CSSE 132 – Introduction to Computer Systems
Rose-Hulman Institute of Technology
Computer Science and Software Engineering Department

Homework 1

Write your answers on a separate sheet of paper.

1. (20 points) Convert the following unsigned decimal numbers to their 16-bit unsigned binary and hexadecimal representations. You must show your work to earn full credit. You may use a calculator to confirm your answers.

   (a) 65533

   (b) 256

   (c) 255

   (d) 43690

2. (20 points) Convert the following unsigned 16-bit binary numbers to their decimal *and* hexadecimal representations. You must show your work to earn full credit. You may use a calculator to confirm your answers.

   (a) 0010 0111 1001 0000

   (b) 0001 1111 1111 1111

   (c) 1000 0000 0000 0000

   (d) 0000 0000 0000 0111

3. (20 points) convert the following unsigned 16-bit hexadecimal numbers to their decimal *and* binary representations. you must show your work to earn full credit. you may use a calculator to confirm your answers.

   (a) 0x12bd

   (b) 0x1ee7

   (c) $FFFF_{16}$

   (d) 0xec01

4. (20 points) Perform the following arithmetic operations on the given 8-bit unsigned numbers. Be sure to sure your work and note whether or not there is overflow.

   (a) 1111 0000 + 0011 1000

   (b) 0111 1100 + 0000 1111

   (c) 0000 0001 - 0000 0011

   (d) 0010 1110 - 0001 1111

5. (20 points) Perform the following arithmetic operations on the given 8-bit signed numbers (in two's complement form). Be sure to sure your work and note whether or not there is overflow.

   (a) 0111 0001 + 0000 1111

   (b) 1111 1110 + 0000 0111

   (c) 0000 0011 - 1111 1111

   (d) 1111 1101 - 0000 0101