

GROUP-7

JOE PRESENTATION SMART WATER LEAKGE DETECTION SYSTEM

GROUP MEMBERS

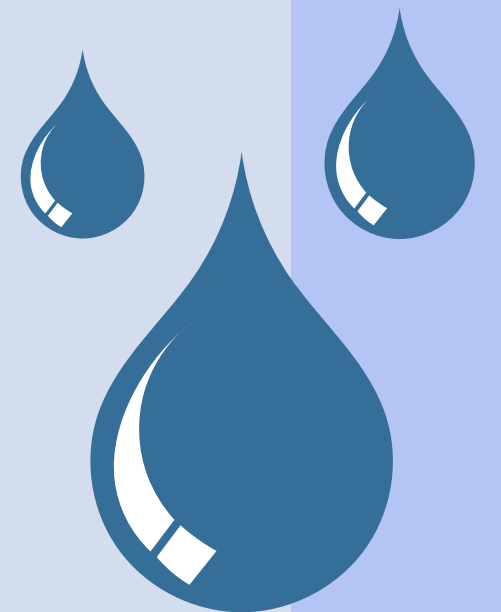
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INTRODUCTION & PROBLEM STATEMENT

Water leaks are a major problem, causing environmental and economic issues.

Existing methods often fail, leading to water losses and increased energy consumption.

Smart leak detection systems offer a sustainable solution.

PROBLEM STATEMENT

Manual leak detection in homes is slow, inconvenient, and often relies on visible signs of damage.

This results in undetected leaks, leading to higher water bills and potential property damage for homeowners: "Unattended leaks in homes lead to unsustainable water use and potential structural damage."

Long-term leaks can cause mold growth, structural damage, and health risks in homes.

There is an urgent need for better leak detection methods in residential properties.

OBJECTIVES

Objective 1: Level - Indicating Leakage Severity

- The system features an LED indicator system that provides a quick visual assessment of the leakage severity. The indicators are color-coded to represent different levels of leakage.
- A Yellow Light indicates moderate leakage, suggesting a need for inspection and potential repair.
- A Red Light signals severe leakage, indicating an urgent need for immediate action.

Objective 2: Time - Measuring Leakage Duration

- Another critical objective of the Smart Water Leakage System is to accurately measure the duration of a water leak event. This is achieved by continuously monitoring and logging the precise start and end times of any detected leakage.

Economic Viability of Our System

Cost Analysis

- Pipe cost: ₹60 per foot
- Leakage detection setup:
₹2.85 per foot
- Total per-foot cost: ₹62.85
- Detection system adds only
~4.75% extra per foot

Why It Matters:

- Highly cost-effective for long pipe networks
- Prevents major losses with minimal investment
- Scalable, affordable, and easy to implement

Hardware & Software Required

HARDWARE

- Arduino UNO
- Jumper wire
- 1K resistor
- Conduction Wire
- LEDs
- Breadboard
- Power Source

