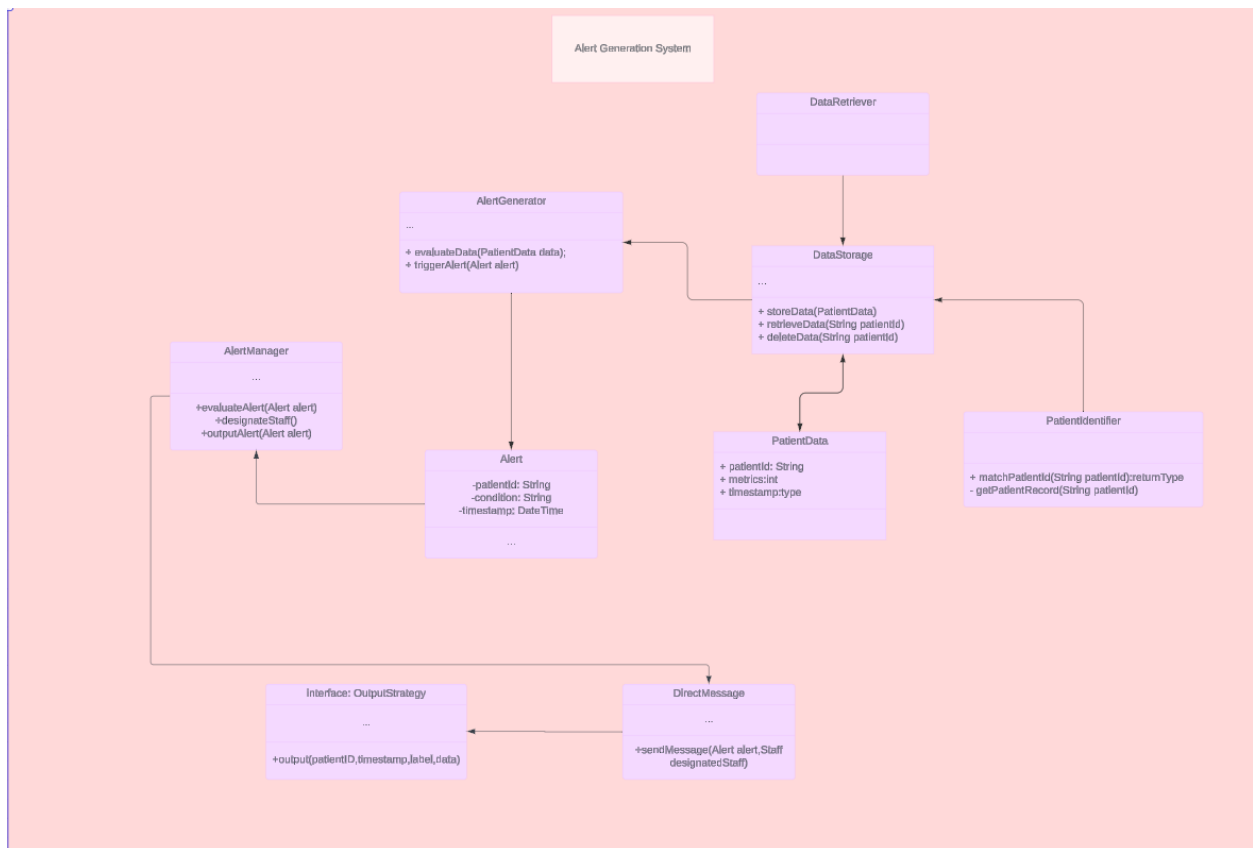# SE Project tasks week 2

## _Task 1:_



The Alert Generation System is a meticulously designed framework aimed at swiftly identifying and addressing potential patient issues. It functions seamlessly by first retrieving real-time patient data through the data retriever module and securely storing it using the data storage component. This data, along with essential patient identifiers, is then transmitted to the Alert Generator for thorough analysis.

