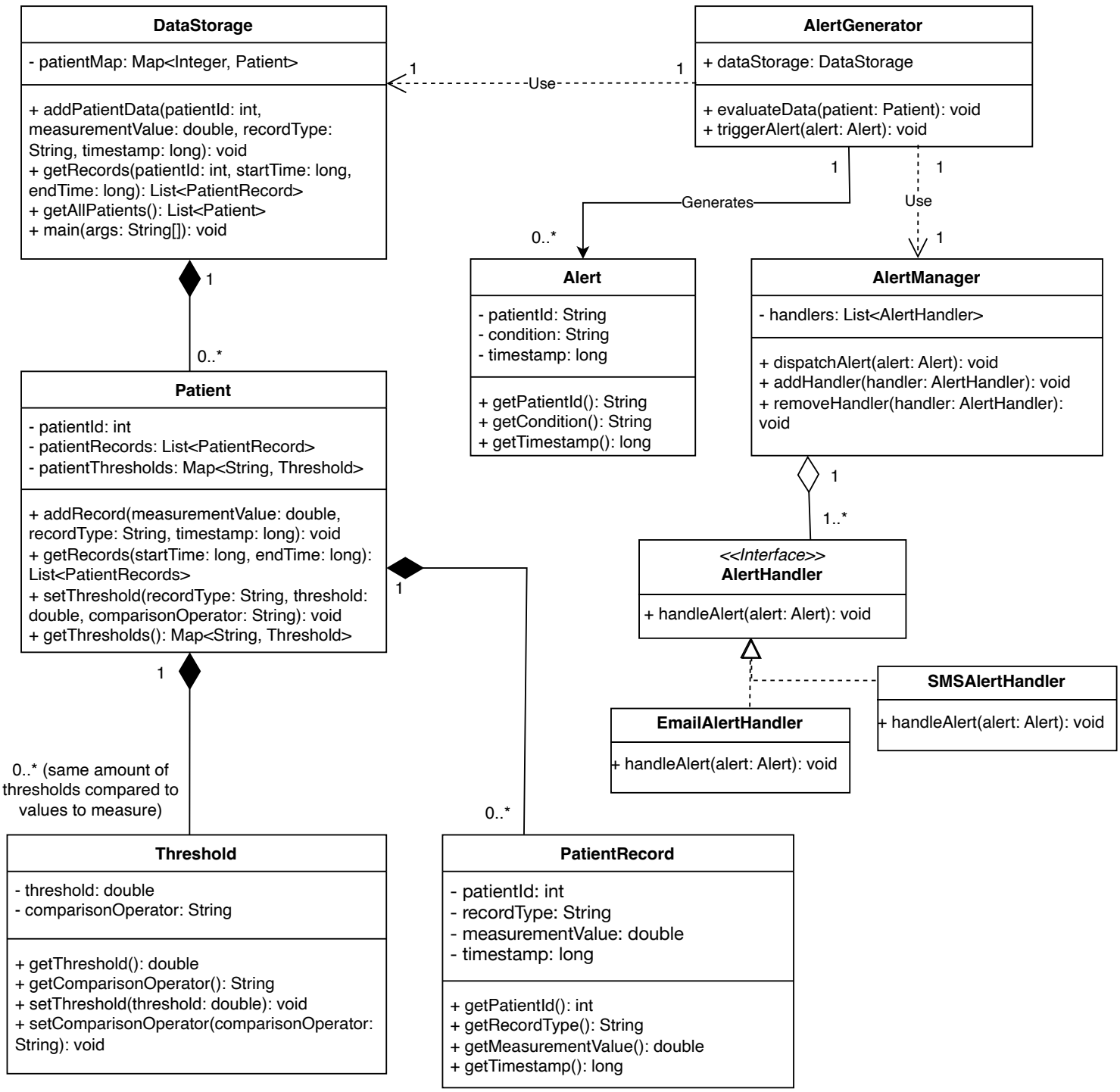
UML Class Diagram of Alert Generation System



Explanation of the UML Class Diagram for the Alert Generation System

The Alert Generation System is responsible for evaluating whether patient data exceeds personalized threshold. If data exceeds personalized threshold values, the Alert Generation System is responsible for triggering and dispatching alerts to medical staff.
The central class, AlertGenerator, retrieves patient data via the DataStorage class. This data includes patient-specific information, such as vitals and threshold values. Each Patient object contains multiple PatientRecord entries representing time-stamped data, as well as an associated Threshold object that defines the threshold values for that individual patient's vitals (e.g., heart rate, blood pressure).
The AlertGenerator evaluates this data in real time. If a vital value exceeds the corresponding threshold, the AlertGenerator creates an Alert object. This object contains details such as the patient ID, the condition that triggered the alert, and a timestamp.
Once an alert is generated, it is passed to the AlertManager, which is responsible for dispatching it through appropriate channels. The AlertManager uses a collection of AlertHandler objects. Each handler represents a method of notification (e.g., SMS, Email). Both SMSAlertHandler and EmailAlertHandler implement the AlertHandler interface. This use of polymorphism ensures that new alert types can be added easily without modifying the core logic of the AlertManager, thereby promoting extensibility and maintainability in the system.