**There are n people entering and exiting a gym. For each person i, where i {1,...,n}, the person enters at time ai and exits at ∈ time bi (assume that bi> ai for all i), and all the ai ,bi are distinct. At the beginning of the day, the lights in the room are switched off, and the first person who enters the room switches them on. In order to conserve electricity, if person i leaves the gym at time bi and there is no one else present in the gym at time bi, then person i will switch the lights off. The next person to enter will then switch them on again. Given the values (a1, b1), (a2 ,b2),...(an, bn), we want to find the number of times the lights get switched on. Design an efficient algorithm, and prove the correctness and running time of each algorithm**

**Solution**

* Int[] entryTime and int[] exitTime arrays represent the entry and exit times of people.
* n is the number of people (length of the input arrays).
* times and events arrays are used to combine and track entry and exit times and events, respectively.
* The code combines entry and exit times into a single array time and uses the events array to track whether each time is an entry (0) or exit (1) event.
* The code sorts the times array and applies the same permutation to the events array. This ensures that entry and exit times are in chronological order and paired with the correct event.
* The code initializes variables lightON and totalperson to keep track of the number of times the lights are switched on and the number of people currently in the gym, respectively.
* The code iterates through the sorted events. When it encounters an entry event (0), it increments the totalperson count. When it encounters an exit event (1), it checks if there's only one person in the gym. If so, it increments the lightON count and then decrements the totalperson count
* The code returns the final value of lightON , which represents the number of times the lights are switched on.
* This code efficiently solves the problem of counting the number of times the lights are switched on based on the given entry and exit times.