Upon receiving the data, the alert generator meticulously evaluates it for any irregularities or concerning patterns. Should any anomalies be detected, the

system promptly triggers an alert, generating a comprehensive alert object that encapsulates crucial details such as the patient's ID, the nature of the condition, and the timestamp of the event.

Subsequently, the alert is seamlessly forwarded to the alert manager, which assumes the critical role of conducting a detailed assessment based on the entirety of the patient's data. Through this thorough evaluation, the alert manager discerns between transient fluctuations and genuine patient concerns, employing predefined criteria to make accurate judgements.

In situations where the patient's well-being is deemed to be at risk, the alert manager swiftly identifies and assigns the appropriate staff members. This selection process takes into account various factors, including the availability of staff scheduled to be present in the patient's ward or those assigned specific duties aligned with the timestamp of the alert.

Once the designated staff members are identified, they are promptly notified via the direct message class, which adheres to the output strategy interface. This ensures that pertinent staff receive immediate notification, providing them with essential details regarding the alert and the associated patient. This streamlined process facilitates prompt intervention and ensures the delivery of optimal care to the patient in need.

Rationale:

When i read the scenario and how the alert generation system implemented itself in the scenario this is how i thought out of how it should work, i might have missed certain steps or certain classes but this is how i envisioned the system to work.
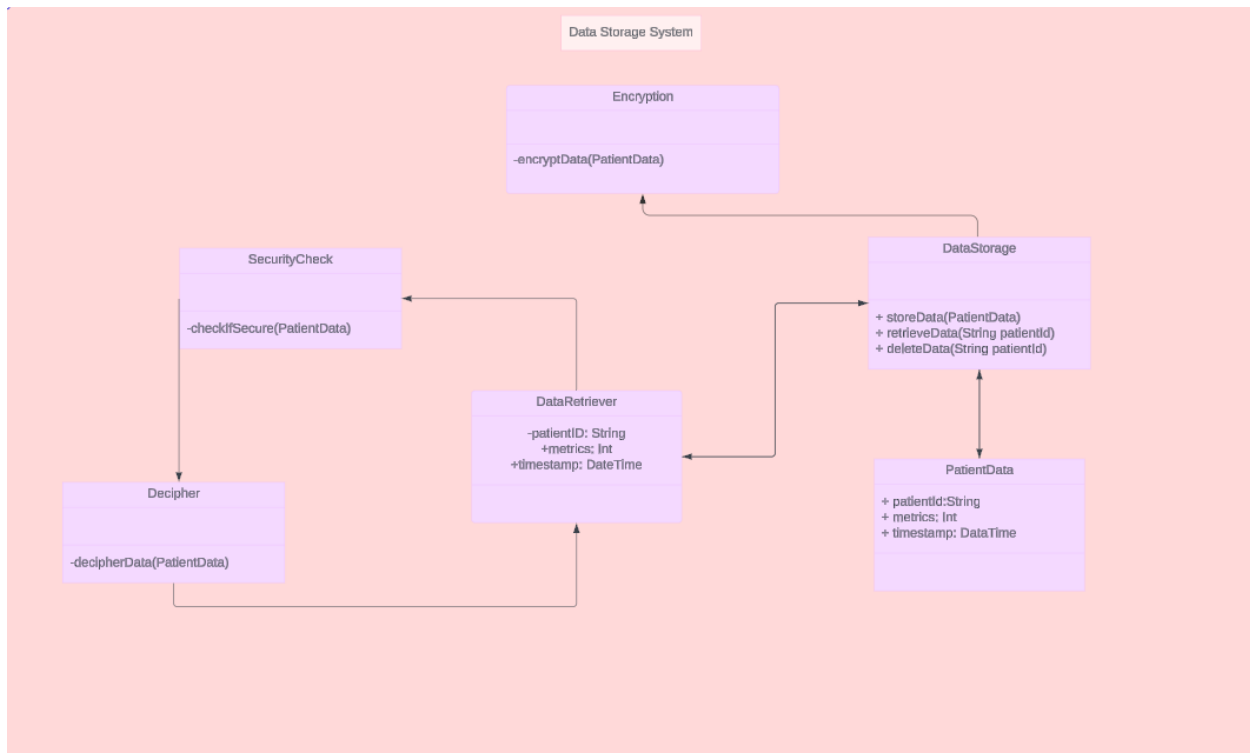
Data Storage System:

