

CS520—Spring 2013—Homework 13
Wednesday May 1

Question 1

The IAS computer utilized *one-address* instructions. What does this mean? An arithmetic instruction, such as to do addition, operated on what operands?

Question 2

The IAS computer supported 40-bit fixed-point values. What value is represented by the following bits (shown in hexadecimal)?

0x7000000000

Show your answer in decimal.

Question 3

Represent the decimal value -0.375 as an IAS 40-bit fixed-point value. Show your answer in hexadecimal. Show all ten hex digits, even if they are zero.

Question 4

The CDC 6600 computer had a memory of 60-bit words and a 6-bit character set. To save memory, multiple characters were packed per word. Using the table for the 64-character character set provided at http://en.wikipedia.org/wiki/Display_code, represent the string "HELLO, WORLD" in a sequence of 60-bit words. Assume that the string is terminated by the character 0. Assume that the leading characters are first packed into the upper bits of a word, with following characters being placed into the lower bits. The terminating character 0 is placed into the last word. Set any unused bits in the last word to 0. Show your answer in hexadecimal, showing all hex digits of each word, even if they are 0.

Question 5

Both the IAS and the CDC 6600 routinely used self-modifying code. Explain.