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# PROBLEM OF THE WEEK

11/25/14 due NOON 12/8/14

CAN YOU GIVE US A SOLUTION?

## Problem No. 13 (Fall 2014 Series)

Form a “triangle” with 10 blocks in its top row, 9 blocks in the next row, etc., until the bottom row has one block. Each row is centered below the row above it. Color the blocks in the top row red, white and blue in any way. Use these two rules to color the remaining rows of the triangle:

- If two consecutive blocks in a row have the same color, the block between them in the row below has the same color.
- If two consecutive blocks in a row have different colors, the block between them in the row below has the third color.

Tell how you can always predict the color of the bottom block after seeing only the top row (and not constructing the intermediate rows). Prove your answer.

A panel in the Mathematics Department publishes a challenging problem once a week and invites college & pre-college students, faculty, and staff to submit solutions. The objective of this is to stimulate and cultivate interest in good mathematics, especially among younger students. Solutions are due within two weeks from the date of publication.

Solutions can be emailed only as a pdf attachment to: [sfchang@purdue.edu](mailto:sfchang@purdue.edu). Solutions can also be faxed to 765-496-3177 or sent by campus or U.S. mail to:

PROBLEM OF THE WEEK, **6th Floor**, Math Sciences Bldg., Purdue Univ.,  
150 North University St., West Lafayette, IN 47907-2067

Please include your name, address and **status at your university or school** on your problem solutions.

The names of those who submitted correct solutions will be posted on the Problem of the Week website and in the Math. Library, along with the best solution. Every Purdue student who submits three or more correct solutions will receive a Certificate of Merit. A prize fund of \$300.00 will be distributed among those Purdue undergraduates who have contributed at least six correct solutions for the thirteen problems in the Fall 2014 series.