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CSC365-01

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Assignment 2

1) Practice with integer arithmetic: (use 10 bit word size)

1. For the following, what is the result (show the binary representation

and the decimal result and state when there was overflow or

underflow and assume 2’s complement for everything)

1. What is the largest positive number possible?

511

ii) What is the most negative number possible?

-512

iii) 25610 + 30010 =

01000000002

+ 01001011002

10001011002 = -46810 OVERFLOW

iv) 7510 + 10010 =

00010010112

+ 00011001002

00101011112 = 17510

v) -25610 + 25510 =

11000000002

+ 00111111112

11111111112 = -110

vi) -40010 – 20010 = -40010 + -20010

10011100002

+ 11001110002

01101010002 = 44210 OVERFLOW

vii) 7510 \* -510 =

00010010112

\* 00000001012

00010010112

+ 01001011002

01011101112

10100010012 = -37510

2) Practice with IEEE Floating Point representation:

a) What is the general equation for binary floating point representation?

b) For a 10 bit number with 4 bit exponent and a 5 bit fractional part (1

sign bit) derive the following (for each item below show the bit

representation, the bit fields for exponent and fraction, the work of

plugging these into the equation from a) and the final decimal value if

appropriate).

i) What is the representation for ‘0’?

ii) What is the representation for ‘1’?

iii) What is the representation for infinity?

iv) What is the smallest positive De-normalized value that is not zero?

v) What is the largest positive De-normalized value that is not zero?

vi) What is the smallest positive Normalized value?

vii) What is the largest positive Normalized value?