The data storage system works by using the data storage class to store patient data received by the patient, and then using the encryption class, the stored data is encrypted for patient confidentiality. As such, the data stored is unusable for any third parties trying to breach the system and gain data about patients, for example, journalists trying to gain information about famous people, their medical states, etc.

Then, when a staff member wants to retrieve the data of a patient, they must call the data retriever class, which then activates the following steps: In most medical systems, the staff member must pass a security check, which is typically a login with a username and password interface. Once confirmed that the person is permitted to view the patient data, the data is run through an decipher class, which deciphers the previously encrypted code into a format that is readable and understandable to the staff member.

The data storage system operates through a meticulously designed process aimed at safeguarding patient information. It begins with the utilization of the data

storage class to securely retain patient data obtained during their interactions with the healthcare system. Subsequently, employing the encryption class ensures that this stored data is rendered indecipherable to unauthorized entities, thereby upholding patient confidentiality and mitigating the risk of breaches. This security measure prevents any third-party attempts to infiltrate the system and access sensitive information, such as journalists seeking details on the medical conditions of notable individuals.

When authorized staff members necessitate access to patient data, they initiate the data retrieval process by engaging the data retriever class. This triggers a sequence of actions wherein the staff member undergoes a stringent security verification process, typically involving a username and password authentication. Upon successful verification, the encrypted data undergoes decryption via the decipher class, transforming it into a comprehensible format accessible to the staff member, facilitating informed decision-making and patient care. This robust system ensures both the integrity of patient data and adherence to privacy regulations, thereby fostering trust in the healthcare ecosystem.


Rationale:

Same as the alert generation system, my brain has brought me to envision that the data storage system should look as such.
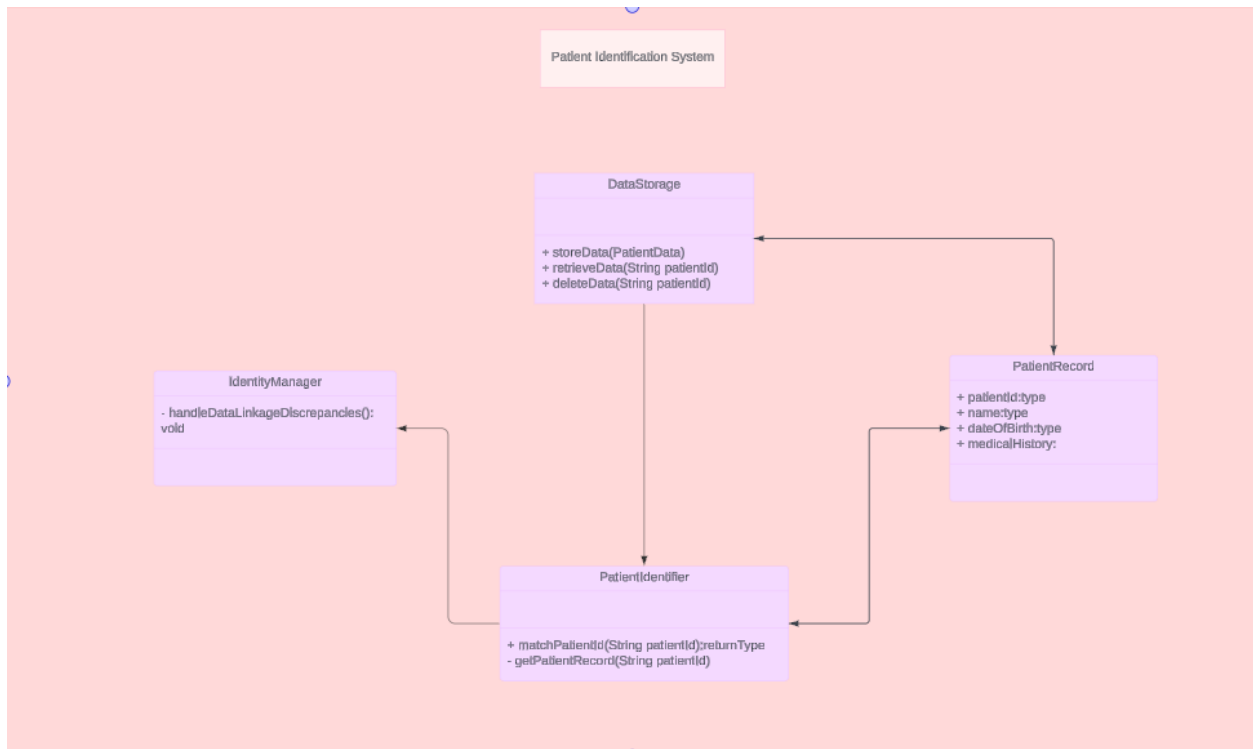
**Patient Identification System:**

