



A Project Report

on

IMPROVED SANITIZATION SYSTEM

Submitted in partial fulfillment of requirements for the award of the course

of

EGB1201-JAVA PROGRAMMING

Under the guidance of

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Assistant Professor / IT

Submitted By

MINU D

(927624BEC130)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

M.KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous)

KARUR – 639 113

DECEMBER 2025

M. KUMARASAMY COLLEGE OF ENGINEERING

(Autonomous Institution affiliated to Anna University, Chennai)

KARUR – 639 113

BONAFIDE CERTIFICATE

This is to certify that this project report on “**IMPROVED SANITIZATION SYSTEM**” is the bonafide work of **MINU D (927624BEC130)** who carried out the project work during the academic year 2025 - 2026 under my supervision.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION OF THE INSTITUTION

To emerge as a leader among the top institutions in the field of technical education

MISSION OF THE INSTITUTION

- Produce smart technocrats with empirical knowledge who can surmount the global challenges
- Create a diverse, fully-engaged, learner-centric campus environment to provide quality education to the students
- Maintain mutually beneficial partnerships with our alumni, industry, and Professional associations

DEPARTMENT VISION, MISSION, PEO, PO AND PSO

VISION

To empower the Electronics and Communication Engineering students with emerging technologies, professionalism, innovative research and social responsibility.

MISSION

- M1:** Attain the academic excellence through innovative teaching learning process, research areas & laboratories and Consultancy projects.
- M2:** Inculcate the students in problem solving and lifelong learning ability.
- M3:** Provide entrepreneurial skills and leadership qualities.
- M4:** Render the technical knowledge and skills of faculty members.

PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

- **PEO1:** Core Competence: Graduates will have a successful career in academia or industry associated with Electronics and Communication Engineering
- **PEO2:** Professionalism: Graduates will provide feasible solutions for the challenging problems through comprehensive research and innovation in the allied areas of Electronics and Communication Engineering.
- **PEO3:** Lifelong Learning: Graduates will contribute to the social needs through lifelong learning, practicing professional ethics and leadership quality.

PROGRAM OUTCOMES (POs)

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

- PSO1: Applying knowledge in various areas, like Electronics, Communications, Signal processing, VLSI, Embedded systems etc., in the design and implementation of Engineering application.
- PSO2: Able to solve complex problems in Electronics and Communication Engineering with analytical and managerial skills either independently or in team using latest hardware and software tools to fulfil the industrial expectations.

ACKNOWLEDGEMENT

We gratefully remember our beloved **Founder Chairman, (Late) Thiru. M. Kumarasamy**, whose vision and legacy laid the foundation for our education and inspired us to successfully complete this project.

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ABSTRACT

The Improved Sanitization System is a web-based application developed using Java, JSP, JDBC, and MySQL to digitalize and manage sanitation activities effectively. The main goal of this project is to maintain cleanliness and proper waste management through an organized online platform. It consists of six modules: User, Admin, Staff, Complaint Management, Waste Segregation, and Reports & Analytics. Users can register sanitation complaints by specifying the issue and location, while the admin monitors complaints, assigns tasks to staff, and tracks their progress. Staff members update task status upon completion, ensuring accountability. The system also includes waste segregation based on biodegradable and recyclable categories and provides analytical reports for performance tracking. By integrating Java concepts like ArrayList, HashMap, and JDBC connectivity, the system ensures efficient data handling and smooth operation. Overall, it contributes to improving hygiene standards and promoting a cleaner, smarter, and sustainable environment.

