions

Submission status

Submission status	Submitted for grading
Grading status	Graded
Due date	Friday, 4 November 2016, 11:55 PM
Time remaining	Assignment was submitted 5 hours 33 mins early
Last modified	Friday, 4 November 2016, 6:21 PM
File submissions	A4_200312488.pdf
Submission comments	Comments (0)

Feedback

Grade	24.00 / 30.00
Graded on	Wednesday, 9 November 2016, 2:44 PM
Graded by	Zhi Cao
Annotate PDF	Mandeep Singh_688234_0.pdf View annotated PDF...

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