The Patient Identification System comprises several interconnected classes designed to efficiently manage patient records across multiple healthcare facilities. At its core are the Data Storage and Patient Record classes, which collaborate to securely store and organise patient data. This centralised repository ensures that patient records are readily accessible to authorised entities, including other hospitals, through a standardised format.

The Patient Identifier class serves as the gateway for accessing patient records. By leveraging patient identifiers, this class retrieves the relevant records and matches them with the corresponding patient ID, facilitating seamless information retrieval and interoperability between healthcare institutions.

Crucially, the Identity Manager class plays a pivotal role in resolving data linkage discrepancies that may arise. Through sophisticated algorithms and data reconciliation techniques, the identity manager ensures the accuracy and consistency of patient information, thereby mitigating the risk of errors or duplications.

This interconnected system offers several benefits for a medical system. Firstly, it streamlines the process of accessing patient records, enabling healthcare professionals to make informed decisions based on comprehensive and up-to-date information. Secondly, it promotes interoperability between healthcare facilities, allowing for seamless continuity of care and reducing administrative burdens associated with manual data exchange. Overall, the Patient Identification System enhances efficiency, accuracy, and patient outcomes within the medical ecosystem.

Rationale:

Honestly, i was quite confused about this system, this is probably the best i can make it.
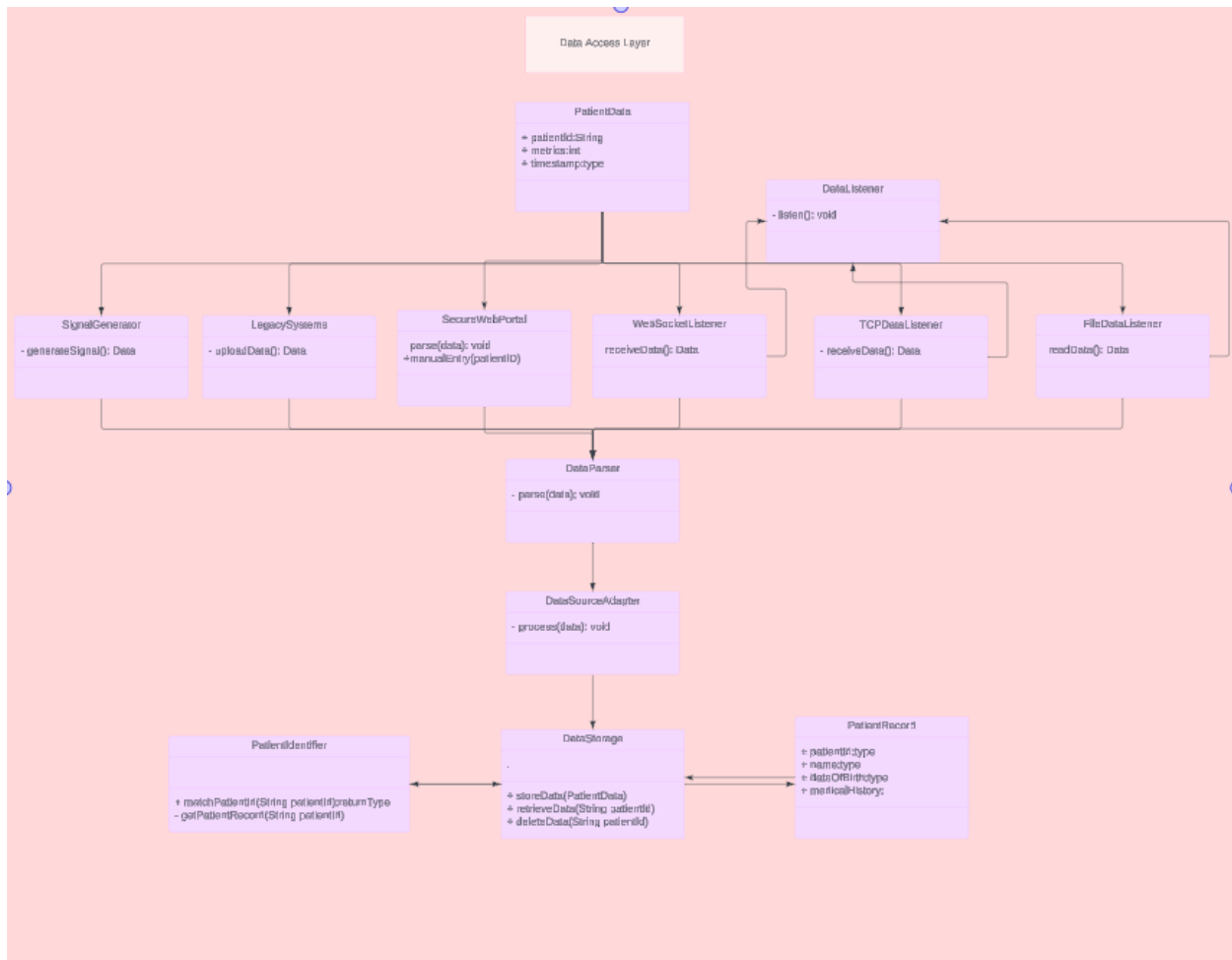
Data - Access Layer:

The Data Access Layer (DAL) system orchestrates the seamless integration of patient data from diverse sources into the Cardiovascular Health Monitoring System, ensuring accuracy, reliability, and flexibility. At its core are the Data Listener classes, tailored to various data sources such as TCP/IP, WebSocket, and file-based inputs. Each Data Listener subclass, including TCP Data Listener, WebSocket Data Listener, and File Data Listener, receives raw data streams according to its respective protocol.