ABSTRACT WITH POs AND PSOs MAPPING

ABSTRACT	COs MAPPED	POs MAPPED	PSOs MAPPED
<p>The Improved Sanitization System is a web-based application developed using Java, JSP, JDBC, and MySQL to digitalize and manage sanitation activities effectively. The main goal of this project is to maintain cleanliness and proper waste management through an organized online platform. It consists of six modules: User, Admin, Staff, Complaint Management, Waste Segregation, and Reports & Analytics. Users can register sanitation complaints by specifying the issue and location, while the admin monitors complaints, assigns tasks to staff, and tracks their progress. Staff members update task status upon completion, ensuring accountability. The system also includes waste segregation based on biodegradable and recyclable categories and provides analytical reports for performance tracking. By integrating Java concepts like ArrayList, HashMap, and JDBC connectivity, the system ensures efficient data handling and smooth operation. Overall, it contributes to improving hygiene standards and promoting a cleaner, smarter, and sustainable environment.</p>	CO1	PO1	PSO1
	CO2	PO2	PSO2
	CO3	PO3	
	CO4	PO4	
	CO5	PO5	
		PO6	
		PO7	
		PO8	
		PO9	
		PO10	
		PO11	
		PO12	

Note: 1- Low, 2-Medium, 3- High

SUPERVISOR

HEAD OF THE DEPARTMENT

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CHAPTER 1

INTRODUCTION

1.1 OBJECTIVE

The main objective of the Improved Sanitization System is to develop a digital platform that helps in maintaining cleanliness and proper waste management by efficiently handling sanitation-related complaints, task assignments, and waste segregation. It aims to make the sanitation process more organized, transparent, and technology-driven by enabling users to report issues, allowing admins to monitor and assign tasks, and helping staff to update work status. This system ultimately seeks to promote hygiene, improve environmental quality, and support a sustainable and cleaner community.

1.2 OOPS CONCEPTS

The Improved Sanitization System is developed using Object-Oriented Programming (OOPs) concepts in Java, which help in creating a structured and efficient system. The key concepts used are Encapsulation, Inheritance, Polymorphism, and Abstraction. Encapsulation protects data by keeping it within specific classes and allowing controlled access. Inheritance helps in reusing code by sharing common features among classes like user, admin, and staff. Polymorphism allows the same function to perform different tasks depending on the object, and abstraction hides complex code from the user, showing only the required features. These concepts make the project easy to maintain, secure, and reusable.

1.3 LITERATURE SURVEY

From the literature survey, it is observed that most existing sanitation systems still depend on manual record keeping and physical monitoring, which leads to delays and lack of efficiency. Traditional systems do not provide real-time tracking of complaints or proper waste segregation management. To overcome these challenges, this project introduces a computerized sanitation management system that digitalizes complaint handling, staff assignment, and waste monitoring. The Improved Sanitization System ensures better time management, accuracy, and transparency compared to older manual methods, leading to a more hygienic and sustainable environment.

CHAPTER 2

PROJECT METHODOLOGY

2.1 PROPOSED WORK

- The system is developed to digitalize the sanitation process.
- Users can register complaints online with details like name, location, and issue.
- Admin can view, manage, and assign complaints to staff members.
- Staff can check assigned tasks and update their work status after completion.
- The system includes proper waste segregation — biodegradable, recyclable, and hazardous.
- Reports and analytics are generated to monitor performance and progress.
- The project uses Java, JSP, JDBC, and MySQL for implementation.
- The system helps improve cleanliness, save time, and ensure faster complaint resolution.
- It provides transparency and better coordination among users, admin, and staff.
- The main goal is to create a clean, efficient, and eco-friendly sanitation management system.

