Solution to Painter's Sudokus

(Puzzle by Yannick Yao)

Answer: CENTESIMO

As hinted by the title, this is indeed a colorful puzzle. But wait a minute: this puzzle grid is already completed! Or is it? We can quickly see that a lot of things are wrong here. First, there are several 1s in the bottom 3 by 3 box, and several 7s in the bottom-left 3 by 3 box, and neither of these are supposed to happen to an actual Sudoku grid. Second, there are many numbers that are in the range between 10 and 18 inclusive. It seems like there is more to this Sudoku puzzle.

And indeed! This is in fact not one Sudoku puzzle, but THREE Sudoku puzzles superimposed with each other! (Otherwise why would I make the title plural?) The three words above the title (that vaguely make sense as a phrase) tell us that the three basic colors are red, green and blue, and the yellow, cyan and magenta numbers, while each being an addition of two basic colors (according to RGB values), are also additions of the numbers of the basic grids. (For example, the yellow 18 on the first row of the grid means that the numbers in the "red" and "green" grids in the corresponding places should add up to 18 – yellow = red + green – which means that both numbers are 9.)

Combined with the "basic" information (the numbers in one of the three basic colors), we can now try to solve the three Sudoku grids simultaneously. The common technique here is to list all the candidate numbers in the composite-colored cells, and eliminate possibilities using the sum condition. As it turns out, the sum conditions are pretty strong, which makes the solutions to all three grids unique, as shown below: (the colored numbers are parts of the "givens", and the uncolored ones are based on logical deduction)

The final step is to use the background colors on the diagonal to determine the number needed to index into the corresponding word to extract the final answer, which is CENTISIMO.

CENTESIMO — 9 7 7 2 4 1 7 3 2

5	11	8	18	4	8	1	2	6
10	8	1	4	5	7	9	2	7
6	4	2	1	7	1	8	13	6
17	6	4	6	8	5	3	4	7
2	9	13	6	3	3	4	6	13
3	6	6	1	5	8	9	3	8
3	7	7	2	16	4	6	9	1
15	5	7	8	1	4	2	5	11
5	4	8	1	1	9	11	9	9

SOMETHING — 2 4 7

4	3	5	9	7	8	1	2	6
9	8	1	4	2	6	5	7	3
6	2	7	5	3	1	9	4	8
2	5	4	8	1	9	3	6	7
1	7	8	6	4	3	2	9	5
3	9	6	7	5	2	4	8	1
8	6	3	2	9	5	7	1	4
7	1	2	3	8	4	6	5	9
5	4	9	1	6	7	8	3	2

STRANGELY — 1 2 ... 7

5	8	3	9	4	6	1	2	7
1	7	9	3	2	8	5	6	4
6	4	2	1	7	5	8	9	3
9	6	4	2	8	3	7	1	5
3	1	5	6	9	7	2	4	8
7	2	8	4	5	1	9	3	6
2	9	7	8	3	4	6	5	1
8	3	1	5	6	9	4	7	2
4	5	6	7	1	2	3	8	9

SYMPHONIC — 3 ... 7 9

9	3	4	2	8	6	1	5	7
6	8	1	9	5	7	4	2	3
5	2	7	3	4	1	8	9	6
8	7	3	6	2	5	9	4	1
1	9	2	7	3	4	5	6	8
4	6	5	1	9	8	3	7	2
3	1	9	4	7	2	6	8	5
7	5	6	8	1	9	2	3	4
2	4	8	5	6	3	7	1	9

Side notes:

The word "Painter" in the title might not have been the most accurate word, since it leads some teams into thinking that the coloring system should be CMYK, which is used for printers, instead of RGB, which is used for computer monitors and image storage. However, I would hope that the fact that the words are in RGB and none of the RGB colors are greater than 9 should soon convince the teams otherwise.

Also a general warning to the teams who relied on online solving websites: most of these websites work well with Sudoku grids with unique solutions, but will likely fail to remind the user that the answer is not unique in other situations like this one (when only using RGB numbers to solve the grids). I personally recommend more professional software like Hodoku when solving puzzles with possibly non-unique solutions.