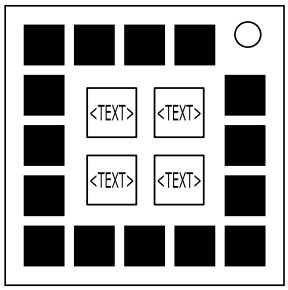
On the Subject of Ultra Digital Root



Did we really need to go this far?

This module has 4 colored buttons with colored text on them. It also has 15 displays that are either showing a number or a letter.

To solve this module, one of the buttons must be held at a certain time and then released at a certain time. To get the correct button and the times it needs to be held and released at, follow the step-by-step process below.

If the button is held or released at the wrong time or the wrong button is used then a strike will be recorded on button release and the module will reset.

Step 1

Take the sum of every number on the displays (in yellow). Then take all the letters on the displays (in green) that are NOT in the serial number and convert them to their alphabetical positions (A=1...Z=26). Add both of these numbers together and if their multiplicative digital root is not zero then use the multiplicative digital root in the table below to get a column of edgework. Otherwise, use the additive digital root.

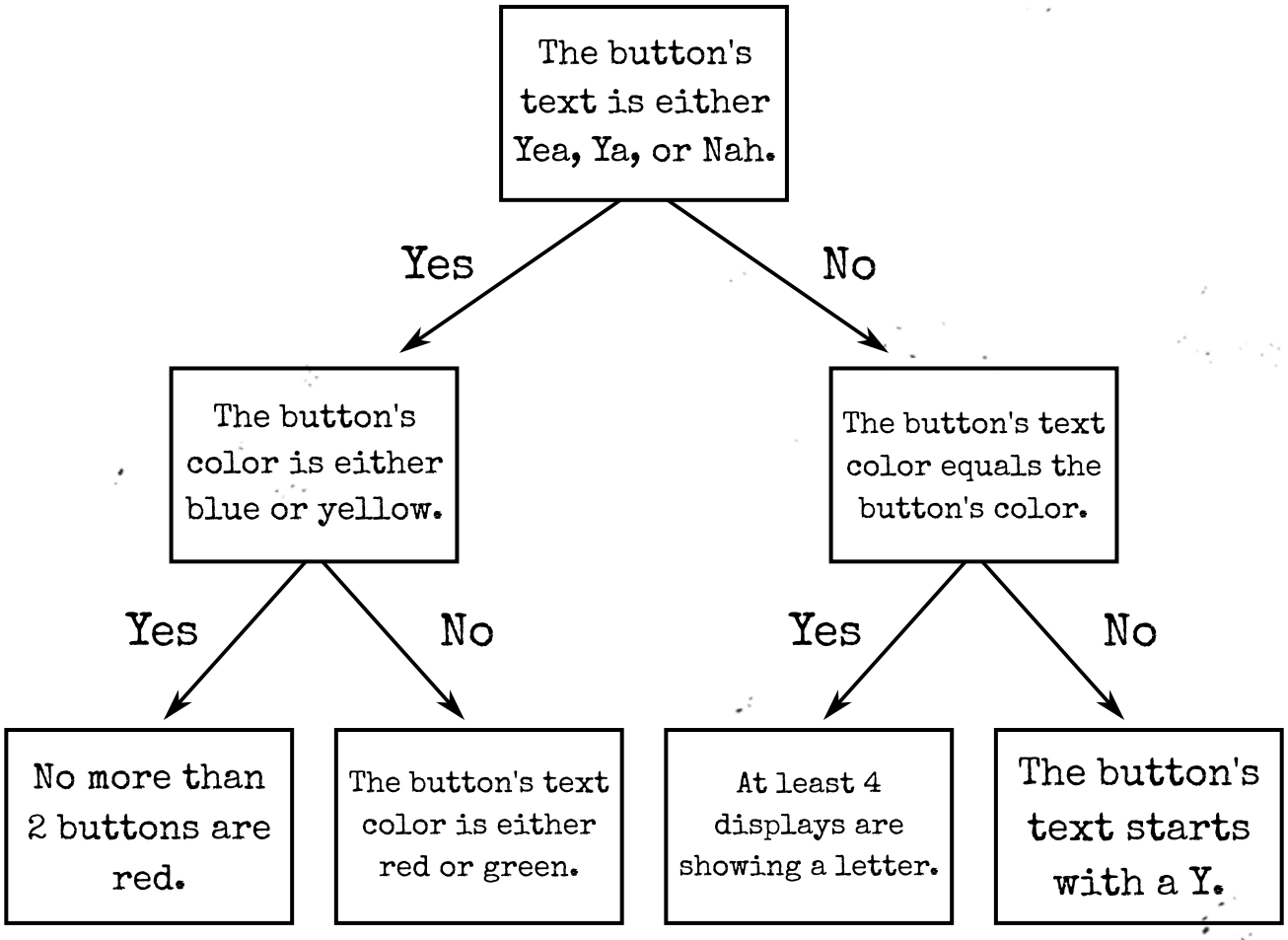
1	2	3	4	5
SND	Even serial number digit	USB	Serial number vowel	Component Video
Serial	CAR	Odd battery holders	Time of Day	NSA
Two Factor	Even batteries	TRN	MSA	FRK
PS/2	Composite Video	Odd batteries	AA Battery	Numbered indicator

6	7	8	9
Serial number consonant	HDMI	PCMCIA	FRQ
SIG	Even battery holders	CLR	D Battery
Stereo RCA	IND	DVI-D	Encrypted indicator
VGA	Odd serial number digit	Date of Manufacture	Parallel

Go through each piece of edgework that was received and determine if it is present on the bomb or not. If the piece of edgework is present on the bomb assign it the number 1, otherwise assign it 0. Going from top to bottom in the column using these numbers will result in a 4-digit binary number.

Step 2

Go through the flowchart below for each button on the module. For each position at the bottom row of the flowchart, if it had an even number of times it was reached and true assign it a 1, otherwise assign it 0. Going from left to right in the bottom row of the flowchart using these numbers will result in a 4-digit binary number. This number will have 1 different digit than the previous binary number. The position that is different in the binary numbers is the position in reading order of the correct button.



Step 3

Sum the number received from step 1 before the digital root was taken and the two binary numbers converted to decimal. The button must be held when the total number of seconds remaining contains the additive digital root of the sum plus the additive persistence of the sum.

The button must then be released when the total number of seconds remaining contains the multiplicative digital root of the sum plus the multiplicative persitence of the sum.

Operation Notes

- Additive Digital Root - Keep adding a number's digits together until they are a single number.
- Multiplicative Digital Root - Keep multiplying a number's digits together until they are a single number.
- Additive Persistence - The number of times the addition had to be done to make the number a single digit when getting an additive digital root.
- Multiplicative Persistence - The number of times the multiplication had to be done to make the number a single digit when getting an multiplicative digital root.
- Binary To Decimal - Each binary digit represents a power of 2, starting from 3 on the left and ending with 0 and the right. Add the powers that have a 1 in their position together to get the corresponding decimal number.