

ALERT GENERATOR SYSTEM UML CLASS DIAGRAM

This UML Class Diagram for the “Alert Generation System” includes a design for monitoring patient health metrics and generating alerts when these metrics exceed predefined thresholds. This design adheres to principles of modularity, separation of concerns, and scalability. It’s structured around three main components: alert, thresholds, and data generation.

Modularity and Separation of Concerns

To avoid tight coupling, The system is designed with distinct classes, each responsible for specific functionality, stuck to the Single Responsibility Principle (SRP). This makes the system more maintainable and robust.

Data Generation

The “PatientDataGenerator” interface abstracts the data generation process, allowing different implementations to be used interchangeably. This promotes flexibility, scalability and reliability, enabling the system to adapt to various data sources and methods without altering core logic.

Alert Generation and Management

The “AlertGenerator” class is the core component. To connect this class with the thresholds ,(MetricThresholds and MetricThresholdsConnected), new methods were implemented:

- retrieveMetrics(): Fetches current health metrics from the data source.
- retrieveThresholds(): Retrieves predefined threshold values.
- checkMetricsAgainstThresholds(): Compares metrics against thresholds to determine alert importance.

AlertManager: Handles and manages alerts generated by the “AlertGenerator”. Ensures timely delivery to medical staff.

Threshold Management

The “PatientThresholds” class stores threshold values for each patient and provides methods to set and retrieve these thresholds and check if a value is above the threshold. This class aggregates “MetricThresholds” and “MetricThresholdsConnected”, allowing efficient management of complex configurations.

Alert Representation

The “Alert” class encapsulates details about an alert, including the patient ID, condition, and timestamp. This ensures that alert information is consistently formatted and accessible, facilitating effective communication and response to health incidents.

Conclusion

The UML class diagram for the Alert Generation System provides a comprehensive view of monitoring patient health metrics and generating alerts. By ensuring modularity, separation of concerns, and scalability, the system enhances robustness, flexibility, and maintainability, making it an effective solution for timely health monitoring.