2.2 ARCHITECTURE

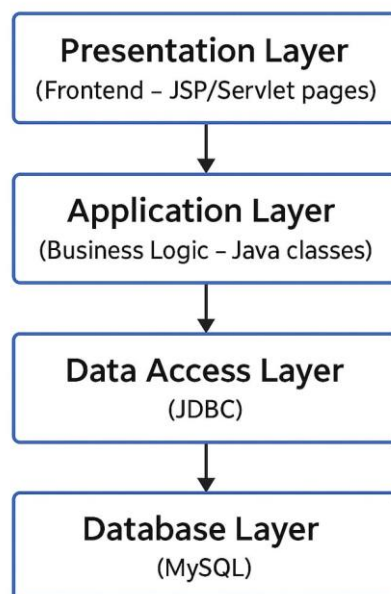


Fig.2.1.Architecture diagram

CHAPTER 3

MODULE DESCRIPTION

3.1 USER MODULE

The User Module allows users to register and log in to the system to report sanitation-related complaints. Users can submit details such as their name, location, and a brief description of the problem (for example, garbage overflow or unclean area). Once submitted, the complaint is stored in the database and assigned a status. Users can also track the progress of their complaints to know whether it is pending, in progress, or resolved. This module provides a simple and interactive interface to ensure that users can easily participate in maintaining cleanliness in their area.

3.2 ADMIN MODULE

The Admin Module acts as the central control of the system. The admin is responsible for managing users, staff, and complaints. Through this module, the admin can add or remove staff members, assign cleaning tasks, and monitor ongoing sanitation activities. The admin also has access to system analytics and reports that summarize the performance of staff and the overall cleanliness progress. This module plays a key role in ensuring coordination among users, staff, and the database.

3.3 STAFF MODULE

The Staff Module is designed for the sanitation workers or staff members who carry out the cleaning and maintenance tasks assigned by the admin. Each staff member can log in, view their assigned work, and update the task status after completion. This module helps staff manage their daily responsibilities efficiently and allows the admin to track work progress in real time. By digitalizing staff operations, the system ensures accountability and quick action on user complaints.

3.4 WASTE SEGREGATION & DISPOSAL MODULE

The Waste Segregation Module focuses on classifying waste into different types such as biodegradable, recyclable, and hazardous. This module helps promote proper waste disposal practices by storing and displaying segregation guidelines and methods. It educates users and staff on how to handle different kinds of waste and ensures that collection and disposal are done in an environmentally responsible way. This contributes to sustainability and reduces pollution.

3.5 COMPLAINT MANAGEMENT MODULE

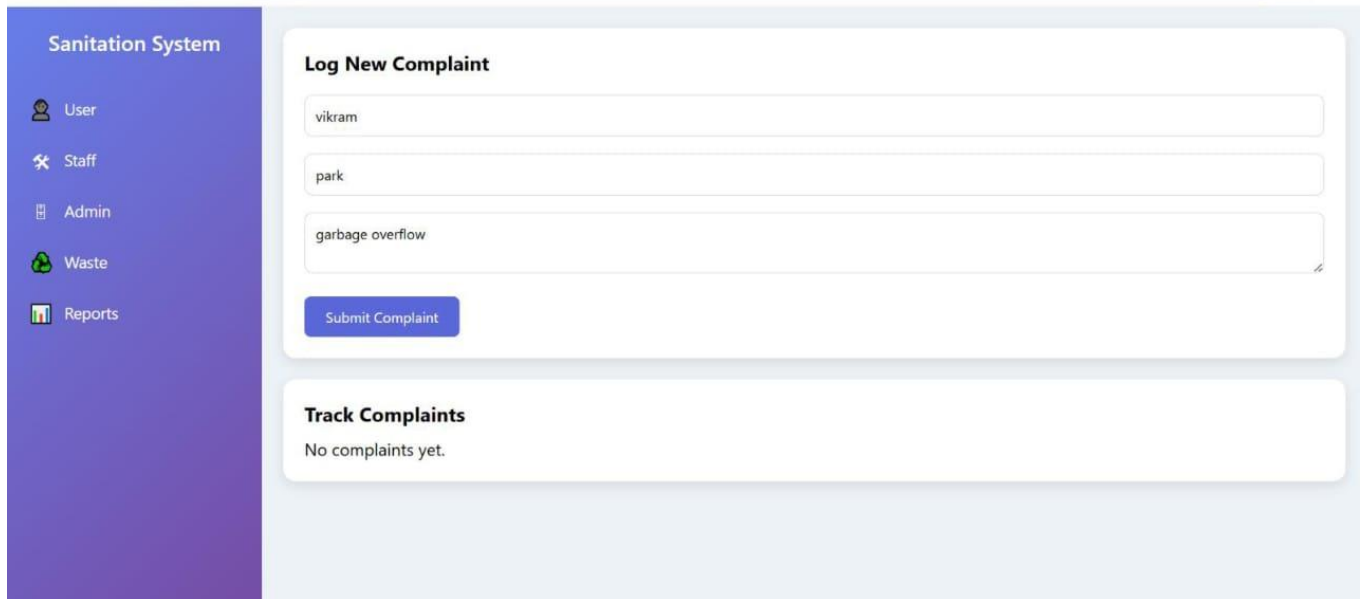
The Complaint Management Module is responsible for handling and monitoring all sanitation complaints raised by users. The admin can view the list of complaints, update their status, and assign them to staff members for resolution. Each complaint passes through different stages such as Pending, In Progress, and Resolved. This module ensures proper tracking of issues and timely action by the concerned staff. It also helps reduce delays and maintains transparency in the sanitation workflow.

