RAILWAY CROSSING

PRESENTATION
GROUP 1

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OVERVIEW

This railway crossing system focuses on emphasizing a real life scenario of traffic, that involve trains and tracks.

ITEM REQUIREMENT

This operation involve sensor that detects movement to control the flo of traffic and provide signals to indicate whether it's time to stop and regulate safety.

ESP 36(38PINS)

The ESP32 is popular in IoT projects for its built-in Wi-Fi, Bluetooth, and versatile GPIO pins that support digital I/O, analog input, PWM, and communication via UART, I2C, and SPI for connecting various sensors and modules

EXPANSION BOARD

An expansion board adds extra features (like sensors or connectivity) to an IoT device, enhancing its functionality.

MG90S

is a compact, metal-gear servo motor with 180° rotation, ideal for lightweight robotics and IoT tasks. It runs on 4.8–6V and is controlled via PWM.

LEDS LIGHT

are low-power lights used in electronics for indicators or signals, controlled by digital or PWM outputs.

BUZZER

is a small sound device used in electronics to produce beeps or alerts, typically controlled by a digital signal.

WIRE JUMPER

used to make quick, solderless connections between components on a breadboard or with microcontrollers like the ESP32.

RESISTOR

is a component that limits electrical current in a circuit, protecting devices and controlling voltage levels.

FLOWWORK

This process revolves around sensor receiving and sending signals to our indicator to signify whether drivers should stop or go on.

WORKFLOW

1. **Default State (Gate Open)**
   - The green LED is ON.
   - The red LED and buzzer are OFF.
   - The servo motor holds the popsicle stick barrier in the "open" (vertical) position.
   - The IR sensor is aimed across the "track," waiting to be triggered.

2. **Train Approaches (Gate Closing Sequence):**
   - The train breaks the beam of the IR sensor.
   - The system immediately turns the green LED OFF.
   - The red LED begins to blink, and the buzzer starts beeping for a short warning period (e.g., 3 seconds).
   - After the warning, the servo motor smoothly rotates 90 degrees to lower the barrier into the "closed" (horizontal) position
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WORKFLOW

3. **Train Passing (Gate Closed):**
   - While the IR sensor continues to detect the train, the barrier remains down.
   - The red LED stays solid ON, and the buzzer is silent (or stays on, your choice).

4. **Train has Passed (Gate Opening Sequence):**
   - The end of the train passes the IR sensor, and the beam is restored.
   - The system turns the red LED OFF.
   - The green LED turns ON.
   - The servo motor rotates back 90 degrees, lifting the barrier to the "open" position.
   - The system returns to the default state, ready for the next train.

BUDGET

Total cost was 11.47$, but our school was courteous enough to provide us with RGB LED(secretly borrowed)

LED LIGHTS
5.4%

jumper wire
16.1%

sensor
10.8%

ESP 32
53.8%

Expansion board
14%
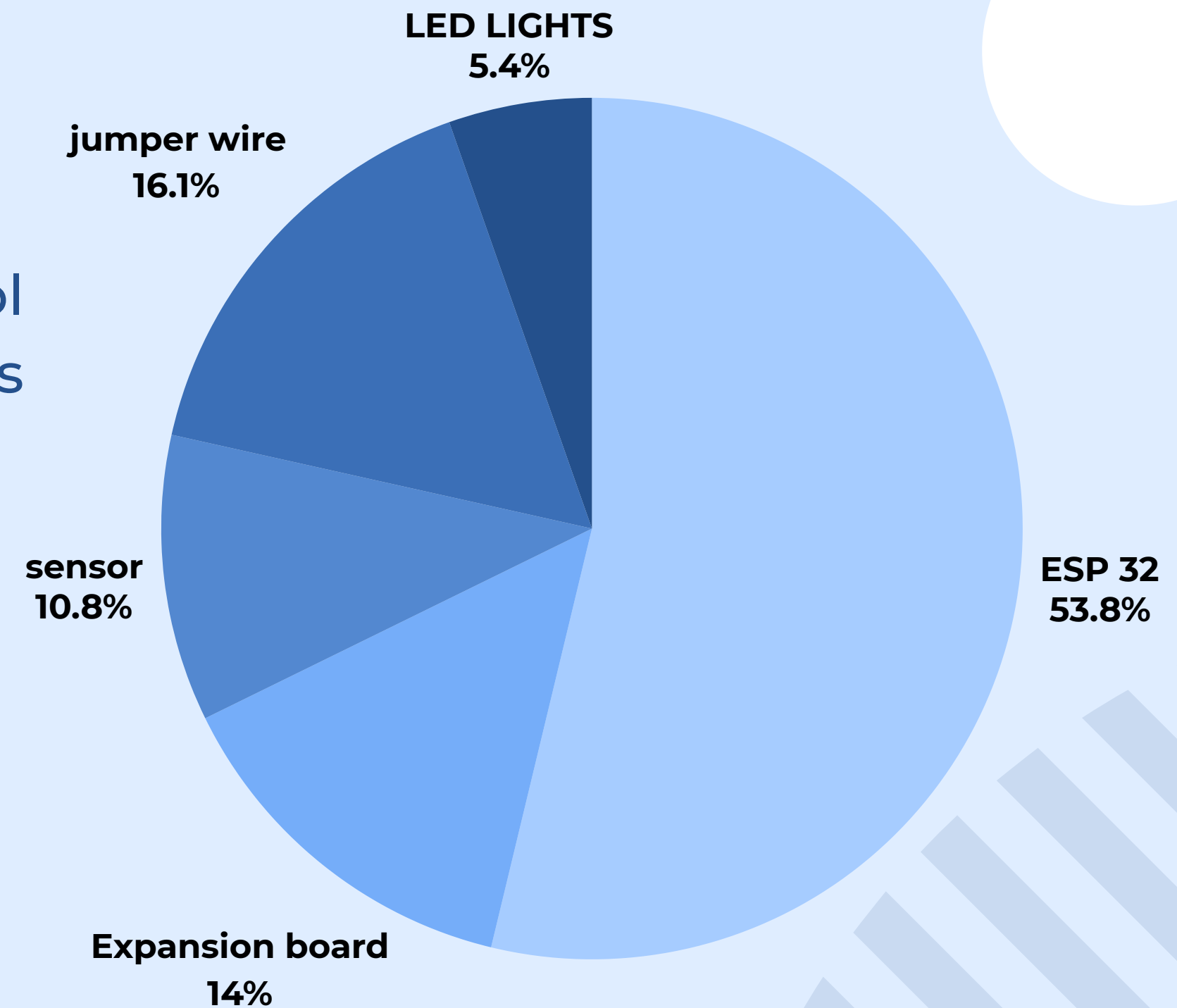
TEAM

- **Bong Satya** acting as grandmaster aka team leader
- **David** works as the treasury and slide designer
- **Bong Linna** acts as the board manager
- **Lysha** assisted with slides and is assistant of Bong Satya

Bong Satya

Linna

Savy David

Lysha