**Intelligent Waste Management System**

The Intelligent Waste Management System is designed to detect when a trash bin is full and automatically alert sanitation services for prompt pickup. This system integrates sensors, a microcontroller, and alert devices to streamline waste collection and prevent overflow.

**System Components**

**1. Input Components:**

* **Sensors:**  
  Sensors are used to detect the fill level of the trash bin. Once the trash reaches a predefined level, the sensor triggers the system.

**2. Processing Unit:**

* **Microcontroller:**  
  Acting as the brain of the system, the microcontroller processes input data from the sensors and determines whether the bin is full. It manages all interactions between the input and output components.

**3. Output Components:**

* **Alert Devices:**  
  When the trash bin is full, the system activates an alert mechanism. Each bin is linked to a specific alert device assigned to sanitation staff. The alert can include:
  + **GSM Module (SIM800L):** To send SMS alerts.
  + **Buzzing sound** to notify the sanitation crew.
  + **Alternative:** Bluetooth module (HC-05) for short-range notifications.

**Software Integration and Operation**

* The system operates using embedded software programmed into the microcontroller.
* When the sensor detects that the trash bin is full:
  + It sends a signal to the microcontroller.
  + The microcontroller triggers the alert device for the assigned sanitation staff.
* Each trash bin has a unique identifier to ensure targeted alerts and efficient service.

**Purpose and Benefits**

* **Prevent Overflow:**  
  Ensures trash bins are emptied promptly to prevent trash from spilling over and creating a mess.
* **Improved Sanitation Efficiency:**  
  Enables sanitation services to quickly identify and address full bins, reducing response time.
* **Enhanced Hygiene:**  
  Helps maintain a clean environment by discouraging people from placing trash in already full bins.

The Intelligent Waste Management System promotes cleaner spaces and efficient waste management through innovative technology.

SCHEMATIC DIAGRAM: