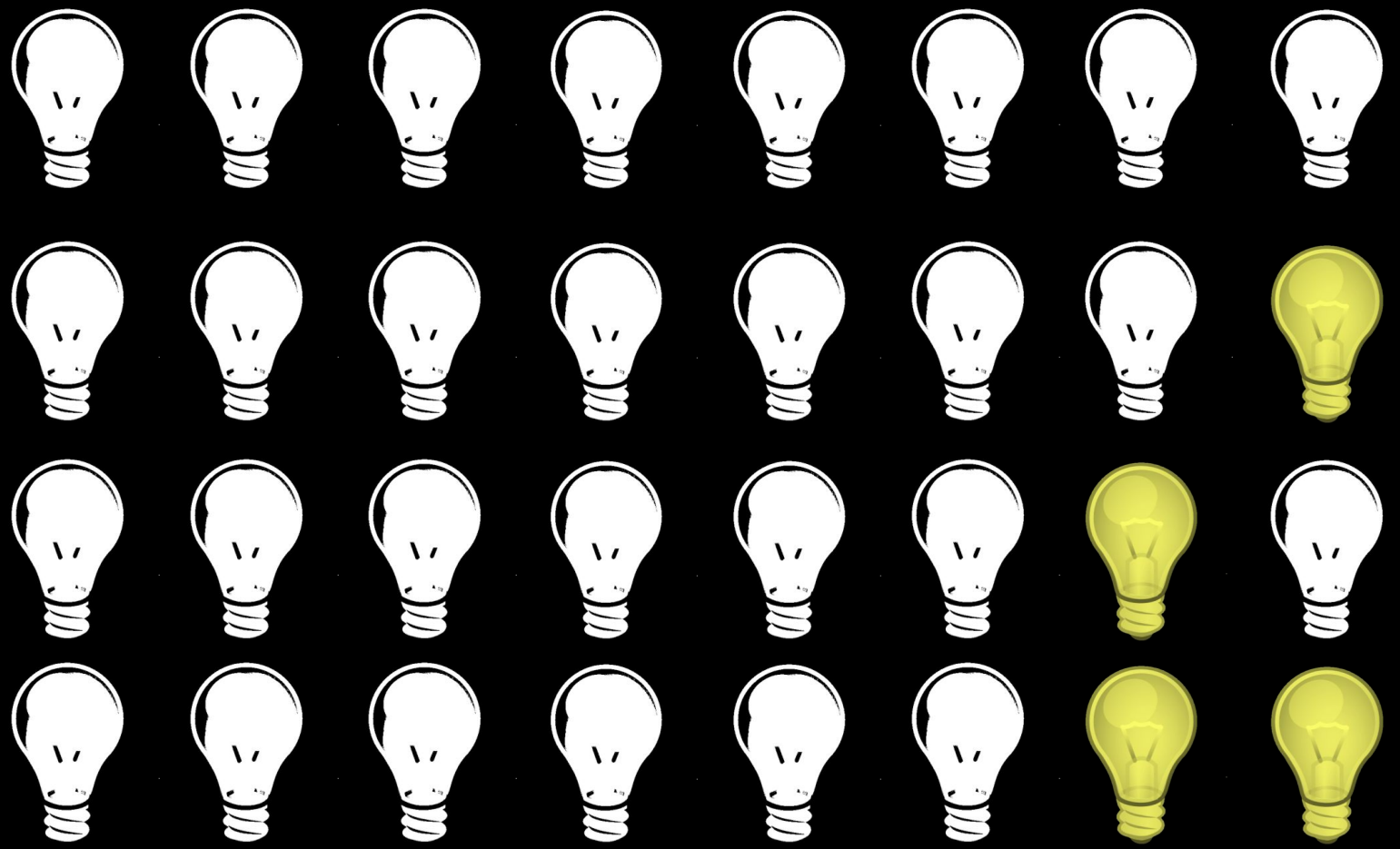

We are used to decimal notation:

$$\underset{10^2}{1}\ \underset{10^1}{6}\ \underset{10^0}{3}$$

$$1*10^2 + 6*10^1 + 3*10^0 = 163$$

Computers store and process data via binary notation:

$$\underset{2^7}{1}\ \underset{2^6}{0}\ \underset{2^5}{1}\ \underset{2^4}{0}\ \underset{2^3}{0}\ \underset{2^2}{0}\ \underset{2^1}{1}\ \underset{2^0}{1}$$

$$1*2^7 + 0*2^6 + 1*2^5 + 0*2^4 + 0*2^3 + 0*2^2 + 1*2^1 + 1*2^0 = 163$$

Converting Binary to Decimal (and vice versa)

$1 = 1*2^0 = 1$

$10 = 1*2^1 + 0*2^0 = 2$

$11 = 1*2^1 + 1*2^0 = 3$

$100 = 1*2^2 + 0*2^1 + 0*2^0 = 4$

$101 = 1*2^2 + 0*2^1 + 1*2^0 = 5$

Addition and Subtraction (Don't forget to carry your 1s)

$$\begin{array}{r} 1\,0\,1\,0^{1}\,1^{1}\,1 \\ +\;0\,1\,0\,0\,0\,1 \\ \hline 1\,1\,1\,1\,0\,0 \end{array}$$

$$\begin{array}{r} 1\,1\,\cancel{1^{0}}\,\cancel{0^{10}}\,0 \\ -\;0\,0\,0\,1\,0 \\ \hline 1\,1\,0\,1\,0 \end{array}$$