Upon receiving data, the Data Listener delegated parsing responsibilities to the Data Parser class, which standardised the incoming data into a uniform format. This standardised data is then handed off to the Data Source Adapter, which processes it further before interfacing with the Data Storage System for persistence.
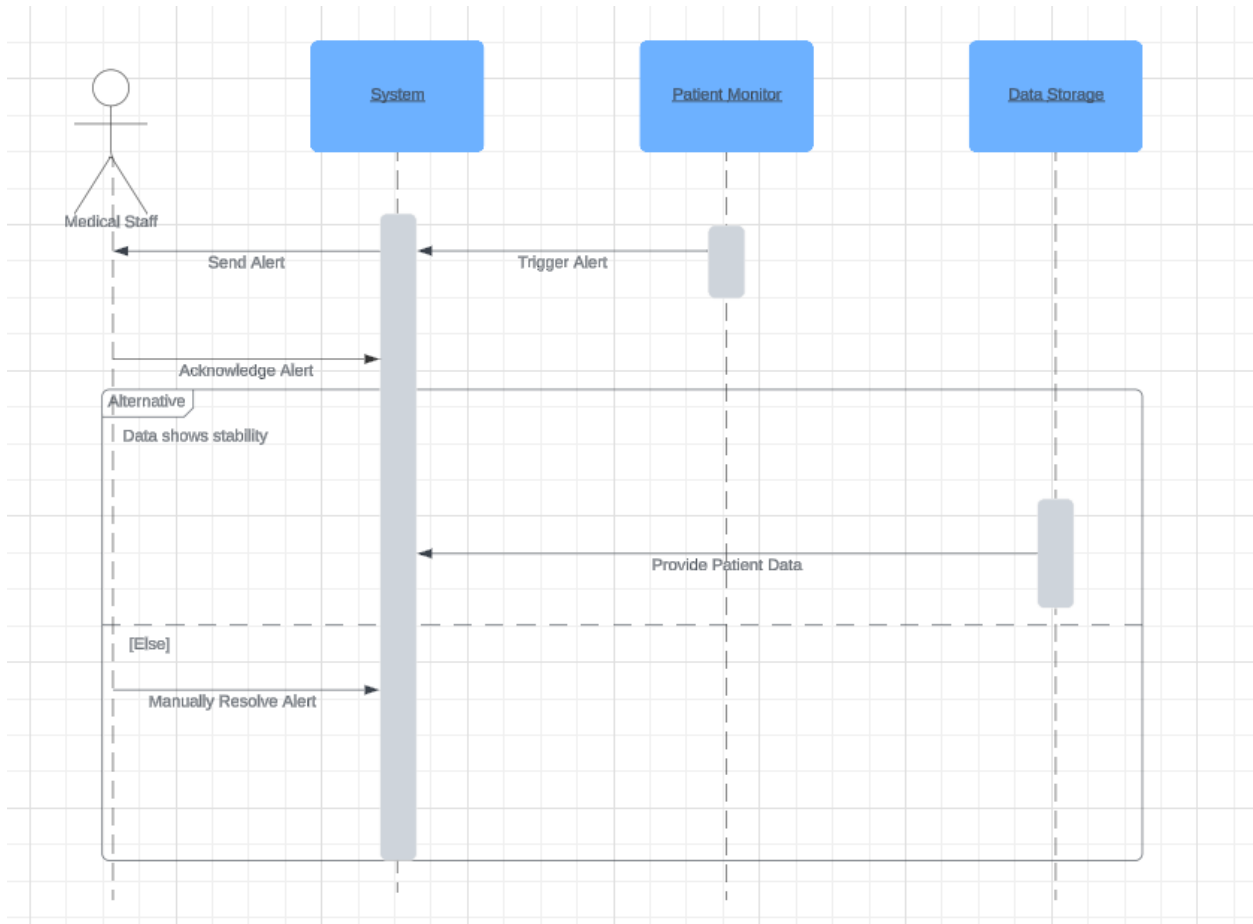
This modular architecture offers several benefits for the medical system. Firstly, it ensures compatibility with a wide array of data sources, facilitating the integration of real-time patient data streams from disparate sources. Secondly, the standardised data format simplifies data handling and processing, enhancing system reliability and efficiency. Finally, the flexibility of the DAL allows for seamless adaptation to evolving data sources and communication protocols, ensuring the scalability and longevity of the Cardiovascular Health Monitoring System in dynamic healthcare environments. Overall, the DAL system plays a pivotal role in enabling the system to operate independently from its data sources while maintaining robustness and adaptability in the face of changing requirements.

Rationale:

This seems correct to me because it encompasses a hierarchy between the classes and the connection between them which is why i decided on this format of diagram.


# *Task 2:*

## Sequence Diagram:



## State Diagram: