

Assign a number per colour.

Each person will apply a function of what it see and call the associated colour.

Functions for the 2 first people in the first row are:

$$A0(b_0, b_1) = (b_0 + b_1) \% 3$$

$$A1(b_0, b_1) = (2b_0 + b_1) \% 3$$

Functions for the 2 first people in the second row are:

$$B0(a_0, a_1) = (2a_0 + a_1) \% 3$$

$$B1(a_0, a_1) = (2a_0 + 2a_1) \% 3$$

The fifth person can say whatever he/she wants : Orange.

Ex:

Red=0, Green=1, Blue=2

Row A = Red, Green, Red $\Rightarrow 0, 1, 0$

Row B = Red, Blue $\Rightarrow 0, 2$

$$A0(b_0, b_1) = A0(0, 2) = (0 + 2) \% 3 = 2 \quad \Rightarrow \text{Blue - wrong}$$

$$A1(b_0, b_1) = A1(0, 2) = (2 \cdot 0 + 2) \% 3 = 2 \quad \Rightarrow \text{Blue - wrong}$$

$$B0(a_0, a_1) = B0(0, 1) = (2 \cdot 0 + 1) \% 3 = 1 \quad \Rightarrow \text{Green - wrong}$$

$$B1(a_0, a_1) = B1(0, 1) = (2 \cdot 0 + 2 \cdot 1) \% 3 = 2 \quad \Rightarrow \text{Blue - right}$$