**HealthMate AI: Proxy Design Pattern**

The Proxy Design Pattern plays a crucial role in HealthMate AI, ensuring secure and controlled access to health data while promoting flexibility, maintainability, and compliance.

* The Proxy Design Pattern is employed within HealthMate AI to regulate access to sensitive health data and safeguard its integrity.
* It introduces a protective layer between the HealthMate AI client and the actual health data access implementation.

Key Elements

* Client: The HealthMate AI application itself, utilizing the proxy for data interactions.
* Proxy: The HealthDataProxy class assumes the role of a controlled gateway to health data.
  + Implements the HealthDataAccess interface, mirroring the real subject's methods.
  + Acts as a gatekeeper, verifying access permissions before forwarding requests.
  + Can perform additional actions like logging, caching, or remote data access management.
* Real Subject: The HealthDataAccessImpl class encapsulates the actual data access logic.
  + Implements the HealthDataAccess interface, carrying out data retrieval or modification.
  + Remains shielded from direct client interaction.

Interactions

1. Client initiates a data request: Calls a method on the HealthDataProxy, unaware of the real subject's existence.
2. Proxy validates access: Verifies permissions before proceeding.
3. Authorized access:
   * Proxy forwards the request to the real subject for execution.
   * Real subject performs the requested operation and returns results back to the proxy.
4. Proxy handles the response:
   * May conduct post-processing or validation.
   * Returns the results to the client, maintaining transparency.
5. Unauthorized access: Proxy blocks the request, returning an error or exception.