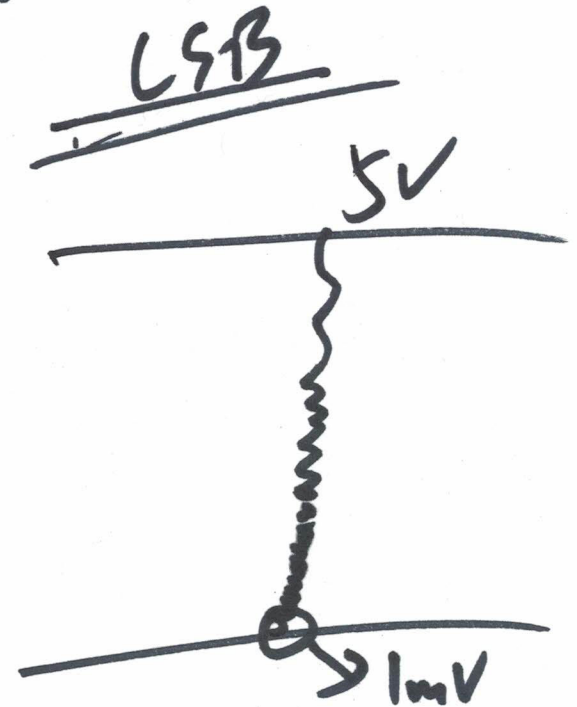


Example: Find the resolution for a DAC if the output voltage is desired to change in 1mV increments while using a reference voltage of 5V.

$$\frac{1\text{mV}}{5\text{V}} = \frac{1\text{LSB}}{2^N}$$
$$= 0.002$$

$$N = \log_2 \frac{1}{0.002} = 12.29 \text{ bits}$$

A 13-bit DAC will be needed



Example: Find the number of input combinations, values for 1 LSB, and full-scale voltage generated for a 3-bit, 8-bit, and 16-bit DAC.

DAC.  $V_{REF} = 5V$

$$\frac{2^N - 1}{2^N} \cdot V_{REF}$$

Resolution	<del>Input</del> Input Combination	1 LSB	<u><u><math>V_{FS}</math></u></u>
3	$2^3 = 8$	$\frac{5}{8} = 0.625V$	4.375V
<u>8</u>	$2^8 = 256$	$\frac{5}{256} = 19.5\mu V$	4.985V
16	$2^{16} = 65536$	$\frac{5}{65536} = 76.2\mu V$	4.999V

(2)