

Here is the famous locker problem: Imagine you are at a school that has 100 lockers, all shut.

- Suppose the first student goes along the row and opens every locker.
- 2. The second student then goes along and shuts every other locker beginning with locker number 2.
- 3. The third student *changes the state* of every third locker beginning with locker number 3. (If the locker is open the student shuts it, and if the locker is closed the student opens it.)
- 4. The fourth student *changes the state* of every fourth locker beginning with number 4.

Imagine that this continues until the 100 students have followed the pattern with the 100 lockers. At the end, which lockers will be open and which will be closed? Which lockers have been switched the most often? How many lockers, and which ones, were touched exactly five times?