Consider a rectangular array of distinct real numbers with the property that each row is ordered from smallest to largest (from left to right). Now reorder each column individually so that they are ordered from smallest to largest (from top to bottom). Prove that the rows are still ordered from smallest to largest.

Please submit your solution to:

- Dr. Christian Avart, cavart@gsu.edu

before the deadline: May 1st, 7:00pm. The WINNER will be awarded with a $15 gift card, a certificate, and will be announced in the NEXT issue.

Solution to the March 2017 Problem of the Month

Let S be any fixed switch acting on a bulb B (among others). Now consider all the possible combinations of positions of the other switches. For each such configuration, bulb B is either on or off. If it is on, switching S will turn it off, and if it is off, switching S will turn it on. This means that each combination of switches turning B off can be paired with a combination of switches turning it on. Consequently, over all possible switch combinations, B is on exactly half the time. Since we made no assumption on B, this is true of any bulb and thus, over all possible combinations of switches, the average number of switches on is exactly 50. Since initially all the bulbs are off, for the average number of bulbs turned on to be 50, there must be a configuration of switches yielding more than 50 bulbs on to compensate.

Winner: Arun Bharadwaj Suresh.

Other correct submissions: Ruoyi Chen.
