

# CpSc 1010 Binary Conversion

Base 10  $\rightarrow$  Base 2  
 decimal  $\rightarrow$  Binary

173

$$\begin{array}{r} 86r1 \\ 2 \overline{)173} \\ \underline{16} \\ 13 \end{array}$$

$$\begin{array}{r} 43r0 \\ 2 \overline{)86} \end{array}$$

$$\begin{array}{r} 21r1 \\ 2 \overline{)43} \end{array}$$

$$\begin{array}{r} 10r1 \\ 2 \overline{)21} \end{array}$$

$$\begin{array}{r} 5r0 \\ 2 \overline{)10} \end{array}$$

$$\begin{array}{r} 2r1 \\ 2 \overline{)5} \end{array}$$

$$\begin{array}{r} 1r0 \\ 2 \overline{)2} \end{array}$$

Binary

10101101

5 4 3 2 1 0

.... 173 = 100 + 70 + 3

$$100 = 1 \times 10^2$$

$$70 = 7 \times 10^1$$

$$3 = 3 \times 10^0$$

7 6 5 4 3 2 1 0

10101101

- $1 \times 2^0 = 1 \times 1 = 1$
- $\rightarrow 0 \times 2^1 = 0 \times 2 = 0 \leftarrow$
- $1 \times 2^2 = 1 \times 4 = 4$
- $1 \times 2^3 = 1 \times 8 = 8$
- $\rightarrow 0 \times 2^4 = 0 \times 16 = 0 \leftarrow$
- $1 \times 2^5 = 1 \times 32 = 32$
- $\rightarrow 0 \times 2^6 = 0 \times 64 = 0 \leftarrow$
- $1 \times 2^7 = 1 \times 128 = 128$

$$\begin{array}{r} 1 \\ 4 \\ 8 \\ 16 \\ + 128 \\ \hline 173 \end{array}$$

Email