SOFTWARE

- Arduino IDE
- Serial Monitor

BreadBoard

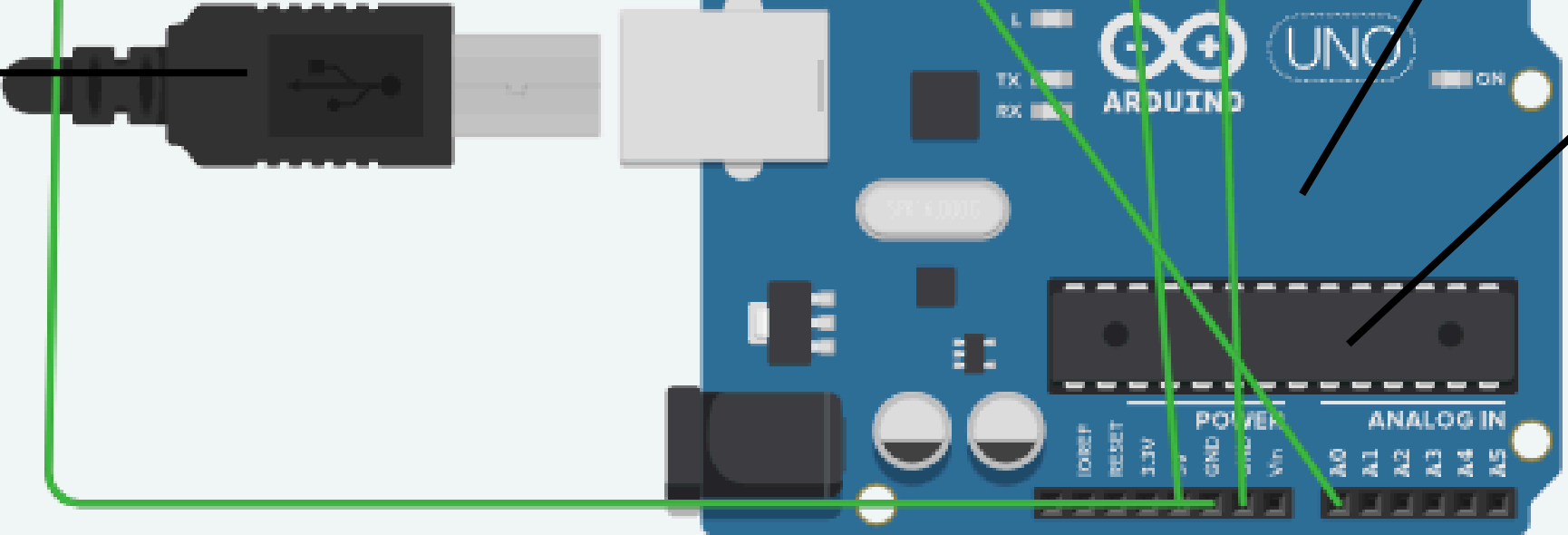
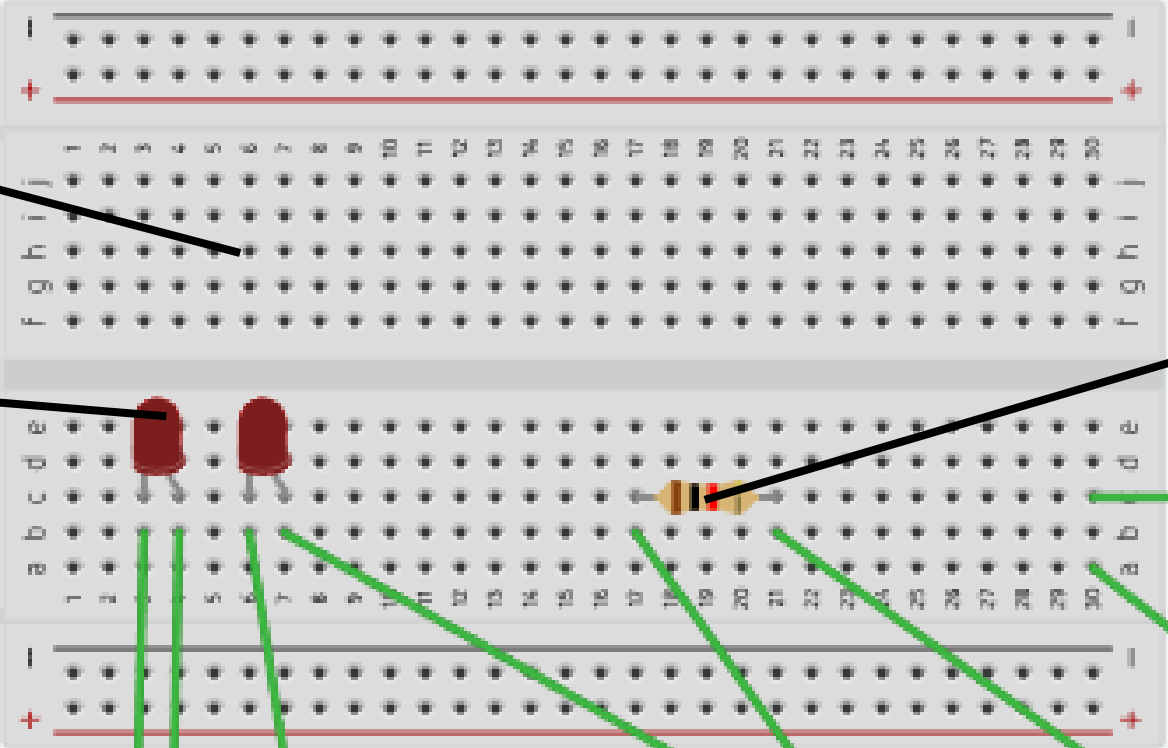
LED

Resistor(1Kohm)

Arduino

MicroController

USB



RATIONALE OF COMPONENTS

COMPONENTS USED	FUNCTION	COST (Rs)	VOLTAGE CONSUMPTION
ARDUINO	CONTROLS THE WHOLE SYSTEM	500	9V
BREADBOARD	COMPRISES OF ALL THE CONNECTIONS	100	-
WIRING	TO PASS THE COMMANDS	50	-
LED	INDICATES THE RESULT	2 TO 3	3V
RESISTOR	TO LOWER THE CURRENT	2-3	-

DELIVERABLES FOR END-TERM EVALUATION

SOFTWARE

We're using the Arduino Uno as our core platform to develop a smart leakage detection system. Its primary functions are:

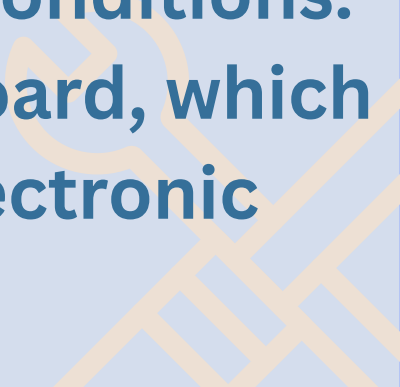
1. Time Tracking – It monitors and displays the duration of the leakage.
2. Leak Intensity Level – It indicates the frequency or severity of the leakage using LED indicators.

Want it to sound even more tech-savvy or tailored for a presentation or report?



HARDWARE

Our hardware setup will include two individual pipes, each serving a specific purpose within the system. On one of the pipes, we will carefully place a conductive wire along its surface. This wire will then be covered with a protective layer—most likely a moisture-resistant material—to ensure that it is shielded from any external environmental factors such as humidity or accidental splashes. This setup is designed to ensure that the wire only responds to genuine internal leakage from the pipe, rather than being affected by outside conditions. The wire will be connected to a breadboard, which will act as the central hub for our electronic components.



FUTURE SCOPE

- Integration with mobile apps for real-time alerts and monitoring.
- Use of AI and Machine Learning for predictive leakage detection and pattern analysis.
- Expansion to industrial water systems.
- Automatic shut-off valves to prevent major water loss in case of severe leaks.

THANK YOU