2-34. A wireless garage door opener has a code determined by the up or down setting of 12 switches. How many outcomes are in the sample space of possible codes?

For us EECS-types, this seems straightforward:

$$2^{12}$$

However it is helpful to re-cast our answer in terms of EECS 461

Each switch has 2 positions, we must choose 1 for each switch:

$$\underbrace{\binom{2}{1}\binom{2}{1}\cdots\binom{2}{1}}_{12\ times} = 2^{12} \boxed{= 4096}$$

2-35. An order for a personal digital assistant can specify any one of five memory sizes, any one of three types of displays, any one of four sizes of a hard disk, and can either include or not include a pen tablet. How many different systems can be ordered?

Based on the previous example, our answer is

$$\binom{5}{1}\binom{3}{1}\binom{4}{1}\binom{2}{1} \boxed{= 120}$$