

Answer on Question #49216 – Math – Combinatorics | Number Theory

A street sign can be ordered with the following options:

Sheeting: Option A or Option B

Power Type: Option A or Option B

Timer: Option A, Option B or Option C

Push Button: Option A, Option B or Option C

Channel: Option A, Option B or Option C

Sensor: Option A, Option B or Option C

How many total configurations are there?

Solution

A street sign can be ordered with the following options:

Sheeting: Option A or Option B – 2 states

Power Type: Option A or Option B – 2 states

Timer: Option A, Option B or Option C – 3 states

Push Button: Option A, Option B or Option C – 3 states

Channel: Option A, Option B or Option C – 3 states

Sensor: Option A, Option B or Option C – 3 states

Consider options within arbitrary category are independent of options from other categories. Hence, by multiplication rule, total number of configurations is just a product of numbers of distinct categories' states.

$$2 * 2 * 3 * 3 * 3 * 3 = 2^2 * 3^4 = 4 * 81 = 324$$

Answer: 324