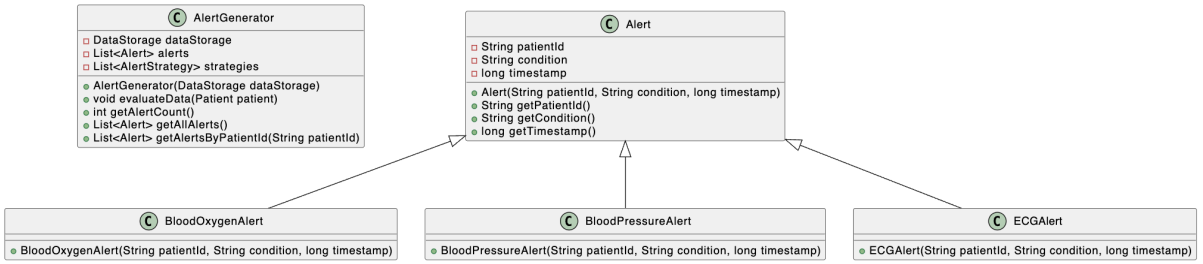
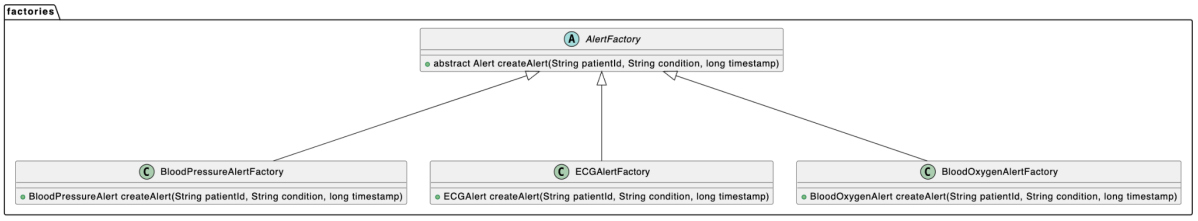
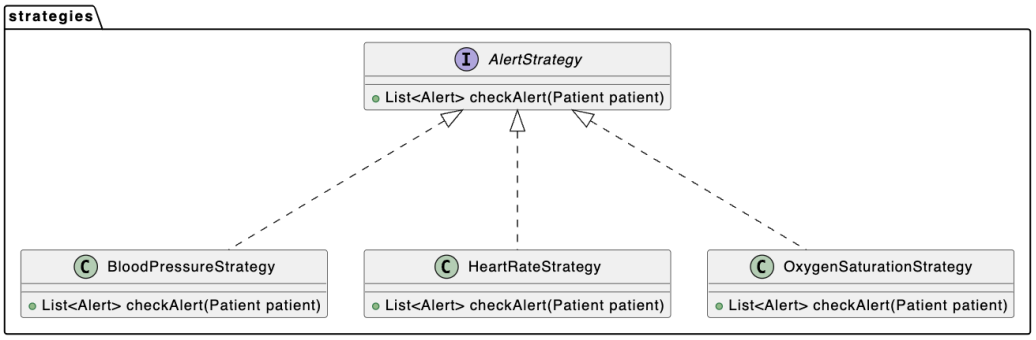
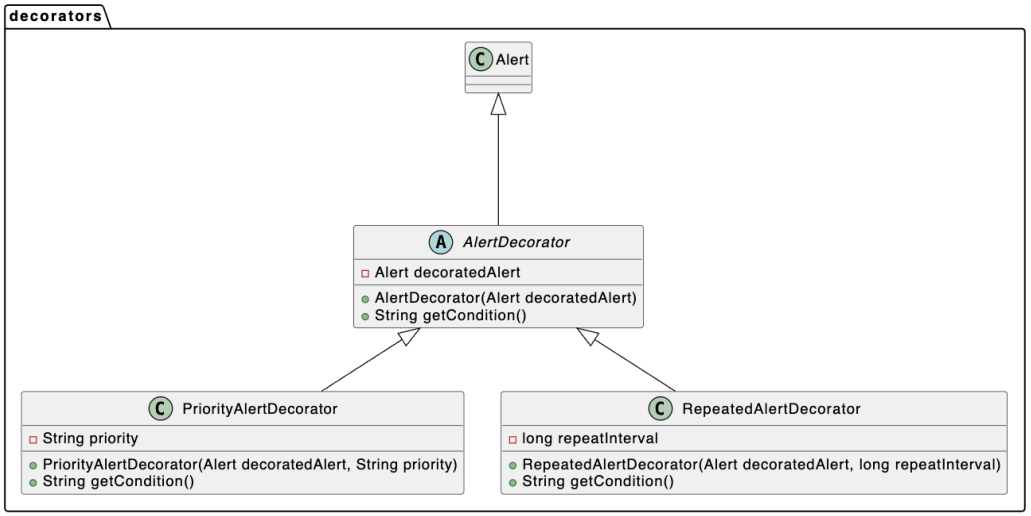
Alert System









The alert system in this project is designed to monitor patient health data and generate alerts based on predefined strategies. Below is a detailed description of the system, explaining the various classes and their relationships within the com.alerts package.

The system is organized into several packages, each with a specific responsibility. The primary package of interest is com.alerts, which contains classes related to the creation and management of alerts. The sub-packages decorators, strategies, and factories further define specific functionalities related to alerts.

The main class is Alert, which represents an alert with basic information such as patientId, condition, and timestamp. It has methods for initializing an alert and retrieving its properties. AlertGenerator is responsible for generating alerts based on patient data. It maintains a list of alerts and alert strategies, with methods for evaluating patient data, retrieving the alert count, and getting alerts by patient ID. Subclasses like BloodOxygenAlert, BloodPressureAlert, and ECGAlert extend the Alert class to represent specific types of alerts, each with constructors to initialize the alert with specific details.

The decorators package includes classes for adding additional functionalities to alerts. The AlertDecorator abstract class extends Alert and acts as a base for other decorators, containing a reference to an Alert object and overriding the getCondition method. PriorityAlertDecorator adds a priority level to an alert, while RepeatedAlertDecorator adds a repeat interval. Both have constructors to initialize these properties and methods to return the decorated alert condition.

The strategies package defines different strategies for generating alerts. The AlertStrategy interface specifies a method for checking patient data and returning a list of alerts. Implementations include BloodPressureStrategy, HeartRateStrategy, and OxygenSaturationStrategy, each defining specific criteria for generating alerts based on blood pressure, heart rate, and oxygen saturation levels.

The factories package includes abstract factory classes for creating alerts. AlertFactory defines an abstract method for creating an alert, and concrete factories like BloodPressureAlertFactory, ECGAlertFactory, and BloodOxygenAlertFactory extend it to create specific types of alerts.