**SRM Institute of Science and Technology**

**College of Engineering and Technology**

**SCHOOL OF COMPUTING**

**MINI PROJECT REPORT**

**ODD Semester: 2024-2025**

Lab code & Sub Name : 21CSS201T & Computer Organization and Architecture

Year & Semester : II & III

Project Title : Smart Dustbin

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| **Particulars** | **Max. Marks** | **Marks Obtained** |
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| Review 1 and 2 | 05 |  |
| Demo verification &viva | 03 |  |
| Project Report | 02 |  |
| **Total** | **10** |  |

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**SMART DUSTBIN**

**OBJECTIVE:**

The objectives of a smart dustbin include enabling hands-free operation for convenient waste disposal, allowing users to discard waste without physical contact. This feature significantly improves hygiene by reducing the risk of germ transmission, making it a safer option for public and personal spaces. The design encourages proper waste disposal habits, engaging users with its modern functionality.

**ABSTRACT:**

The Smart Dustbin project is designed for convenient waste disposal without the need for manual contact. It utilizes motion sensors to detect nearby users and automatically opens the lid, allowing for hands-free operation. This feature not only promotes hygiene by minimizing contact but also encourages proper waste disposal

Overall, this project seeks to promote sustainability and cleaner communities by transforming how we handle waste.

the lid opens when someone approaches, reducing the need for physical contact and minimizing the spread of germs. The design aims to encourage proper waste disposal while maintaining cleanliness by preventing odors and pest attraction. This innovative approach not only simplifies the waste disposal process but also promotes healthier living environments in homes, offices, and public spaces.

**INTRODUCTION:**

This project aims to create an innovative solution designed to enhance waste management while prioritizing convenience and hygiene. In today's fast-paced world, proper waste disposal is crucial for maintaining cleanliness and promoting healthy environments, whether at home, in offices, or in public spaces. Traditional dustbins often require physical contact, which can lead to the spread of germs and unpleasant odors.

Our automatic dustbin addresses these challenges by incorporating sensor technology that allows the lid to open hands-free, providing a seamless disposal experience. Throughout this presentation, we will explore the objectives of our project, the technology behind it, its benefits, and potential applications. We believe that this smart waste disposal system can significantly improve how we manage waste, fostering healthier and cleaner communities.

**HARDWARE/SOFTWARE REQUIREMENTS:**

1. Arduino Uno
2. Servo Motor – TowerPro micro servo SG90
3. Ultrasonic sensor – HC SR – 04
4. Jumper Wires
5. Dustbin with a lid

**CONCEPTS/WORKING PRINCIPLE:**

The Automatic Lid Opening Dustbin operates using a combination of sensor technology and an automated lid mechanism. Here’s a step-by-step overview of its working principle:

1. **Sensor Activation:** The dustbin is equipped with sensors, typically infrared or ultrasonic, that detect the presence of a user approaching the bin. These sensors continuously monitor the area around the dustbin.
2. **Lid Opening Mechanism:** Once the sensors detect a user within a specified range, they send a signal to a microcontroller or motor control circuit. This signal activates the motor mechanism connected to the dustbin lid.
3. **Automatic Lid Opening:** The motor mechanism opens the lid automatically, allowing the user to dispose of waste without needing to touch the bin. This hands-free operation promotes hygiene by minimizing contact.
4. **Lid Closure:** After a short delay, the sensors confirm that the user has moved away from the dustbin. The microcontroller then activates the motor again to close the lid automatically, ensuring the bin remains covered and helps control odors and pests.
5. **Power Supply:** The dustbin can be powered by batteries or an AC power source, ensuring reliable operation. Some designs may also include energy-efficient features to prolong battery life.

Through this automated process, the Automatic Lid Opening Dustbin enhances user convenience, promotes cleanliness, and supports effective waste management in various settings.

**APPROACH/METHODOLOGY/PROGRAMS:**

1. **Design and Component Selection: Research existing designs and select appropriate sensors (ultrasonic or infrared), a microcontroller (like Arduino), and a motor mechanism.**
2. **Circuit and Programming: Develop the circuit schematic and write the control program to manage sensor input and motor operation for the lid.**
3. **Assembly and Testing: Assemble the components into the dustbin casing, then test the system for functionality and user feedback.**
4. **Documentation: Create a user manual and a project report summarizing the design process and testing outcomes.**

**OUTPUT:**

The output of the Smart Dustbin

project is a hands-free waste disposal system that opens its lid automatically when a user approaches, enhancing hygiene by minimizing contact. This design promotes responsible waste disposal and contributes to a cleaner environment.

**CONCLUSION:**

The Smart Dustbin project effectively combines technology and convenience to improve waste disposal practices. By automating the lid operation, it enhances hygiene and encourages responsible waste management. The potential for real-time monitoring and future enhancements further solidifies its value as a modern solution. Overall, this innovative dustbin contributes to cleaner and healthier communities while addressing contemporary waste management challenges.

**REFERENCES:**

[**https://projecthub.arduino.cc/angadiameya007/80b6afcd-c92e-4214-abca-6c18921faaa8**](https://projecthub.arduino.cc/angadiameya007/80b6afcd-c92e-4214-abca-6c18921faaa8)