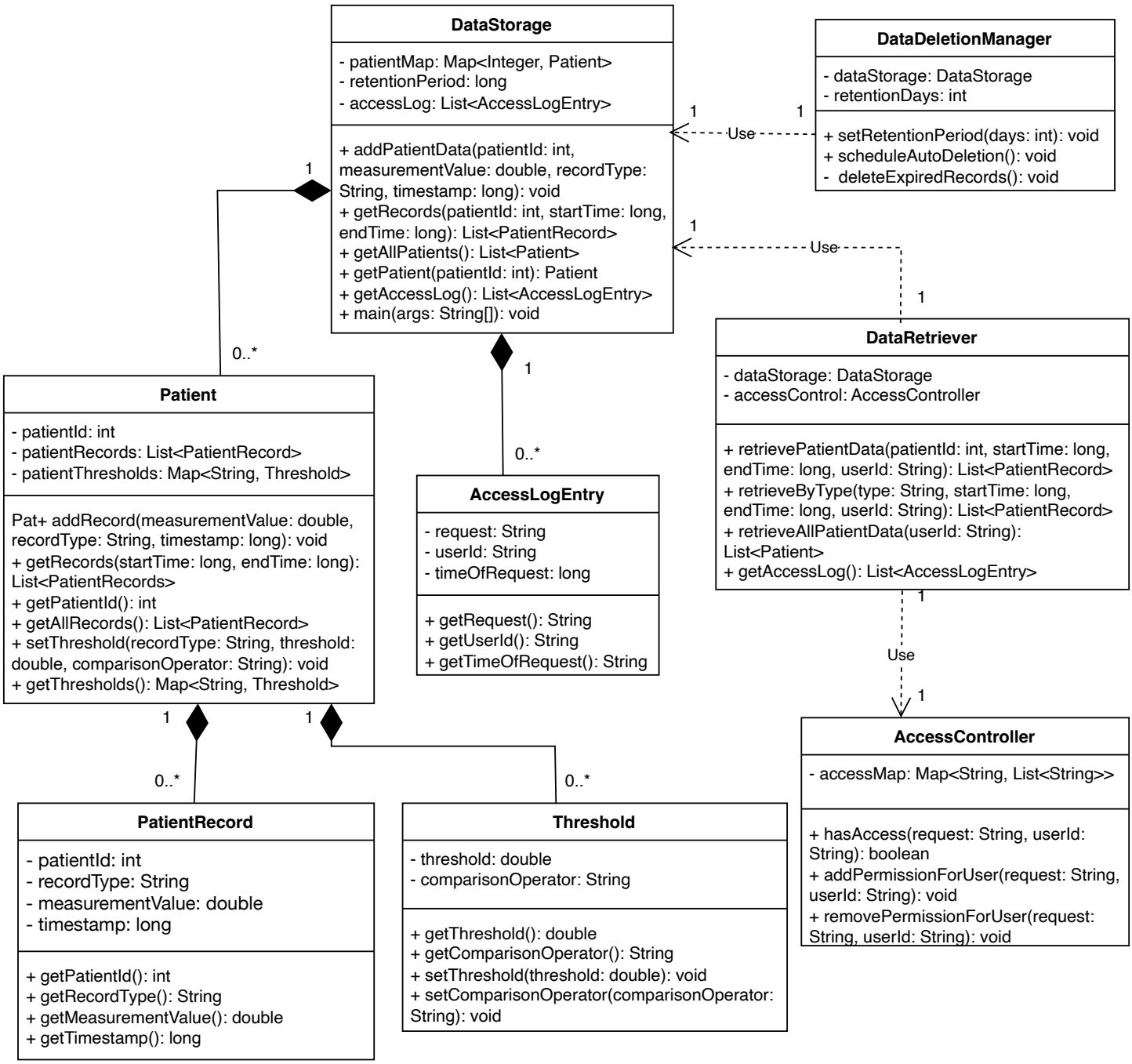
UML class Diagram for the Data Storage System



Explanation of the UML Class Diagram for the Data Storage System

The Data Storage System is designed to securely store and manage patient health data while ensuring appropriate access control and data lifecycle management. The `DataStorage` class serves as the central repository for all patient data. It has a composition relationship with `Patient` objects through a Map structure. This design ensures that patient data has a clear owner and cannot exist independently of the storage system. This enhances data integrity.

Each `Patient` maintains a collection of `PatientRecord` objects that contain individual measurements, and `Threshold` objects that contain individual threshold values. These composition relationships ensure records and thresholds are always associated with a specific patient and are automatically removed if the patient is deleted.

Data management responsibilities are distributed across specialized classes. The `DataRetriever` class handles data requests made by staff members. The `AccessController` class is used by the `DataRetriever` class to check whether the request can be accepted based on the user ID of the staff member who made the request.

The `AccessController` class contains a Map with the keys being the types of requests, and the values being Lists of users who have permission to make these specific types of requests. This ensures that data access must pass through permission checks. Furthermore, every access attempt is logged by creating a new `AccessLogEntry` object and adding this to a List that contains all the loggings of access attempts that are ever made within this specific Data Storage System. This List of loggings is stored in the `DataStorage` class, but can also be accessed by the `DataRetriever` class.

The `DataDeletionManager` class automatically removes expired records. After a specified number of days, expired records get removed from the `DataStorage` class.