Computer Architecture

Tutorial 4 – Floating Point Numbers

1) Convert the following decimal numbers to binary: a) 5.5 b) 8.25 c) 9.3 d) 11.46875

2) Convert the binary number 1001.1010101 to decimal.

3) Normalise the following binary numbers: a) 101.1 b) 1000.01 c) 0.00010101

4) Convert –31.3 to IEEE Single Precision format.

5) Interpret the 32-bit hexadecimal value C154 0000 as an IEEE Single Precision number.

6) Carry out the operation 31.3 + 13.25 in IEEE Single Precision arithmetic

7) Fill in the missing entries

Fraction	Binary	Decimal
1/4	0.01	0.25
3/8		
23/16		
	10.11101	
	1.011	
		5.625
		3.0625

8) Consider a five-bit floating representation based on the IEEE floating point format with 1 sign bit, two exponent bits and 2 significand bits. For this format fill in the missing entries:

Bits	Binary Value or Special Value	Decimal value or Special Value
0 00 00		
0 00 01		
0 00 10		
0 00 11		
0 01 00		
0 01 01		
0 01 10		
0 01 11		
0 10 00		
0 10 01		
0 10 10		
0 10 11		
0 11 00		
0 11 01		
0 11 10		
0 11 11		