COMP 252: Computer Architecture & Organization

Spring 2019

Homework 2

Released: 02/08/2019

**Instructions:** *for a total of 100 points (20 points each), solve these exercises from the book while following the bit-level integer coding rules outlined on* *pages 128-129:*

1. 2.61
   1. !~x
   2. !x
   3. !~(x | ~0xff)
   4. !((x >> ((sizeof(int) - 1) << 3)) & 0xff)
2. 2.64

Int any\_odd\_one(unsigned x) {

return !!(x & 0xAAAAAAAA);

}

1. 2.65

int odd\_ones(unsigned x) {

temp = x>>16;

x = x^temp;

temp = x>>8;

x = x^temp;

temp = x >> 4;

x = x^temp;

temp = x>>2;

x = x^temp;

temp = 0x01;

x = x&temp;

return x;

}

1. 2.68

int lower\_one\_mask(int n) {

int w = sizeof(int);

w = w << 3;

return (unsigned) -1 >> (w - n);

}

1. 2.69

unsigned rotate\_left(unsigned x, int n) {

int w = sizeof(unsigned);

w = w << 3

return x << n | x >> (w - n - 1) >> 1;

}

**Rubric:** The points for this homework are awarded according to the following weights:

Correct: 100%

Minor Error: 70%

Major Error: 50%

Started Correctly: 30%

Everything else: no credit

**Acceptable document formats include Microsoft Word or OneNote. A document that is not inkable (e.g., pdf files) will not be graded.**

**Submission:**

Assignments must be submitted electronically via my.gcc. Be sure to upload your files correctly the first time. If you have any problems prior to the submission deadline, please contact the instructor.

Extensions will not be granted for technology-related issues. Leave yourself enough time to complete the assignment and submit the assignment via mygcc.