Activity 1: Switch Case implementation in Street Lamps

Introduction:

The **automated street lamp control system** is a modern solution designed to optimize the functioning of street lights by turning them **on** and **off** automatically based on the **ambient light conditions**.

Idea:

This system aims to The basic idea of the project is to control the switching of street lamps automatically according to the surrounding light conditions. A Light Dependent Resistor (LDR) is used as the main sensor. During the day, when sunlight is present, the resistance of the LDR is very low, so the controller keeps the lamp OFF. As the environment becomes dark at night, the resistance of the LDR increases, and once it crosses a set threshold, the controller activates a relay to switch the lamp ON.

Research:

energy-efficient "smart" systems that use LED technology, sensors (like IR and LDRs), and microcontrollers (such as Arduino and Raspberry Pi) to automatically adjust light intensity based on pedestrian and vehicle movement, ambient light levels, and weather conditions.

Analyse:

By this project we can conclude that we can save more energy and we can utilise this energy in other things and this can improve efficiency of lamps.

Build:

```
#include <stdio.h>

int main() {
    int lightSensor;
    // 0 = dark (night), 1 = bright (day)

    printf("Enter Light Sensor Value (0 = Dark, 1 =
Bright): ");
```

```
    scanf("%d", &lightSensor);

    if (lightSensor == 0) {
        printf("It is Dark → Street Lamp is ON\n");
    }
    else if (lightSensor == 1) {
        printf("It is Bright → Street Lamp is OFF\n");
    }
    else {
        printf("Invalid Input! Please enter 0 or 1.\n");
    }

    return 0;
}
```

Testing :

Case 1 : If bright

Enter Light Sensor Value (0 = Dark, 1 = Bright): 1

It is Bright → Street Lamp is OFF

Case 2 : If dark

Enter Light Sensor Value (0 = Dark, 1 = Bright): 0

It is Dark → Street Lamp is ON

Conclusion:

The automatic street lighting system is an efficient and modern solution for conserving energy, reducing human effort, and improving safety in public areas. By using sensors to detect changes in light intensity or motion, the lamps automatically turn on during darkness and switch off in daylight. This not only reduces electricity wastage but also ensures that streets remain well-lit at the right time, enhancing security and convenience for the public.

Implementation:

The code is posted on my github account