3.6 REPORTS AND ANALYTICS MODULE

The Reports and Analytics Module provides summarized information about all activities in the system. It includes data such as the total number of users, complaints received, complaints resolved, and staff performance. The admin can use this data to analyze efficiency and make informed decisions for future improvements. This module helps in performance evaluation, monitoring sanitation operations, and ensuring continuous system improvement.

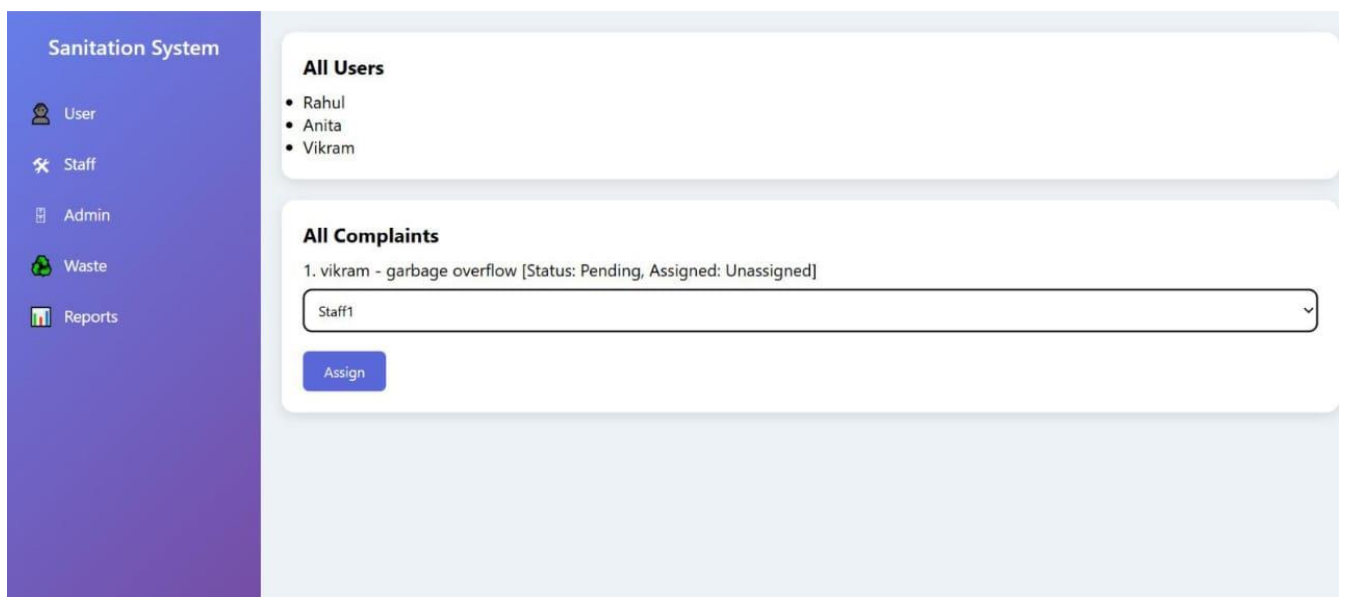
CHAPTER 4

RESULTS AND DISCUSSION



The screenshot displays the 'Sanitation System' web application interface. On the left is a purple sidebar with navigation links: User, Staff, Admin, Waste, and Reports. The main content area is white and contains two sections. The first section, 'Log New Complaint', has three input fields with the values 'vikram', 'park', and 'garbage overflow', followed by a blue 'Submit Complaint' button. The second section, 'Track Complaints', shows the message 'No complaints yet.'

Fig.4.1



The screenshot displays the 'Sanitation System' web application interface. On the left is a purple sidebar with navigation links: User, Staff, Admin, Waste, and Reports. The main content area is white and contains two sections. The first section, 'All Users', lists three users: Rahul, Anita, and Vikram. The second section, 'All Complaints', shows a list of complaints with the first one being '1. vikram - garbage overflow [Status: Pending, Assigned: Unassigned]'. Below this is a dropdown menu with 'Staff1' selected and a blue 'Assign' button.

Fig.4.2

Sanitation System

User

Staff

Admin

Waste

Reports

Assigned Complaints

1. garbage overflow [Status: Assigned, Assigned: Staff1]

Mark In Progress

Mark Completed

Add Waste Record

recyclable

2

Add Waste

Fig.4.3

Sanitation System

User

Staff

Admin

Waste

Reports

Waste Records

1. recyclable - 2kg
2. plastics - 1kg

Fig.4.4



Fig.4.5

