Proposed by Bernardo Ábrego and Silvia Fernández.   **October 4-11**

Consider a lamp fixture with 1000 lights in a row, and 1000 CSUN students. Each light can either be on or off, and it has a button that when pressed switches the status of the light (from 'on' to 'off' or from 'off' to 'on').

   At the beginning all lights are off, then the 1000 students proceed to change the lights in the following way: Student 1 pushes every button, Student 2 pushes every other button starting at 2, that is buttons 2,4,6,8,etc. Student 3 pushes every third button starting at 3, that is buttons 3,6,9,etc. The rest of the students follow the same pattern. For example, Student 100 pushes buttons 100,200,300, etc. The process ends with Student 1000 who simply pushes button 1000.

   How many lights are turned on in the end? Justify your answer.

Deadline: October 11, 2004 before 9:00 PM.
Look for the "Problem of the Week" every Monday in the Daily Sundial (Daily Spotlight section) or in our web site **www.csun.edu/math/probweek**

<u>Rules</u>:

1. Open to all enrolled undergraduate and graduate CSUN students.
2. The first complete and correct solution will be awarded a diploma and the choice of a magnetic building set or a five dollar prize.
3. The winner solution and the names of the authors of all correct solutions will be published in our web site (**www.csun.edu/math/probweek**). All authors whose solutions are complete and correct will receive certificates.
4. All solutions must be typed and sent electronically. PDF, Latex, or Word files are preferred.
5. All steps of the solution must be clearly justified.
6. Email your solution with subject "Problem of the week" to

   Bernardo.Abrego@csun.edu

7. Late solutions will not be considered.
8. For any questions contact the organizers

   Bernardo.Abrego@csun.edu, Silvia.Fernandez@csun.edu

   If you like puzzles and challenging problems ... join the Mathematics Department Problem Solving Workshop. We meet every Friday at 2:00 PM in FOB room 108. For more information visit our web site: www.csun.edu/math/workshop.