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| Student Name: Matthew Lin ......................................................................................................... | Spring 2018  In Class Assignment 12 |
| Student Number: B01211593  ..................................................................................................... | March 26, 2018 |

Place the answers in this file and submit via Blackboard. Follow the instructions in Lecture 15 slides.

1. Convert the number (101.11)2 to (????)10. Follow the instructions in Lecture 15 slides. Show your work.

1x2^2 0x2^1 1x2^0 . 1x2^-1 1x2^-2

4 0 1 . 0.5 0.25

5.75

1. The decimal value 7.46875 written in base two positional notation is 00111.01111. What is the mantissa of this number according to IEEE 754? (Follow the instructions in Lecture 15 slides) Show your work.

111.01111

1.1101111 x 2^2

1101111 x 2^2

11011110000000000000000

1. Convert the actual exponent to a biased exponent, then write the binary exponent as an 8 bit binary. ***Show your work for binary conversion.***

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| Actual exponent | Biased exponent (decimal) | Biased exponent in 8 bit binary |
| 0 | 127 | 12710 = (0111 1111)2 |
| 1 | 128 | 12810 = (1000 0000)2 |
| 10 | 137 | 13710 = (1000 1001)2 |
| -10 | 117 | 11710 = (0111 0101)2 |
| -127 | 0 | 010 = (0000 0000)2 |
| -126 | 1 | 110 = (0000 0001)2 |

128/2 = 63 0 137/2 = 68 1 117/2 = 58 1 12710 is on the slides

64/2 = 32 0 68/2 = 34 0 58/2 = 29 0

32/2 = 16 0 34/2 = 17 0 29/2 = 14 1

16/2 = 8 0 17/2 = 8 1 14/2 = 7 0

8/2 = 4 0 8/2 = 4 0 7/2 = 3 1

4/2 = 2 0 4/2 = 2 0 3/2 = 1 1

2/2 = 1 0 2/2 = 1 0 1/2 = 0 1

1/2 = 1 1 1/2= 0 1