The Improved Sanitation System efficiently manages sanitation issues through user, staff, admin, complaint, waste, and report modules. It allows users to log complaints, admins to assign tasks, and staff to update progress, ensuring quicker responses and better waste management. Overall, it improves cleanliness and promotes a smart, organized sanitation process.

CHAPTER 5

CONCLUSION

The Improved Sanitation System is a comprehensive digital platform designed to modernize and streamline the management of sanitation-related activities within a community or organization. The system effectively integrates multiple modules — including User, Staff, Admin, Complaint Management, Waste Management, and Reports & Analytics — to ensure seamless coordination among all stakeholders. Users can conveniently register sanitation complaints, track their status, and receive timely updates, reducing the need for manual reporting. The admin plays a central role by monitoring all registered complaints, assigning them to appropriate staff members, and ensuring that issues are resolved efficiently. Staff members can update the progress of assigned tasks, manage waste segregation and disposal activities, and maintain accurate data records for future reference.

Overall, the Improved Sanitation System enhances accountability, speeds up response times, and ensures better utilization of resources. It transforms the traditional sanitation process into a technology-driven model that is more efficient, reliable, and transparent. By promoting cleanliness and public hygiene, the system contributes to the creation of healthier and more sustainable communities.

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4. Medium, Developing a Smart Waste and Sanitation Management System Using Java and MySQL – <https://medium.com>
5. ResearchGate, IoT-Based Smart Sanitation and Waste Management System – <https://www.researchgate.net>
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APPENDIX

