Rushma Basnet thapa

Quiz

1a) 5.75

Binary: 101.110

2	5
2	2 | 1
	1 | 0

.75	
1	50
1	0

b) 63/64 = 0.984

Multiply by x2

0.984 x 2 = 1.968
0.968 x 2 = 1.936
0.936 x 2 = 1.872
0.872 x 2 = 1.774.

0.774 x 2 = 1.488
0.488 x 2 = 0.976
0.976 x 2 = 1.952
0.952 x 2 = 1.904

0.904 x 2 = 1.808
0.808 x 2 = 1.615

= 0.111110111

c) 9.8125

1001.1101

2	9	
2	4	1
2	2	0
	1	0

.8125	
1	6250
1	250
0	50
1	0

(2) 34.890625

100010.111001

1.00010111001 x 2^5

Ex = 5 + 127 = 132

S → +ve

10000100

M = 10000100

2	34	
2	17	0
2	8	1
2	4	0
2	2	0
	1	0

.890625	
1	781250
1	56250
1	1250
0	250
0	50
1	0

2	132	
2	66	0
2	33	0
2	16	1
2	8	0
2	4	0
2	2	0
	1	0

+	8 bit	23 bit
0	10000100	00010111001000...
S	Exponent	mantisa

(3)

1 bit	8 bits		
0	0 1 1 1 1 0 1 1	0 0 0 0 0	0 0
sign	Exponent		

→ To convert binary to decimal value we use the step where we see sign 0 is positive and if there was 1 the sign would be negative, we move the decimal value to left until we get last single bit the number will represent the exponent. Then we have to add to the bias for ex (any exp + 127) and we convert it to decimal the rest will be mantissa.

4) Floating point representation

S	E'	M

where S = sign

E' = Biased exponent ($E' = E + Bias$)

M = Mantissa (Normalization)

A floating point number is denormalized if the exponent field contains all 0's & fraction field doesn't have 0 In that case we just assume exponent to be the smallest value & don't assume 1 at mantissa

Smallest mantissa = 1.0000

0	0000	1111

7 Smallest positive normalize number & largest positive denormalized number that represent IEEE 754 Single precision floating.

Smallest representative positive number

$2^{-7} = \frac{1}{128}$

Mere bit patton (00000000)

largest representative It is negative number

$-2^{-7} = -\frac{1}{128}$

(10000000)

$2^7\ 2^6\ 2^5\ 2^4\ 2^3\ 2^2\ 2^1\ 2^0$

128 64 32 16 8 4 2 1