

SDA

MID LAB

GUL-E-NARJIS

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5-21-2025

## PATTERN AND PRINCIPLE USED:

**Selected Business Use Case:**

### Detect Noise

**Design Pattern Used:**

### Observer Pattern

**Why?**

In the system, different types of sensors (e.g., noise sensors) act as observers. When a noise sensor detects a sound above a certain threshold, it **notifies the Monitoring System**, which then **notifies the parent/guardian**.

So, the Observer Pattern is perfect here because:

- Sensors act as *subjects*
- Monitoring system acts as *observer*
- Real-time notification is triggered on events

**Design Principle Used:**

### Separation of Concerns (SoC)

**Why?**

The system is divided into layers:

1. **Sensor Layer** → Detects input (e.g., noise)
2. **Processing Layer** → Analyzes and decides whether it's dangerous
3. **Notification Layer** → Sends alerts to stakeholders (parents)

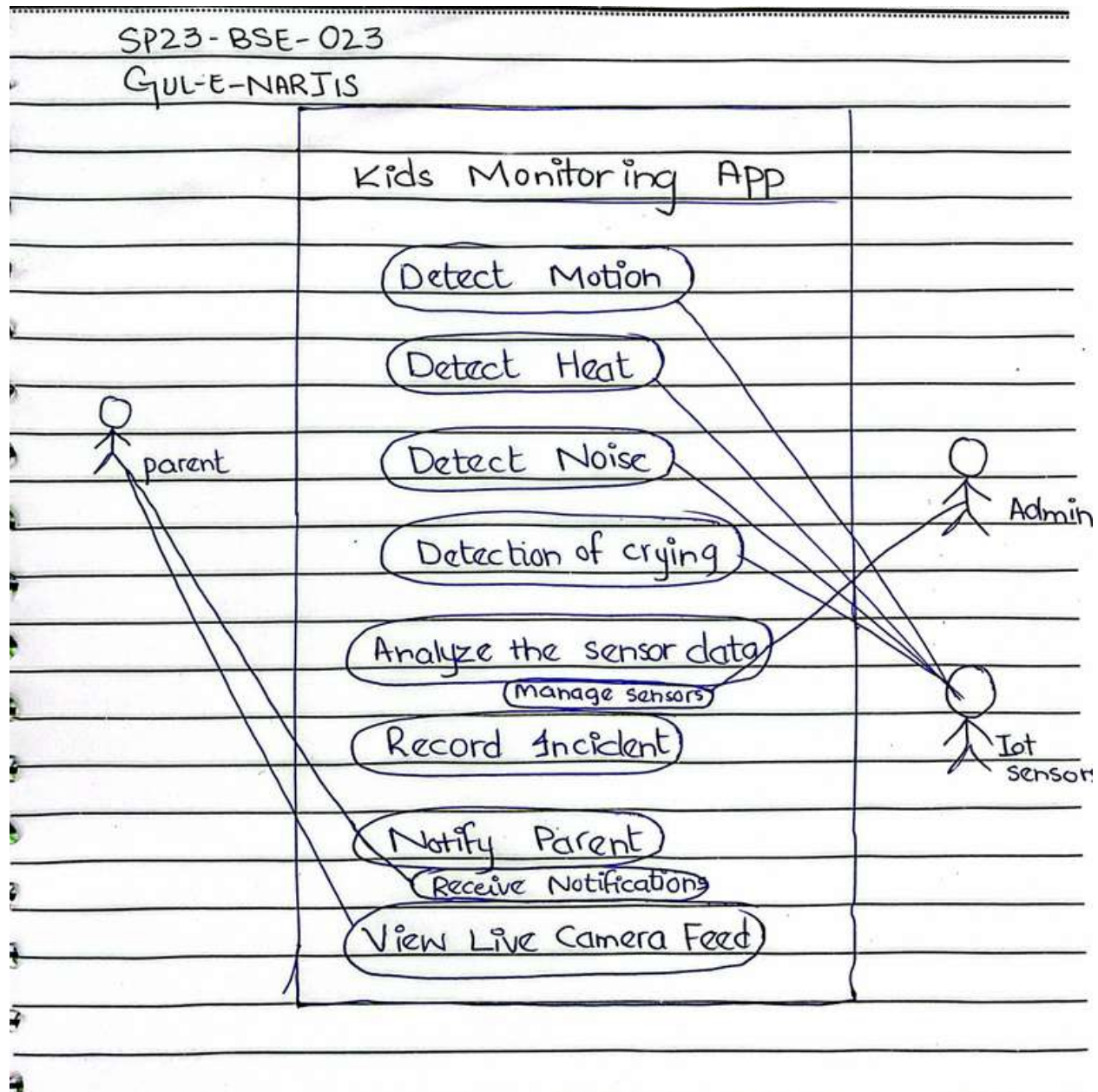
**Final Answer:**

**Selected Use Case:** Detect Dangerous Noise

**Design Pattern:** Observer Pattern – to notify the monitoring system whenever the sensor detects noise.

**Design Principle:** Separation of Concerns – separate responsibilities for detection, processing, and notification for better maintainability and modularity.

## USE CASE DIAGRAM:



## COMMUNICATION DIAGRAM:

## Communication Diagram :- "Detect Noise"

