# Description of Problem

Optimizing lighting conditions is crucial for energy efficiency, with excessive lighting and the habit of leaving lights on causing unnecessary waste.

To ensure visual comfort during work, it is important to address the issue of fixed brightness in some desk lamps, which can lead to eye discomfort due to environmental changes. For nighttime safety, the automatic activation of night lights is necessary to prevent accidents when moving in the dark.

To mitigate the negative impact of prolonged sitting on physical health, reminders are needed to encourage breaks and posture adjustments. Time management is another aspect that needs attention, as individuals often forget to pay attention to their computer usage or reading time.

Finally, an integrated system displaying indoor temperature and humidity levels can provide valuable insights and suggestions for optimizing comfort and energy efficiency.

# Description of Proposed Solution

We propose a lamp-based home smart hub system to address the issues. The proposed system will incorporate a highly sensitive light intensity sensor, allowing for accurate detection of the current indoor light intensity. Based on the individual's identified working mode, the system will intelligently select the ideal light intensity and seamlessly adjust the brightness of the desk lamp to ensure that the measured light intensity falls within the specified range.

In addition, the integration of facial recognition technology and a PIR sensor will enable personalized lightness variation, catering to the unique preferences and requirements of specific users. To provide users with comprehensive information and control, a frontend webpage will be developed, presenting an intuitive and informative dashboard that offers real-time updates on temperature and humidity conditions. The webpage will further provide environment-based suggestions to optimize the indoor environment, alongside an option for manual lightness adjustment to accommodate individual preferences. This interface will enable users to interact seamlessly with the system, granting them the flexibility to configure and customize various functions according to their specific needs and preferences.

Furthermore, leveraging advanced hardware components such as cameras, the system will harness the power of artificial intelligence to detect users' sitting postures. Should incorrect sitting postures or prolonged periods of immobility be detected, the system will issue timely reminders, promoting better ergonomic practices and reducing the risk of discomfort or potential health issues.