(Coding)

```
import java.util.*;

class Complaint {
    int id;
    String user;
    String location;
    String description;
    String status = "Pending";
    String assigned = "Unassigned";

    Complaint(int id, String user, String location, String description) {
        this.id = id;
        this.user = user;
        this.location = location;
        this.description = description;
    }
}

class WasteRecord {
    String type;
    double qty;

    WasteRecord(String type, double qty) {
        this.type = type;
        this.qty = qty;
    }
}

public class SanitationSystem {

    static Scanner sc = new Scanner(System.in);
    static List<Complaint> complaints = new ArrayList<>();
    static List<String> staff = Arrays.asList("Staff1", "Staff2");
    static List<WasteRecord> wasteRecords = new ArrayList<>();

    public static void main(String[] args) {

        while (true) {
            System.out.println("\n--- Sanitation System ---");
            System.out.println("1. User - Log Complaint");
            System.out.println("2. Staff - Update Complaint");
            System.out.println("3. Admin - Assign Staff");
            System.out.println("4. Waste Records");
            System.out.println("5. Reports");
            System.out.println("6. Exit");
            System.out.print("Choose option: ");
```

```
int choice = sc.nextInt();
sc.nextLine();

switch (choice) {
    case 1: userMenu(); break;
    case 2: staffMenu(); break;
    case 3: adminMenu(); break;
    case 4: wasteMenu(); break;
    case 5: reports(); break;
    case 6: System.exit(0);
}
}
}

// ----- USER -----
static void userMenu() {
    System.out.print("Enter Name: ");
    String name = sc.nextLine();

    System.out.print("Enter Location: ");
    String location = sc.nextLine();

    System.out.print("Describe Issue: ");
    String desc = sc.nextLine();

    complaints.add(new Complaint(complaints.size() + 1, name, location, desc));

    System.out.println("Complaint Submitted Successfully!");
}

// ----- STAFF -----
static void staffMenu() {
    System.out.println("\nAssigned Complaints:");
    for (Complaint c : complaints) {
        if (staff.contains(c.assigned)) {
            System.out.println(c.id + ". " + c.description + " | Status: " + c.status);
        }
    }
}

System.out.print("Enter Complaint ID to update: ");
int id = sc.nextInt();
sc.nextLine();

Complaint c = complaints.stream().filter(x -> x.id == id).findFirst().orElse(null);
if (c == null) {
    System.out.println("Invalid ID!");
    return;
}

System.out.println("1. Mark In Progress\n2. Mark Completed");
int opt = sc.nextInt();
sc.nextLine();
```

```
        if (opt == 1) c.status = "In Progress";
        else if (opt == 2) c.status = "Completed";

        System.out.println("Status Updated!");
    }

    // ----- ADMIN -----
    static void adminMenu() {
        System.out.println("\nAll Complaints:");
        for (Complaint c : complaints) {
            System.out.println(c.id + ". " + c.user + " - " + c.description + " | Assigned: " + c.assigned);
        }

        System.out.print("Enter Complaint ID to assign: ");
        int id = sc.nextInt();
        sc.nextLine();

        Complaint c = complaints.stream().filter(x -> x.id == id).findFirst().orElse(null);
        if (c == null) {
            System.out.println("Invalid ID!");
            return;
        }

        System.out.println("Choose Staff:");
        for (int i = 0; i < staff.size(); i++) {
            System.out.println((i + 1) + ". " + staff.get(i));
        }

        int s = sc.nextInt();
        sc.nextLine();

        c.assigned = staff.get(s - 1);
        c.status = "Assigned";

        System.out.println("Staff Assigned!");
    }

    // ----- WASTE -----
    static void wasteMenu() {
        System.out.print("Enter Waste Type: ");
        String type = sc.nextLine();

        System.out.print("Enter Quantity (kg): ");
        double qty = sc.nextDouble();
        sc.nextLine();

        wasteRecords.add(new WasteRecord(type, qty));

        System.out.println("Waste Record Added!");
    }

    // ----- REPORTS -----
```



```
static void reports() {  
    long completed = complaints.stream().filter(c -> c.status.equals("Completed")).count();  
    long pending = complaints.size() - completed;  
    double totalWaste = wasteRecords.stream().mapToDouble(w -> w.qty).sum();  
  
    System.out.println("\n--- Reports ---");  
    System.out.println("Total Complaints: " + complaints.size());  
    System.out.println("Pending Complaints: " + pending);  
    System.out.println("Completed Complaints: " + completed);  
    System.out.println("Total Waste Collected: " + totalWaste + " kg");  
}  
}
```