

$$Q = \frac{R}{2^B} \quad m = b_1 2^{-1} + b_2 2^{-2} + \dots$$

$$x_q = Qm \quad [0, 2^B]$$

offset is added for the sign bit/negative numbers

8-bit ulaw coded signal

2^8 unique values

table lookup

$$\begin{bmatrix} 00000000 \\ 00000001 \\ \vdots \\ \vdots \\ \vdots \end{bmatrix} \Rightarrow \begin{bmatrix} 3.125 \\ 4.369 \\ -1.715 \\ \vdots \\ \vdots \end{bmatrix}$$

code

short int a[256]

read 8-bit number as unsigned byte \Rightarrow val

a[val]

short int x[];

8 bit = convert(x[i])

$$\text{val} = x[3] + x[7]$$

$$\text{val} = \text{table}[x[3]] + \text{table}[x[7]]$$

x

→ a[x]

cat x.dat | cat > y.dat

