CS 310   **Computer Organization and Programming**   **Spring 2008**

Professor Fussell   **Due: Jan. 24, 2008**

Assignment #1

Instructions: The assignment is due in your discussion section on the date shown above. Written assignments are to be handed directly to your TA, and may not be submitted electronically. Written assignments should be neat, with the pages stapled together (if we can't read your answer, credit will not be given). At the top of the first page, write your name, section number, and assignment number. Remember that collaboration on the assignments is not allowed and will be considered academic misconduct. If you have questions, e-mail them to your TA or ask in person.

1. Patt and Patel 1.10

2. Patt and Patel 1.12

3. Patt and Patel 1.22

4. VERY short answer... maybe one sentence...

    a. Is it possible to increase the accuracy of a value in a digital computer? (why?)

    b. Which offers more precision, a 32-bit integer or a 32-bit float?

    c. Briefly describe the difference between an ISA and a micro architecture.

    d. Why would the IEEE floating point standard choose a biased format for the signed exponent instead of 1s complement, 2s complement, or signed complement format?

5. Tedious Base Conversions (TBCs):

    a. Convert to Decimal: 10010_2, 10010_{16}, 123_8, 8192_{BCD}, $BEEF_{16}$

    b. Convert to binary: 365_{10}, $2DECAFED_{16}$

6. Now for something a little different...

    a. Convert the decimal number 7 into unary and trinary

    b. Express the decimal number 1.4 as binary fixed point (NOT floating) to 8 digits accuracy (be careful about rounding). What would it look like with infinite digits?

    c. Express the number 6 in base negative 2, that is, 6_{-2}. As optional amusement, write out the numbers from 0 to 15 in base negative 2.

    d. Do numbers have a unique representation in a negative base?

    e. Can any (reasonably sized) number be expressed in a negative base?

7. Useful Tidbits...

    a. What was the number contained in the message Jeff sent out to the class mailing list Tuesday (Jan. 15)?

    b. The class reader that augments the textbook for this class contains excerpts from how many different books?

    c. For which questions does Patt and Patel offer students freely available solutions?

8. Submit the completed student information survey form.