Project Proposal

CSEL-3208: Computer Peripheral & Interfacing Project (IOT)

Presented by- **"Team Prefetch"**

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Project title: Portable Ultrasonic Range Meter for Non-Contact Distance Measurement.

Problem statement: Accurate and portable distance measurement is essential in various applications, such as robotics, industrial automation, and environmental monitoring. This project addresses the need for a cost-effective and portable solution for non-contact distance measurement.

Objective: The objective of this project is to design and implement a Portable Ultrasonic Range Meter based on Arduino and an Ultrasonic Sensor (HC-SR04). The system should be capable of accurately measuring distances in a non-contact fashion and displaying the results on a 16x2 LCD display. The primary goals include:

- Develop a compact and portable distance measurement device.
- Implement a user-friendly interface for real-time distance display.
- Achieve precise distance measurements with a range of 2cm to 400cm.
- Ensure low power consumption for extended battery life.
- Utilize the Arduino platform for ease of development and versatility.

Features: The Portable Ultrasonic Range Meter project offers the following key features:

- Non-contact distance measurement using ultrasonic technology.
- Accurate measurements within the range of 2cm to 400cm.
- Real-time distance display on a 16x2 LCD screen.
- Compact and portable design, suitable for various applications.
- Low power consumption, allowing the use of a 9V battery.
- User-adjustable contrast control for the LCD display.
- Continuous distance measurement without delays.
- Easy-to-use interface for versatile applications.
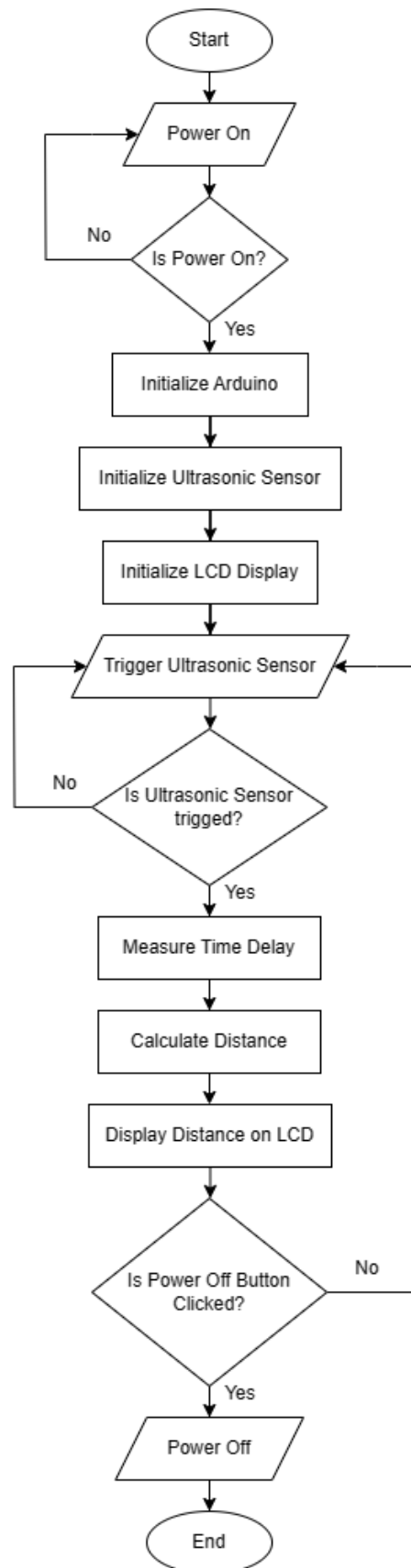
Workflow diagram:

Fig:2 Flow Chart of Portable Ultrasonic Range Meter for Non-Contact Distance Measurement.

Tools and devices:

- Arduino Uno microcontroller.
- Ultrasonic Sensor HC-SR04.
- 16x2 LCD Display.
- 10KΩ Potentiometer (POT).
- Breadboard and connecting wires.
- 9V battery or external power source.
- Connecting Wires
- Breadboard

References:

- "[Ultrasonic sensor based distance measurement](#)" - Arduino Project Hub
- "[HC-SR04 Ultrasonic Sensor User Guide](#)" – ElectroSchematics
- "[Arduino Official Website](#)" – Arduino
- "[Introduction to SONAR Technology](#)" – Britannica