Consider the set X of positive integer which, in base 10, do not contain any 0. Prove that the series

$$\sum_{x \in X} \frac{1}{x}$$

converges.

Please submit your solution to:

- Dr. Tirtha Timsina, ttimsina@gsu.edu
- Dr. Christian Avart, cavart@gsu.edu

before the deadline: November 28th, 7:00PM. The WINNER will be awarded with a $ 15 gift certificate and will be announced in the NEXT issue.

Solution to the October Problem of the Month:

Since the initial state of all the bulbs is off, any bulb will be **on** if it is switched *odd* number of times and **off** if it is switched *even* number of times. Any light bulb number **K** will be switched only by the student whose number is a factor of **K**. For example bulb number 10 will be switched by student number 1, 2, 5 and 10. Since there are four factors it will be off. Bulb number 16 will be switched by 1, 2, 4, 8, 16. Since there are five factors, it will be on.
All perfect squares 1, 4, 9, 16, ..., 81, 100 have odd number of factors. So these bulbs will still be illuminated after the 100th student passes through the room.

Winner: Ruoyi R. Chen