

$$01101 \div 101$$

$$\begin{array}{r}
 00010 \\
 101 \overline{) 01101} \\
 \underline{0110} \\
 -101 \\
 \hline
 11
 \end{array}$$

DMSB

$$= 10 \text{ rem } 11$$

$$\begin{array}{r}
 00010 \quad | \quad 1001 \\
 101 \overline{) 01101} \quad | \quad 0000 \\
 \underline{0110} \quad | \quad \\
 -101 \quad | \quad 0 \\
 \hline
 -10 \quad | \quad 1 \\
 \hline
 - \quad | \quad 1000 \\
 \quad \quad | \quad 101 \\
 \quad \quad | \quad 11
 \end{array}$$

$$= 00010.1001 \text{ (approx)}$$

$Q_4 = 4$

Floating Point Numbers

$$y = M \times b^E$$

$$M \equiv Q_{0.m} \\ \in \mathbb{R}$$

$$E \equiv Q_n \\ \in \mathbb{Z}$$

M of $Q_{0.3}$ E of Q_4

$$\begin{aligned} 8_{10} &= 01000 \text{ } Q_4 \\ &= 00100.0 \times 010 \\ &= 00010.00 \times 0100 \\ &= 00001.000 \times 01000 \\ &= 00000.10000 \times 010000 \\ &= 0.100 \times 010000 \\ &= 0.100 \times 2^{0100} \\ &= 0.100 \text{ } e00100 \end{aligned}$$

$$\begin{aligned} -8_{10} &= -1 \times (01000) \\ &= 11000 \\ &= 11100.0 \times 010 \\ &= 11110.00 \times 0100 \\ &= 11111.000 \times 01000 \\ &= 1.000 \text{ } e00011 \end{aligned}$$

$$\begin{array}{r} 01000 \\ - 10111 \\ + \quad \quad 1 \\ \hline 11000 \end{array}$$

$$0.101101 \text{ } e00110$$

$$0.703125 \times 2^6 = 45_{10}$$

$$= 01.01101 \text{ } e00101$$

$$= 010.1101 \text{ } e00100$$

$$= 0101.101 \text{ } e00011$$

$$= 0101.01 \text{ } e00010$$

$$= 010110.1 \text{ } e00001$$

$$= 0101101 \text{ } e00000$$

$$0.101e000 + 0.011e010$$

$$= 0.101e000 + 0.110e001$$

$$= 0.010e001 + 0.110e001$$

$$\begin{array}{r} 0010 \\ + 0110 \\ \hline 01.000 \end{array} \text{formatted} = 0.100e001$$

$$0.100e(001+001)$$

$$= 0.100e010$$

$$0.0010e00100 + 1.11101e000001$$

Normalised when $MSB = \overline{MSB}$

$$0.1000e00010 + 1.01000e1110$$

$$1.11e000$$

$$1.10e111$$

$$1.00e110$$

$$0.1000e00010 + 1.11101e00010$$

→ changing format to 204 $|||||/|||/|||/|||/|||/|||$

$$\begin{array}{r} 01000 \\ + 11111 \\ \hline 100111 \end{array} \equiv 10.0111$$

$$= 1.0011e00001$$

$$= 1.0011e(00010 + 00001)$$

$$= 1.0011e00011$$